BABBITT'S
Patent Soft Metal Lined Boxes,
FOR
AXLES, GUDGEONS, ETC.

PATENTED JULY 17, 1839.

PATENT EXTENDED FOR SEVEN YEARS
FROM JULY 17, 1853.

PATENT, PETITION, AFFIDAVITS, ETC.

Results of Suits, Opinion of Counsel, etc.

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ATTORNEY, AND SOLE AGENT.

WILLIAM WHITING, Esq., BOSTON,

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PATENT RIGHT.

No. 1252.

THE UNITED STATES OF AMERICA.

To all to whom these Letters Patent shall come.

WHEREAS, ISAAC BABBITT, of Boston, Massachusetts, has alleged that he has invented a new and useful improvement in the mode of making Boxes for Axles and Gudgeons, which he states has not been known or used before his application; has made oath that he is a citizen of the United States; that he does verily believe that he is the original and first inventor or discoverer of the said improvement, and that the same hath not, to the best of his knowledge and belief, been previously known or used; has paid into the treasury of the United States, the sum of thirty dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said improvement, and praying that a patent may be granted for that purpose.

These are, therefore, to grant, according to law, to the said Isaac Babbitt, his heirs, administrators, or assigns, for the term of fourteen years from the seventeenth day of

July, one thousand eight hundred and thirty-nine, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement; a description whereof is given in the words of the said Isaac Babbitt, in the schedule hereunto annexed, and is made a part of these presents.

IN TESTIMONY WHEREOF, I have caused these Letters to be made Patent, and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the City of Washington, this seventeenth day of July, in the year of our Lord one thousand eight hundred and thirty-nine, and of the Independence of the United States of America, the sixty-fourth.

JOHN FORSYTH,

Secretary of State.

HENRY L. ELLSWORTH,

Commissioner of Patents.

Countersigned and Sealed with the Seal
of the Patent Office.

Fig. 1.

Fig. 2.

Fig. 3.

The Schedule referred to in these Letters Patent, and making part of the same.

TO ALL TO WHOM IT MAY CONCERN. Be it known, that I, Isaac Babbitt, of the city of Boston, in the State of Massachusetts, have invented a new and improved mode of making or constructing the boxes within which the gudgeons, or journals for machinery in general, and the axles of railroad cars, locomotive engines, and other cars and carriages, are to run; by which mode of constructing or making such boxes or bearings, the heating and abrasion which is apt to occur under the ordinary mode of constructing them, are prevented, and their durability is consequently increased. And I do hereby declare, that the following is a full and exact description thereof.

I prepare boxes which are to be received into housings, or plummer-blocks, in the ordinary way of forming such boxes, making them of any kind of metal, or metallic compound, which has sufficient strength, and which is capable of being tinned. The inner parts of these boxes are to be lined with any of the harder kinds of composition, known under the name of Britannia metal, or pewter, of which block-tin is the basis. An excellent compound for this purpose, I have prepared, by taking about fifty parts of tin, five of antimony, and one of copper: but I do not intend to confine myself to this particular composition. To prepare the boxes for the reception of this composition, I cast them with projecting rims along

their interior edges and on their ends, within the semi-cylindrical part, which is to receive the axle or gudgeon. I then tin the inner surface of said boxes, and the ledges or rims above named, in order to cause the metallic composition, with which they are to be lined or cased, to adhere to them.

Fig. 1, in the accompanying drawing, is a perspective view of one of these boxes; fig. 2, is a cross; and fig. 3, a longitudinal section through it. *a a*, in figs. 1 and 3, are the ledges or rims along the edges; and *b b*, those around the ends of said box. The use of these is to hold the metallic lining firmly in its place, and prevent its spreading. The lining may be used, however, without such ledges or rims.

In finishing one of these boxes, I proceed in the following manner:

I coat the inside, including the rims, with tin, in the well-known manner of performing that operation. I then take a cylindrical, or semi-cylindrical former, of the exact size in its cylindrical parts, of the gudgeon or axle which is to run within it. And upon this axle, gudgeon, or former, I place my box in such manner as that the axis of the axle or gudgeon, and of the curvature of the box, shall coincide, my box being of such size as that, when so placed, the projecting rims or ledges, shall not touch, but shall be nearly in contact with the gudgeon, or axle, say within the distance of from a sixteenth to a thirty-second part of an inch, more or less. I then close these spaces, by any suitable means, and it is then prepared to receive

the lining of composition metal, which is to be melted and poured in. For the purpose of pouring it in, there is a hole, *c*, left through the middle of the box, which, in those for railroads, may be an inch in diameter, and will, in all cases, be proportioned to the size of the box. The metal thus poured in, will take to the tinned surface of the interior of the box, and the surrounding rims or ledges, and will cover the edges of the latter, so as to prevent contact between them and the axles or gudgeons which they are to receive, whilst the ledges will effectually check any tendency in the metal to spread, from the weight and friction of the lead. When the ledges are not used, the coating of composition metal should be but thin.

Having thus fully described the nature of my improvement, and shown the manner in which I carry the same into operation, what I claim as my invention, and desire to secure by Letters Patent, is the making of the boxes for axles and gudgeons, in the manner above set forth, that is so say: by the casting of hard pewter, or composition metal, of which tin is the basis, into said boxes, they being first prepared and provided, [or not,] with rims or ledges, and coated with tin, as herein described and made known.

ISAAC BABBITT.

THOS. P. JONES, }
LINTON THORN, } *Witnesses.*

This Schedule contains a description of improvements annexed and added to Letters Patent granted to Isaac Babbitt, bearing date the seventeenth day of July, eighteen hundred and thirty-nine, and making part of the same.

BE IT KNOWN, that I, Isaac Babbitt, of Boston, in the State of Massachusetts, have made the following improvements in the "mode of making Boxes for Axles and Gudgeons;" for which boxes I obtained Letters Patent of the United States, dated the 17th day of July, 1839; and the improvements herein made known, are to be added to said Letters Patent, and to make a part thereof. And I hereby declare, that the following is a full and exact description of my said improvements.

In the accompanying drawing, fig. 4 is a perspective representation of one of my boxes, similar to that shown in fig. 1 in the drawing attached to the original patent; but with an improvement thereon.

Fig. 5 is a longitudinal section of the said improved box, corresponding with fig. 3 in the original drawing; in each of these figures, *a a* are the ledges or rims along the edges, and *b b*, those around the ends, for confining the metallic lining in place, and preventing its spreading, as in the original boxes; *c c*, is the hole for pouring in the metallic lining.

The improvement in this and similar boxes, consists in the providing or forming a rebate or recess, at the ends

Fig. 4

Fig. 5.

Fig. 6.

of such boxes, within which rebate, the composition metal, of the nature set forth in my original specification, is to be received, and by which it is to be confined, for the purpose of sustaining the end bearings of the shoulders of axles, or gudgeons, or of such other parts of the machinery which may run against them, or against which they may run, or bear. These rebates, or recesses, are shown at *d d*, outside of the ledges *b b*, around the ends of the boxes; and these are to be filled with the metallic composition, in the same operation in which the parts within the ledges *a a* and *b b* are filled.

This metallic lining, confined by rims or ledges, is not only applicable to boxes for axles or gudgeons, and for the journals of machinery in general, where boxes are divided, so as to form semi-cylinders, but it is equally applicable to boxes, or sockets, which are not divided, but form a continuous circle, or a socket which is square, or of any other form, and within which a rod or bar is to slide, as for example: for the guides of locomotives, and other engines; and it will also serve, perfectly well, as a metallic packing around the rods, or stems of valves, and of other parts of engines similarly employed; the same having been so used by me, and with perfect success.

Fig. 6 is a section through the socket or bushing of a pulley, or sheave, to be used in blocks on board of vessels, or elsewhere; *c c* are the ledges which are to confine the metallic lining represented by the solid lines *ff*; the projecting parts, *g g*, are the flanches of the bushing, which are to be let into the sheave, in the usual way.

The casting of the metal into the interior of these sockets, or bushes, or into the sockets of slides, will be effected in the same way as in other boxes or sockets. By the use of this metallic lining, and the employment of hard composition metal of copper and tin, or of analagous compounds, such as are commonly used for the casting of boxes, to form the pins, bolts, or gudgeons, upon which the sheaves are to run, in lieu of pins or gudgeons of iron; the injurious consequences frequently resulting from the oxidation of the iron, are obviated, such sheaves always turning freely upon their pins or gudgeons, whilst it not unfrequently happens that they are set fast, or greatly obstructed by oxidation, when iron is used.

Where guide rods, or stems of valves, floats, or other rods or stems, are to slide endwise, the principle of construction and of operation will not be thereby changed; the lining, and the ledges to confine it, being similarly employed, and the advantages derived will be the same in a sliding, as in a revolving motion.

Having thus fully described the nature of my additional improvements, and having also furnished various exemplifications of the manner in which, and the purposes for which, they may be used: what I now claim, in addition to my former claims, is the making or forming of recesses or rebates, in the manner set forth, in the ends of the boxes or sockets, for axles or gudgeons; which rebates or recesses are to be filled with the composition metal which constitutes the lining of said boxes, so as to form end bearings of that material. I also claim the employment

of boxes, or sockets thus prepared, with such ledges and lining, whether used for a sliding motion, as in the guides of steam engines, or in the packing of rods or stems, instead of the ordinary elastic packing; or in any way, or for any other purpose, which is substantially the same.

ISAAC BABBITT.

THOS. P. JONES, }
B. K. MORSELL, } *Witnesses.*

I HEREBY CERTIFY the foregoing additional Schedule has, this fourth day of September, one thousand eight hundred and forty, been duly annexed to the original patent of Isaac Babbitt, and that the same is duly recorded on the books of the Patent Office, and that fifteen dollars, the duty by law required, has been paid into the Treasury of the United States.

H. L. ELLSWORTH,

Commissioner of Patents.

WHEREAS, upon the petition of Isaac Babbitt, of Roxbury, Massachusetts, for an extension of the within patent, granted on the 17th day of July, 1839, the undersigned, Commissioner of Patents, in accordance with the 18th Section of the Act of Congress, approved the 4th day of July, 1846, entitled "An Act to promote the pro-

gress of the useful arts, and to repeal all Acts heretofore made for that purpose," and the Act approved the 27th day of May, 1848, entitled "An Act to provide additional examiners in the Patent Office, and for other purposes," did, on the 8th day of July, 1853, *certify that the said Patent ought to be extended.*

Now, therefore, I, Charles Mason, Commissioner of Patents, by virtue of the power vested in me by said Acts of Congress, do renew and extend said Patent, and certify that the same is hereby extended for the term of seven years, from and after the expiration of the first term, viz. the 17th day of July, 1853; which certificate being duly entered of record in the Patent Office, the said Patent has now the same effect in law, as though the same had been originally granted for the term of twenty-one years.

In testimony whereof, I have caused the seal of the Patent Office to be hereunto affixed, the 8th day of July, 1853, and of the Independence of the United States, the seventy-eighth.

CHAS. MASON,

Commissioner of Patents.

EXTRACTS FROM THE PETITION OF MR. BABBITT,
FOR THE EXTENSION OF HIS PATENT.

To the Honorable Commissioner of Patents, at the United States Patent Office, Washington, D. C.

Respectfully represents Isaac Babbitt, of Roxbury, Massachusetts: —

That he is the first, original, and true inventor and Patentee of the “Improved mode of making Boxes for Axles and Gudgeons;” for which Letters Patent were issued to him, dated the 17th day of July, A. D. 1839, with the additions thereto annexed, dated the 4th day of September, A. D. 1840.

And that he is desirous of procuring an extension of his said Patent, beyond the term of its limitation, for and during the period allowed by law.

And he says that he believes that he was the first person in this country who succeeded, untaught, and by his own unaided efforts, in combining the materials for, and in manufacturing, Britannia Ware of the best quality and highest finish; and that he was, as he believes, the originator and founder of the successful making and manufacturing of the best kinds of Britannia ware in the United States.

And he further says, that subsequently thereto, he was also, as he believes, the first person in this country who

succeeded in tinning cast iron hollow ware, successfully and perfectly; and that for his Britannia ware, and tinned cast iron hollow ware, he obtained various prizes.

And he further says, that subsequently thereto, he was also, as he believes, the first person in this country who succeeded in making and rolling sheet zinc, and zinc foil, of a perfect kind and uniform quality.

And he further says, that subsequently thereto, he was also, as he believes, the first person in this country who succeeded in the perfect casting of brass cannon; and that he cast a large number of such cannon for the United States Government.

And he says, that he arrived at his knowledge and success in these matters, only after long and laborious study and experiment, and great expenditure of time and money. And that his attainments and skill rendered his services, as a scientific and practical worker in metals, of great value, and brought them into high demand, so that he could readily command the highest prices for his skill and labor.

And he says, that he mentions these facts, not as bearing upon his present petition, except as they show his knowledge and skill, and as furnishing conclusive reasons for the correctness of the estimate of the value of his time and services as a workman, for himself and others.

And the said Isaac Babbitt says, that while he was engaged in the casting of brass cannon for the government, about the year 1836, he conceived the idea of using metallic boxes lined with some composition metal of softer

material, for the bearings of axles and gudgeons, where any considerable wear or strain was necessary to be applied.

That for the bearings of machinery, locomotives, and car axles, and cranks, crank-shafts, and crank-pins of steamboats and engines, it had been customary to use brass or gun metal, as the material upon, and in which, axles, gudgeons, and pins revolved; but that the same were so constantly liable to heat and abrasion, as to occasion infinite trouble and expense, to say nothing of unremitting care and anxiety. In fact, so great was the uncertainty and trouble, that in very many instances it was impossible to rely upon the workings of steam vessels and locomotives.

That, fully aware of these difficulties, and with the desire of obviating them, having conceived the idea of using a softer composition metal as a lining to boxes, upon, around, and in which, the axles, gudgeons, pins, and connecting-rods might revolve and move, he set about making experiments, and continued them till the year 1839, when he so far perfected his invention, as to apply it to actual practical use, and to secure a patent therefor; which patent was issued July 17th, A. D. 1839, as aforesaid; to which additions were subsequently made, September 4th, A. D. 1840, and an extension of which he now seeks.

And he says, that immediately before, at, and ever since the granting of said Letters Patent, he devoted himself exclusively to the subject matter of said patent, and the introduction thereof into general use.

And he says, that it was for a long time impossible to convince even practical machinists and engineers of the possibility, and especially of the practicability, of using softer metals for the bearings of machinery where any considerable strain or power was to be experienced or applied; that the idea that the use of a softer metal would occasion less heat, and diminish friction and abrasion, and consequently trouble and expense, seemed to most, an absurdity. And that it was only after long and great labor, and with the most persevering exertion, that he could so far overcome prejudice as to introduce the use of his softer metallic linings for boxes, for axles and gudgeons, to any considerable extent.

And he says, that his object being practically to demonstrate the use of his metallic boxes, and to introduce them into practical use, he procured a shop to be built, and went to work manufacturing boxes of different kinds for different machinery. That he went to great expense of time, and labor, and money, to render his work perfect in quality and material, and perfectly adapted to the uses to which it was to be applied. That of the work so made by him he gave away a very great part to railroads, manufactories, and others, for the purpose of inducing them to test the material and its qualities; and that he was obliged to travel about, at great loss of time and at great expense, for the purpose of introducing his invention, and of inducing persons, corporations, and companies to give it a practical trial.

And he says, that he believes the said invention, and

the idea thereof, and the practical application thereof, to have been entirely novel and original with himself, and that its novelty and nature was such that users and purchasers were to be sought out and solicited with care and importunity; although when once used, it could not, and did not, fail to commend itself to their unqualified approbation.

And he says, that the saving of from fifty to seventy-five per cent. in the single article of oil, and the gain of seventy-five to a hundred per cent. in the number of miles run without repairs, in the running of locomotive engines, may, perhaps, sufficiently demonstrate the usefulness, as well as the value and importance, of this invention, to the public; but when this advantage, to say nothing of others, comes to be applied to all machinery, and to all bearings where there is strain and wear, the utility, as well as the value and importance of the invention, would seem to be well nigh incalculable. Such, indeed, is its usefulness and value, that in the belief of said Babbitt, if it were now blotted out of existence, millions of money alone could not replace it or atone for it. And he verily believes, that without it no locomotive of any power, and no steamship, could be relied upon with any certainty, even for a short period of time.

And he begs leave to refer to printed copy of American and English reports and certificates concerning his patent boxes, accompanying this petition, as containing, as he believes, true and reliable statements, worthy the consideration of the Commissioner.

And he says, that in the outset he put the price of his work at a very low rate, as an inducement to persons to purchase the same, and that very soon afterwards the price of the main ingredient of his composition largely advanced ; but that having once fixed his price for work, he could not well vary it, especially as he was anxious to induce persons to become purchasers, and to employ him ; and his invention being unknown, he was compelled to solicit notice, instead of waiting to be solicited.

And he says, that he was frequently obliged to get up patterns and castings, at large expense, and then to make work at a large sacrifice, that he might produce and take the work, ready for use, to the several railroads and manufactories, to induce, by gift, or sale at small price, the trial of the invention.

And he says, that after a time he found it necessary to keep in his employment a number of men more than he had work for steadily, because he occasionally would have an order for work of some magnitude, and it was necessary to have the workmen on hand in readiness to execute it promptly, although, for a large portion of the time, they could not be employed to advantage or profit. And, besides, whenever any order was obtained for work, he felt obliged to keep his workmen in pay and readiness, under the constant hope and expectation that business would increase, and command all their time.

And the said Babbitt says, that he was induced to incur these expenses with the hope and expectation that, as he knew his invention to be eminently useful and of

great value, others would, in this way, become informed thereof, and acquainted therewith, and that after he had made and introduced it into actual practical use himself, he should eventually realize from the patent itself, and the sale of licenses thereunder, rather than from the work which he might manufacture.

And he says, that he was greatly desirous that his invention should be fully and fairly examined, and practically tested, and that the work to be tried should be of the best and most perfect quality; and that he labored, and travelled, and expended large sums, with the full knowledge that his said invention would stand any test, however rigorous, and that it was only by constant and persevering personal exertions and gratuitous gifts, that he could so bring it to the practical knowledge of those who would be most benefitted by it, as to overcome prejudices against it, and cause it to come into general use.

And he says, that he made and gave away very large amounts of work, not only to individuals, companies, and corporations, but that he made and gave away work, to a considerable extent, to the navy yards of government, at Charlestown and at Washington; and that he also sent out large quantities of metal, and samples of work, to various places, and in various ways, at his own cost.

And he says, that in the year 1842 he took means to introduce it the government of the United States, with the hope of inducing government to purchase of him the right to use his invention in and about their machinery and mechanical operations.

And he says, that at or about that time, the United States steamers Mississippi and Princeton were building, or had just been built, and that it was found impossible to make them operate with any satisfaction without the use of his invention. And that, although the former vessel was completed without, she was, as he is informed and believes, subsequently brought to Boston, and had her main deck taken up for the purpose of putting in his patent boxes for her main shaft; while, as he is also informed and believes, the constructor of the latter vessel would not suffer her to be completed, unless this said patent invention could be used therein.

And he says, that after considerable exertion and great expense on his part, the government of the United States was authorized by Congress to make with him a contract for the right to manufacture and use his invention wherever they might wish; which authority was exercised by the Secretary of the Navy, in September, A. D., 1842, and in the spring of 1843, the sum of \$20,000, was paid to said Babbitt, by the United States, for their right to make and use his said patent. And he begs leave to refer to printed copy of the report made in the Senate, in April, 1842, with the documents therein referred to, contained in the Book of American and English Reports, accompanying this petition.

And the said Babbitt says, that at this time he had expended all his means, including not only all that he had invested in his business originally, but also all that he had received, as well from his patent, and the sale of

licenses to use the same, and from his workshop and foundry, as from any and all other sources; and that he was moreover largely in debt, so much so, in fact, that had it not been for this contract made with the government, and the money received therefrom, he would have been compelled to cease operations entirely, and become openly insolvent.

And the said Babbitt says, that he continued his workshop and foundry, enlarging the same somewhat materially up to the fall of 1846, being continually and unremittingly engaged in labors and experiments, for the purpose of perfecting his invention, so that it should be presented in the most simple, perfect, and reliable form, and should afford to the public the utmost utility; and that meantime he was using every effort, by personal exertion and otherwise, to introduce it into general use.

And he says, that in order to perfect his said invention, or rather as an inducement to others to purchase and use it in its perfected form, he found it necessary to make many experiments regarding the best proportions and the best mode of combining the several ingredients necessary to make the composition metal with which he lined his boxes; and that he did this at great labor, and expense, and care, that he might the more readily instruct others in the use of his invention, and that it might in no degree fail of its utility through their ignorance or unskillfulness.

And he says, that among other things, and in connection with his applications to railroads, he expended large sums in putting up and in fitting up a cupola furnace, for

the purpose of getting up jaws and pedestals for railroad cars, in order that, by perfecting and adapting the immediate adjuncts, he might further perfect his invention, and so bring it more favorably before the public, and more extensively into use.

And he says, that he went to great expense and trouble in attempting to adapt and introduce his invention to the running part of carriages for common roads; and that in order to accomplish that, he was obliged not only to make boxes for the carriage axles, but also to make axles themselves, fitted and adapted to his boxes, so that the whole thing, with its adjuncts, might be perfect, and not in any respect fail by reason of the ignorance or want of skill of others who might make boxes and axles ill-fitted and adapted to each other, and ill-constructed for the purposes desired. That his object was to present a thing not only *useful* and *valuable*, but to present it in the most perfectly useful manner for practical operation, especially as he had known many a good thing to fail of success through want of sufficient care and skill in the first experimental trials. That he spent more upon this matter than he otherwise would have done, because he well believed that the invention was, in fact, so useful and valuable for the purposes of application to common carriages, that if he could once succeed in introducing it into use among carriage makers, it would come into general demand, and would thus become to him a source of great profit. And he says, that although his opinion of the utility and value of the invention, as so applied, did not change, he found that in-

asmuch as there was no such pressing necessity of its use for that purpose, as there was in the case of railroad cars and heavy machinery, he should be disappointed in the demand which he anticipated, and would only add to his losses, already heavy, by continuing the manufactory of carriage work, especially as it would require more time, travel, and expense, to introduce it further to the personal notice of carriage makers, than he could afford to spare.

And he says, that his foundry and workshop, up to the fall of 1846, aforesaid, when he abandoned them, were a source of expense and loss. But he says that he kept up the said foundry and workshop, and continued at work with the hope and confident expectation that his invention once introduced and known, he should then begin to reap his reward.

And he says, that throughout all this time he found it necessary, to a greater or less extent, to make and give away work, or to sell it at small prices, and to make great personal exertions to bring his invention into notice and use.

And he says, that in 1844 and 1845 he was engaged in an expensive suit at law against the Buffalo Steam Engine Company, which was finally tried at Canandaigua, in the State of New York. That his expenses in carrying on the suit, and in preparing for trial, and trying the same, were very large and heavy. That the suit terminated in his favor, the jury returning a verdict for him of forty-five hundred dollars; but that at the intercession of

some of his own witnesses and friends, and with the advice of counsel, as he wished rather to sustain his patent than to recover damages, he was induced to settle with said Company, upon their paying a small amount.

And he begs leave to refer to the copies of letters and correspondence regarding said suit, annexed to this petition; as also to a printed report of a trial in England, where his patent was triumphantly sustained, which he begs to submit for consideration.

And he says, that another suit was commenced against the Buffalo and Attica Railroad Company; but that the said Company settled the same without a trial.

And he says, that one other suit was commenced against the Boston Mill Dam Company; but the same was by them compromised and settled without a trial.

And he says, that late in the fall of 1846 he abandoned his manufactory; but that he continued as diligent as he could well be in pushing his said invention, and in securing to himself a remuneration therefor; but that as the period of his patent drew near its close, he did not feel authorized to risk the little he had acquired; and besides that, during the last two or three years, his bodily health has been more infirm, and he has felt unable to enter into any controversies that might arise regarding his rights, and to urge the payment of what is actually his due, or to go far to urge the adoption or sale of his patent, or of any rights or licenses thereunder.

And he says, that the idea of procuring an extension of his said patent is only recently entertained. That he

so well knew the inestimable value and usefulness thereof, and he may say, the absolute necessity of the invention to machinery life, that he hoped he should reap a fair reward for what he had so well done ; but he had been grievously disappointed.

And he says, that he cannot hesitate to affirm, with the utmost positiveness, that all the remuneration he has received from his said patent, is totally inadequate to the great usefulness, value, and importance of his invention to the public, although he has used his best endeavors to bring it into general use, and to derive a sufficient remuneration therefrom.

AFFIDAVITS.

AFFIDAVIT OF WILLIAM RAYMOND LEE,

Late Superintendent of the Boston and Providence Railroad, and President of Vermont Central, Rutland and Burlington, and Ogdensburg Railroads.

I, WILLIAM RAYMOND LEE, of Boston, in the State of Massachusetts, on oath, depose and say,—That I am a Civil Engineer by profession, and have been, and am still, Superintendent of the Boston and Providence Railroad, which appointment I have held since July 1st, A. D. 1835. That I am well acquainted with Mr. Isaac Babbitt, inventor and patentee of “an improved mode of making Boxes for Axles and Gudgeons,” and have been so during the last thirteen or fourteen years. That I know him as a man well versed in practical chemistry, and very expert as a worker in metals. That I have often visited his shop, and have personal knowledge that he has applied himself with great industry and success in the pursuit and application of the principles of science to useful ends and purposes, and the advancement of the useful arts.

It is within my knowledge, that his labors have resulted in practical results, particularly beneficial to the econ-

omy of working machinery, especially in the department of locomotive, marine, and stationary steam-engines, by the successful application of soft metal in the construction of bearings, usually called boxes for Axles and Gudgeons. About the year 1840, Mr. Babbitt called my attention to his improved mode of constructing these essential appendages to rotating machinery, and after a careful consideration of the principles under which he claimed to act, I was so well satisfied with the utility, value, and importance of the invention, that I determined to give him an opportunity, on the Boston and Providence Railroad, to test practically its value. I accordingly did so, and had locomotives and cars fitted up with his improvement, under his own direction, he having prepared the boxes, and also the metal, with which the cells were to be fitted. The result was so entirely satisfactory and conclusive, as to the merit of his improvement, both in relation to economy in the reduction of friction, and obviating the heating of the parts in contact, that I at once purchased a right of construction and use from him, on behalf of the Boston and Providence Railroad. The application of his improvement was extended to all the machinery upon the road, with as little delay as possible, and indeed, much new work of the old description was removed to give place to Mr. Babbitt's improvement. From that day to the present hour, we have continued its use with uninterrupted success, and as I fully believe, greatly to the advantage of the Corporation in a pecuniary view.

This improvement, like all other innovations upon exist-

ing usages, met with the usual opposition and prejudices, presenting obstacles to a due award of praise and profit to its inventor, but it has at this time forced itself into public favor by its intrinsic merits, by means of the great diligence and perseverance of Mr. Babbitt, and the interest and aid of some of his friends who have taken an interest in such matters, as well as in his personal efforts. Mr. Babbitt's charges for the use of his invention to railroads were very moderate, and whatever his receipts may have been, I have reasons to believe that they were greatly exhausted in his anxious efforts to perfect and introduce his improvement into general use, and in experimenting upon the best means of operating.

From my knowledge of Mr. Babbitt's scientific attainments in the branches of knowledge to which I have alluded, and his indefatigable industry in pursuing experiments to determine results, the value of his time and services to any large establishment engaged in the manufacture and application of metals, chemicals, or compositions adapted to the useful arts, would be invaluable, and would readily command a high compensation, certainly not less than three thousand dollars per year. I should have added, that the application of his improvement in making Boxes for Axles and Gudgeons, resulted, as indicated by experiments made by myself, in a saving of about fifty per cent compared with the method for which it was a substitute; and I am fully of opinion that Mr. Babbitt richly deserves an adequate compensation for the use of his improvement, by its application to railroad, and other

machinery, which shall come into existence and use, after the expiration of his present letters patent.

[Signed,]

WM. RAYMOND LEE.

State of Massachusetts.

Suffolk, ss. April 20th, 1853.

Sworn to before me, C. DEMOND,

Justice of the Peace.

AFFIDAVIT OF GEORGE S. GRIGGS,

Principal Machinist of the Boston and Providence Railroad.

I, GEORGE S. GRIGGS, of Boston, Massachusetts, on oath declare and say,—That I am a practical machinist, and have been for many years engaged in the construction of locomotive engines and machinery. I am the principal machinist of the Boston and Providence Railroad Company, and have been acting in that capacity, since the year eighteen hundred and thirty-five, during which time I have built a large number of engines for said road, and have become thoroughly and practically acquainted with the running of locomotives and cars, and the several means and appliances connected therewith, as well as of other stationary machinery.

I know Isaac Babbitt, the inventor of “an improved mode of making Boxes for Axles and Gudgeons,” and

have known him ever since he obtained a patent therefor. He is a man of great practical skill, and scientific knowledge as a worker in metals, as well as a man of great energy and perseverance, and of unimpeachable integrity and truthfulness. I am well acquainted with the practical effects of his invention, and of its uses as applied to moving and stationary machinery, and can certify to its value and importance. Before Mr. Babbitt's invention, great and constant difficulties and embarrassments were found attendant upon the running of locomotive and marine engines, and, indeed, of all machinery, where there was any considerable degree of strain or power, and wherever a high rate of speed was desired. This was owing to the constant heating and abrasion of the axles, gudgeons, crank-shafts, and pins, and connecting-rods, which was so constant and so great, as to render the operations of the machinery uncertain and unreliable, and to subject it to frequent accident, and more frequent repairs. The amount of lubricating material was also necessarily very great, and the wear and tear rapid and expensive.

Aside from the actual expense of repairs, and of the various projects resorted to to prevent heating and friction, the capacity of machinery was much limited, and the anxiety and constant care requisite to keep it in proper order, was a source of very great trouble.

Mr. Babbitt's invention at once met and overcame, in a great measure, the above mentioned objections. It greatly diminished the friction of the running parts of machinery where it was applied. It effectually prevented the heating

and abrasion of the parts, and occasioned a very large saving in lubrication and repairs, while it gave regularity and certainty to the operations of engines and machinery, and furnished infinite relief to the anxiety and care of the engineer and machinist. By means of this invention, the capacity of machinery was greatly increased, and not only would such machinery accomplish more by being enabled to expand upon the load, or the thing to be accomplished, a large portion of the power that had been previously used to overcome the friction, but it was enabled to move with vastly more rapidity, and certainty, and safety.

The value of the invention cannot be computed. The mere saving in expense, as connected with the means of lubrication and of repairs, is immense. I do not see how engines and machinery of magnitude, and high rates of speed, could now be run without it, or something equivalent to it. It has come to be well nigh, if not quite, a necessity in mechanics.

I know somewhat of Mr. Babbitt's efforts and labors to introduce his said invention into use. It was a long time before he could overcome the prejudices of even practical mechanics, and he often times finally succeeded in so doing, only by stealthily introducing his invention into actual use, and then pointing to its triumphant action.

His efforts and exertions were incessant, and he was obliged to establish a manufactory, and himself make boxes, lined with soft metal and finished for use, and then give them, in many instances, away, before he could

persuade those actually most interested in the result, of the great practical utility of the invention. His difficulties and discouragements were great, and such as would have overborne a man of less activity and perseverance.

I do not believe Mr. Babbitt has ever realized a remuneration at all adequate to the vast value, utility, and importance of his invention, although I believe that he has exercised all due diligence, effort, and care, to secure to himself a proper reward.

Mr. Babbitt's scientific knowledge and practical skill, would have entitled him to large compensation for his time and services during the last fourteen years. I think he might have readily commanded from two thousand to twenty-five hundred dollars a year, during that time.

His invention should entitle him to a fortune, and that he has not realized from it a sum at all adequate to its value and importance, has been from no fault of his. Were the invention totally lost, millions of money might well be spent in restoring it, if it could not be otherwise obtained. Two hundred thousand dollars would be no more than a fair remuneration to its inventor, in my judgment. I have no interest in the patent, nor do I expect to have.

[Signed,]

GEORGE S. GRIGGS.

Commonwealth of Massachusetts.

Suffolk, ss. April 18th, 1853.

Sworn to before me,

JOEL P. BISHOP,

Justice of the Peace.

AFFIDAVIT OF CHARLES G. GREENE, Esq.

*Editor of the Boston Post, and Naval Officer of the
Port of Boston.*

I, CHARLES G. GREENE, of Boston, Massachusetts, Editor of the Boston Post, on oath depose and say,—That I have known Mr. Isaac Babbitt, Patentee and inventor of “an improved mode of making Boxes for Axles and Gudgeons,” for many years. He is a man of great industry, skill, and integrity, and his statements may at all times be fully relied upon. His ability as a scientific and practical worker in metals, is undoubted, and his time and services in that behalf, would readily command the highest prices. His inventive genius and perseverance are very great. From the knowledge I have of Mr. Babbitt’s invention, I believe it to be one of vast utility and value to the public, and in the running of all heavy machinery, and in all cases where great speed, combined with safety, is sought for, it has come to be a necessary concomitant. It is believed to be invaluable in preventing the heating and wearing of the running parts of machinery, axles, gudgeons, connecting-rods and crank-pins, and in saving of expense in the matter of repairs and lubricating materials. As a means of promoting the safety of the lives and limbs of passengers, in rail-cars, and steam-vessels, and reliability of the operations of steam machinery, it is of the highest importance. I believe Mr. Babbitt to have used all due diligence to bring his invention into general notice and use; and to obtain a suitable reward therefor.

Considering the value, usefulness, and importance of the invention, according to the knowledge I have, I am of the opinion that Mr. Babbitt has by no means realized a remuneration adequate thereto. The patent, in my judgment, is one eminently worthy of being extended, and Mr. Babbitt is a man as eminently worthy of receiving the extension.

[Signed,]

CHARLES G. GREENE.

Commonwealth of Massachusetts.

Suffolk, ss. March 29th, 1853.

Sworn to before me, A. B. ELY,

Justice of the Peace.

AFFIDAVIT OF HON. RUFUS CHOATE,

Of Boston.

I, RUFUS CHOATE, of Boston, Massachusetts, Esquire, on oath depose and say,—That I know Isaac Babbitt, the Patentee of “an improved mode of making Boxes for Axles and Gudgeons,” and have known him for several years. He is a man of great skill as a practical and scientific worker in metals, and of great industry, and unimpeachable integrity, and any statements made by him, may be fully relied upon as true.

I was on the committee on Naval Affairs, in the United States Senate, in 1842, to whom was referred the matter of authorizing the Secretary of the Navy to purchase for the government, the right to use for government purposes, Mr. Babbitt's patent, and presented the report of said committee. I believe that the printed copy of the said report, with the documents and letters therein referred to, contained in a little book, entitled "American and English Reports, References, and Certificates, concerning the Patent Box, lined with soft metal, invented by Isaac Babbitt, printed for the patentee, Boston, Oakes & Solomons, Stationers, 20 State Street, 1848," which I am informed is to be submitted with said Babbitt's petition, for an extension of his said Patent, is a true copy of said report, and documents, and letters.

From my examination of the subject, I believe the invention is one of very great value, utility, and importance to the public; that, in fact, it is now a necessary thing in all machinery of any magnitude or power. I would respectfully refer to the above mentioned reports relating to this thing.

Mr. Babbitt has used great diligence and effort to bring his invention into general use, and to secure to himself a remuneration therefor; but he has labored under disadvantages, during a great part of the time, which have prevented him, as I fully believe, from realizing a remuneration at all adequate to the vast usefulness, value, and importance of the invention, to the advancement of mechanical facilities, and the mechanic arts. In my judg-

ment, an extension is due to Mr. Babbitt upon every principle of law and justice.

[Signed,]

RUFUS CHOATE.

Commonwealth of Massachusetts.

Suffolk, ss. April 1st, 1853.

Sworn to before me, A. B. ELY,

Justice of the Peace.

AFFIDAVIT OF NOAH BUTTS,

Engineer of Charlestown Navy Yard.

I, NOAH BUTTS, of Charlestown, in the State of Massachusetts, on oath depose and say,—That I am Engineer of the Navy Yard of the United States, at Charlestown aforesaid, and I have the care of all the engines in said yard. I have been connected with said yard, and the care of said engines, for about twenty years. I know Mr. Isaac Babbitt, inventor and patentee of “an improved mode of making Boxes for Axles and Gudgeons,” and I have known him for many years. He is a man of great skill and knowledge as a practical and scientific worker in metals, and of great industry and integrity. In my opinion, he could have commanded the highest salary and prices for his time and services during the last fourteen years. Any statement made by him, may be fully relied upon as true.

I am well acquainted with the said invention of Mr. Babbitt, and the practical working and importance thereof. I consider it to be of really incalculable value, and one which could hardly be dispensed with by machinists and engineers. It occasions a very great saving in wear and tear, and in the use of lubricating materials, and prevents the heating and abrasion of the journals, axles, and crank-pins.

I was at the said Navy Yard, at the time when the United States Steam Frigate Mississippi was first brought hither, and know the fact that her main shafts were lifted for the purpose of putting in Mr. Babbitt's invention. Before said invention was applied to said steam frigate, great complaints were made of the workings of her machinery, and the uncertainty of her operations, so that it was found necessary to adopt said invention of said Babbitt, in connection with said machinery. Since said invention was applied to said steamer, I have heard no complaints made. Wherever there is much wear or strain, or wherever a high rate of speed is required in steam engines or machinery, I am persuaded that the invention of Mr. Babbitt has become to be almost, if not quite, a necessity.

Mr. Babbitt, I believe, used very great diligence, and pains, and care, to introduce his said invention into general use, and to bring it into notice, and for a long time labored under great discouragements and disadvantages in so doing. The success which he had, was owing to his great perseverance and constant exertions. I could not

well estimate what would be an adequate remuneration for such an invention; but I believe that Mr. Babbitt has used all due diligence in his efforts to acquire such remuneration, and for an invention of such incalculable utility, value, and importance, he is entitled to the highest possible reward. I believe his remuneration to have been such, and so small, as will fairly and justly entitle him to an extension of his patent aforesaid, and in my judgment, he is every way worthy of such extension. I have no interest in said patent, otherwise than that I should not be willing to do without the right to use it in the engines under my care, where we have used it these years.

[Signed,]

NOAH BUTTS.

State of Massachusetts.

Suffolk, ss. April 11th, 1853.

Sworn to before me, A. B. ELY,

Justice of the Peace.

The United States Patent Office.

To all persons to whom these presents shall come, Greeting :

THIS IS TO CERTIFY, that the annexed are true copies from the Files of this Office.

IN TESTIMONY WHEREOF, I, Charles Mason, Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed, this sixteenth day of September, in the year of our Lord one thousand eight hundred and fifty-three, and of the Independence of the United States the seventy-eighth.

CHARLES MASON.

AFFIDAVIT OF GEORGE DARRACOTT,

Late Agent and Engineer of the Boston Gas Light Company.

I, GEORGE DARRACOTT, of Boston, in the State of Massachusetts, on oath declare and say,—That I have been for many years, and until recently, the agent and engineer of the Boston Gas Light Company. That I was educated as a mechanic, and am well acquainted with machi-

nery, both as regards its scientific principles, and its modes of operation.

It is well known to every one who is acquainted with the history of the progress of machinery, that wherever the parts of a machine are very heavy, or where there is much wear and strain, and especially if the motions be rapid, it has been found exceedingly difficult, if not impossible, to discover and apply any kind of lubrication to the bearings, so as to prevent excessive friction, heating, and abrasion of the parts, thereby causing injury, delay, expense, and anxiety.

It has long been considered a *disiratum* to discover some lubricating substance or material, or amalgamation of materials, for the lining of boxes, journals, and the rubbing parts of machinery, which would prevent heating and abrasion.

This desideratum, Mr. Isaac Babbitt, after a series of experiments, succeeded in discovering or inventing; and in his letters patent he describes it as "an improved mode of making Boxes for Axles and Gudgeons."

I have been acquainted with Mr. Isaac Babbitt, patentee of the above invention, for many years. He is a man of great skill in the application of the principles of science to manufactures; and he has been long a profound investigator of the nature, laws, qualities, and capacities of metals, as well as an eminently successful practical and scientific worker in metals. He is well known as a man of great integrity and truthfulness; and his statements may be fully believed. He is also a man of great

industry and perseverance, and the public are much indebted to him as regards the advancements of science and the mechanic arts.

His efforts to introduce his improvements in boxes for axles and gudgeons, were continued for many years after the invention, at great sacrifices on his part, by advertisements, by gifts and presents, by personal attention, and expensive manufactures, and by devoting, in many instances, gratuitously, his stock and his labor for the purpose of getting people to try his invention. For a long time, he was compelled to be at the expense of getting up and maintaining a manufactory, that he might furnish his invention ready made, and fitted for use; and he manufactured articles embracing his said invention, and gave them away, and sold them at less than cost, in the belief that the time would come when he should be remunerated.

Following this course with the confidence of a discoverer, and with the energy and perseverance of a man convinced of the intrinsic value of his invention, and determined to rise or fall with its success, he at times became almost bankrupt in his finances, and discouraged in his efforts; but still he persevered, until at last he succeeded in establishing the utility of his invention, and in getting it introduced into different parts of the country.

But this being done, a great number of persons made use of the invention without his knowledge, and without right; and many have used it in such a way as to afford no compensation to Mr. Babbitt, without his engaging in

expensive suits at law. But from this he has been deterred, alike by his peaceable disposition, and by his unwillingness to embark what little means he has acquired upon the sea of litigation.

Thus, the time limited for the duration of his patent is about expiring, and he has not received a compensation at all adequate to the value and importance of his invention, although he has used all due diligence and efforts to secure to himself such compensation.

I was knowing to many of Mr. Babbitt's earlier efforts to introduce his invention into use, and I was induced, from my own conviction of the actual intrinsic value and usefulness of the thing, as well as from my personal regard for Mr. Babbitt, as a man of great worth of character, to aid him somewhat in persuading others to try his invention, and to test its utility by actual practical use. It was with great difficulty that those to whom the invention has proved to be of the greatest benefit, could, at first, be induced to give it a fair trial, and their prejudices were overcome only after great solicitation and perseverance, and after actual trial had convinced them of the groundlessness of their objections. It was only as a personal favor to myself, that one of the railroad corporations in Boston, could be prevailed upon to try Mr. Babbitt's invention, even to a small extent, and yet, after that corporation had finally purchased, for a small sum, the right to use said invention, the superintendent thereof himself informed me, that he would not be deprived of the invention, and the right to use it, for \$20,000; nor, in-

deed, for any sum that could be named, of such vast value did he consider it. I also happened, without, however, the knowledge at the time of Mr. Babbitt, to be instrumental in inducing the Hon. Mr. Upshur to conclude the contract with Mr. Babbitt, by which the United States Government acquired the right to use his invention for the sum of \$20,000. If government could have acquired the right only by paying a much larger sum, it would have been well warranted in so doing. Mr. Babbitt's labors were unremitting, and it was only by indomitable perseverance that he succeeded in overcoming the obstacles in his way.

I know of no invention so perfectly simple in its nature, and apparently so obvious when once tried, which is of so great importance in the running of all machinery, especially where rapid motion is required, as on railroads, steamboats, &c., and where so great a saving is made at so little cost; yet this had never been done, until Mr. Babbitt's inventive mind made it practicable.

I have been requested to state my opinion in answer to the following questions:

1st. What is the value of Mr. Babbitt's time and services, annually?

2d. What would be an adequate remuneration to Mr. Babbitt, considering the value, usefulness, and importance of the invention, and the time, labor, and expense he has devoted to it, and its introduction into use?

In answer to the first I should say, that taking his knowledge of science, and his practical skill into the

account, his services for the last fourteen years, were well worth, annually, at least two thousand to twenty-five hundred dollars.

In answer to the second ; the value, utility, and importance of the invention cannot be computed, being actually incalculably great. It is difficult to estimate what would be a proper remuneration to the inventor ; but I should say, that from one hundred to one hundred and fifty thousand dollars would not be too large. An invention of such importance, value, and usefulness, should bring to the inventor the largest remunerative return, and that largest return could not more than compensate such a man as Mr. Babbitt for all his labor, and anxiety, and his expenses, and inventive genius, and skill. I am in no way interested in said patent, nor do I expect to be. In my judgment, an extension of the patent is justly and fairly due to Mr. Babbitt.

GEO. DARRACOTT.

State of Massachusetts.

Suffolk, ss. April 27, 1853.

Sworn to before me, C. DEMOND,

Justice of the Peace.

AFFIDAVIT OF CHARLES S. STORROW,

Formerly Superintendent Engineer of the Boston and Lowell Railroad, Agent of the Essex Company, Lawrence, Mass., and present Mayor of that city.

I, CHARLES S. STORROW, of Lawrence, in the State of Massachusetts, on oath depose and say,—That I have been largely engaged, for many years, in works of Civil Engineering, and connected with the management of machine shops. That I became acquainted with Mr. Isaac Babbitt's improved mode of making or lining Boxes for Axles and Gudgeons, soon after its first introduction. That I purchased the right to use it for the Boston and Lowell Railroad, of which I was the engineer and general agent. And that several years subsequently, I also purchased it for the Essex Company, at Lawrence, owners of an extensive machine shop; of which Company I have been, and still am, the general agent. That I have always considered, and do consider, Mr. Babbitt's improvement to be one of great practical utility; and that in neither of these two cases was I called upon to pay more than what seemed to me a moderate and reasonable compensation for the time and expense bestowed by Mr. Babbitt upon its invention and introduction.

CHAS. S. STORROW.

Boston, May 9th, 1853.

State of Massachusetts.

Suffolk, ss. May 9th, 1853.

Sworn to before me, A. B. ELY,

5

Justice of the Peace.

AFFIDAVIT OF S. V. MERRICK,

*Builder of the United States Steam Frigates Mississippi
and Missouri, Philadelphia.*

I, SAMUEL V. MERRICK, of Philadelphia, in the County of Philadelphia, and State of Pennsylvania, being duly sworn, do hereby depose and say,—I am a manufacturer of Marine and other Steam Engines; in which occupation I have been engaged for sixteen years. I am well acquainted with Isaac Babbitt's Patent Gudgeon Box and Soft Metal Lining, and have used the same upon moving bearings, for the last ten years, or thereabouts.

This metal has been long enough in use to test its merits, and I consider it a most valuable improvement in the construction of moving machinery.

- 1st. It effects a diminution of friction.
- 2d. a considerable saving of oil.
- 3d. an economy in the original construction
 of bearings.
- 4th. a saving in repairs.

I am personally acquainted with Mr. Babbitt, and believe that he has used due diligence to introduce his invention into use. He is a skilful worker in metals, and, in my opinion, could have commanded a high price for his services as such, during the past fourteen years.

It is difficult to estimate the value of this invention, nor am I advised of the amount of compensation already realized. It was undoubtedly new at the time it was patented, and has since become an almost indispensable

adjunct to many kinds of heavy machinery ; and, in my judgment, the time ought, in justice to the inventor, to be extended.

I am in no way interested, neither do I expect to be, in the patent or its extension, except that I am the owner of a right to use the same.

Furthermore this deponent saith not.

S. V. MERRICK.

Philadelphia, May 6th, 1853.

Sworn and subscribed before me, at Philadelphia, this 7th day of May, A. D. 1853.

JNO. B. KENNEY,

Alderman and Justice of the Peace.

AFFIDAVIT OF CHARLES W. COPELAND,

Mechanical Engineer, and Manufacturer of Marine Engines of the largest class. Appointed Engineer of the United States Navy, and declined. New York.

I, CHARLES W. COPELAND, of the city of New York, by profession a Mechanical Engineer, and for the last twenty-one or twenty-two years, engaged in various capacities in the manufacture and management of steam and other machinery, have also been largely engaged in the construction of marine engines of the largest class.

I hereby certify, that I have been acquainted with the anti-attrition metal of Isaac Babbitt, from its first intro-

duction. That when first my attention was called to it, I was quite skeptical as to its value; but at the earnest solicitation of the inventor, consented to give it a trial. I did so by applying it to journals which had given great trouble by heating, and to my great surprise, found that after being in use a short time, it had entirely overcome the difficulty, and that there was no further trouble from that cause.

Since that time, I have almost invariably made use of it, and always with the same good results.

In regard to the value of the invention, and its introduction to the public, it would be very difficult to make even an approximation, in dollars and cents; but the following statement may give an idea of it.

1st. It is valuable to the designer and constructor of machinery, as by its use he is, in many cases, enabled to dispense with the expensive composition boxes for journals; he is also enabled, when necessity requires it, to use a journal of very limited bearing, much more so than without its use.

2d. It is of great value to the proprietor of the machinery, not only in the economy of oil, and other lubricators, but the much less rapid wear of the machinery, repairs required much less frequently, and the consequent loss of time from these repairs much less; and where economy of first cost of machinery is important, much money can be saved by the use of this metal, in the place of compositions of copper and tin.

3d. To the attendant upon the machinery, it is very

valuable, as he is relieved, in a great measure, of the labor and anxiety which must ensue where there is a liability of journals to heat from the least negligence; he is enabled to keep the journals of his machinery in much better condition than he otherwise could do, and, of course, the friction is thus reduced to the minimum; and further, by its use he can entirely avoid the necessity of stopping machinery at a critical time, when it is all important it should not be stopped, and which otherwise he might be under the necessity of doing.

I do not hesitate to say, that to the country at large, the value of this invention has been many thousand dollars. I think I may say not less than two or three hundred thousand dollars, and when taken in all its bearings, are much more.

CHAS. W. COPELAND.

New York, May 20th, 1853.

City and County of New York, ss.

On this 21st day of May, A. D., 1853, before me came the within named Charles W. Copeland, who being by me duly sworn, did depose and say, that he has read the foregoing statement, and knows the contents thereof, and that the same is true of his own knowledge, and that he is not interested in the patent for the anti-attribution metal, or in the application for the extension thereof.

CHAS. W. COPELAND.

Sworn before me this 21st day of May, 1853.

SYLVESTER LAY,

Commissioner of Deeds.

AFFIDAVIT OF MIERS CORYELL,

Engineer of the Morgan Iron Works, New York.

I, MIERS CORYELL, about twenty-eight years old, am at present employed as engineer of the Morgan Iron Works, which employs about eight hundred men, chiefly in the building of Marine Engines, of the largest class. I was brought up as a practical machinist, and have had good opportunities of judging as to the merit of various contrivances connected with steam engines, and machinery generally.

I am well acquainted with the anti-attrition metal of Isaac Babbitt, and have seen it used and fitted up continually, during the last eleven years.

In the Morgan Iron Works, it has been used extensively during the last ten years, being used in all journals for revolving shafts.

I am of opinion it saves materially in friction, say thirty per cent.; that shafts wear longer, and are rendered more safe from the absence of wear, and their retaining their original sizes; their wearing surfaces became highly polished, and there is a material saving in oil from this cause.

I have known steamships upon which this metal has been used, to perform several voyages, embracing several thousand miles, without requiring the least tightening upon either crank-pins or shaft-journals.

In conclusion, I would state that I believe the invention was new when patented; that it is eminently useful

and practical, saving, yearly, thousands of dollars in my branch of business alone, and that the inventor deserves a liberal remuneration for it.

I am not in any way interested in the patent, or in the extension thereof.

MIERS CORYELL.

New York, May 17th, 1853.

City and County of New York, ss.

On this seventeenth day of May, A. D., 1853, before me came Miers Coryell, who, being by me duly sworn, did depose and say, that he has read the foregoing statement, and knows the contents thereof, and that the same is true of his own knowledge, and that he is not interested in the patent for the anti-attrition metal, or in the application for the extension thereof.

MIERS CORYELL.

Sworn before me this 17th day of May, 1853.

SYLVESTER LAY,

Commissioner of Deeds.

AFFIDAVIT OF HENRY B. RENWICK,

Inspector of Steam Vessels, under the Act of Congress of 1852, at New York, and late Principal Examiner of Patents, at Washington.

To all to whom it may concern, be it known that I, HENRY B. RENWICK, at present Inspector of Steam Vessel Machinery, under the act of Congress, approved August,

1852, and lately principal examiner of patents, have for many years past been acquainted with the contrivance known as Babbitt's anti-attrition metal, which is, in fact however, a method of supporting a soft and easily fusible alloy within a case of more refractory metal, so that said contrivance, as a whole, serves in place of the brass, or bell-metal boxes, usually employed in pillow-blocks or journals.

I have used this method in machinery owned by myself, and have carefully watched its action and effects, and am now engaged in building a feathering paddle-wheel, in which all the bearings are fitted in this manner. The contrivance has, as far as my knowledge extends, always acted to good advantage, has worn well, equally, and at the same time, slowly; and the shafts revolving therein become highly polished, almost like glass, so that there is a very material saving in oil, or other lubricators, in friction, and in wear and tear, and consequently expense of repairs. I cannot state the precise percentage of such savings, as I never made any accurate experiments.

I also know that it effects a very important saving in the fitting of journals, small ones especially. In such journals, no keys, no gibs, and no straps are needed, and the brasses are likewise dispensed with. All that is done is to ream out the interior of a cylindrical hole in the supporting arm or casting, so that the interior of the cavity has the largest transverse section; a mandrel of the size of the shaft is then introduced, and the alloy cast around

it. The mandrel is then withdrawn, and the journal-box is complete without further fitting.

The saving of each journal, thus fitted, amounts to from four to ten dollars, at a low estimate. Essentially, this same plan is employed in supporting propeller shafts, which are often of large size, within the tube, which passes through the dead wood of the vessel, and in that case, it would be almost impossible to employ any other method. Mr. Babbitt's contrivance is now in use in the largest shops in New York, and is applied successfully to the very largest and heaviest shafts, say fourteen inch wrought iron.

I do not, of own knowledge, know anything of the efforts of the inventor in introducing his invention, but judging from its almost universal use, both in shops which are paying for the patent right, and those which are not, I am of the decided impression that he has succeeded, in some manner, in impressing upon machinists generally the importance of using his invention. The fact being that its use, either with or without license, is almost universal.

I cannot state, in dollars and cents, the amount of saving, as based upon the economy in oil, the saving in wear and tear, in friction, and in original expense, when all the machines using it in the United States are taken into account, as I have no statistics of the value of the machinery employed. I have heard eminent engineers value it at from one hundred thousand, to two hundred thousand dollars, (say one to two hundred thousand dol-

lars,) and taking its great utility and extensive application into account, I do not deem the latter estimate at all unreasonable.

Neither do I know anything as to the amount received as remuneration, by the inventor; but am of opinion that if he has not received a sum approaching that amount, that the case presents good ground for a favorable decision upon the application for extension now pending.

I further believe, that the invention was new when patented; and am not in any way, directly or indirectly, interested in the patent or in the extension thereof.

HENRY B. RENWICK.

New York, May 26, 1853.

On this twenty-sixth day of May, 1853, personally appeared before the subscriber, a Commissioner of Deeds, in and for the city of New York, the above named Henry B. Renwick, and made solemn oath that the facts set forth, and opinions and statements herein made, are just and true, according to the best of his knowledge and belief.

SYLVESTER LAY,

Commissioner of Deeds.

AFFIDAVIT OF CHARLES H. HASWELL,

Late Chief Engineer, and Engineer in Chief in the U. States Navy, and now Surveyor of Steamers at the ports of New York, Philadelphia, Boston and Baltimore.

NEW YORK, April 30, 1853.

Regarding the application and value of the anti-attrition metal of Isaac Babbitt, I have to state,—That as a Chief Engineer, and as Engineer in Chief of the United States Navy, and for the last ten years as Surveyor of Steamers for the ports of New York, Philadelphia, Boston, and Baltimore, I have had full opportunities of witnessing both the operation, and the effects, of the use of this metal. My first experience with it was in the United States Steamers Missouri and Mississippi. The engines of these vessels having been fitted without it, and upon their first cruise, the journals of these engines, although their engines had been furnished by the days' work, and were fitted up in the best manner practicable, yet their crank-pins and shaft-journals heated to a degree that seriously arrested the operation of the engines, involving delay, and a great expenditure of tallow and oil; added to which, these steamers, being the first essays of the government for marine purposes, the result of the heating of the journals of the engines of these vessels was of so serious a feature, that it created a prejudice against the introduction of steam into the naval service, of so extended a character, as almost to arrest the further construction of steamers. Before the return of these vessels

to this port, in 1842, Babbitt's metal was applied to all the journals into which it was practicable to introduce it, and the result was that of signal success. I myself ran the engines of the Missouri, during a cruise in the West Indies, without heating a journal. Since this period, I have designed and directed the construction of nineteen marine engines, and in every instance I have used the metal of Mr. Babbitt; and am of the conviction that an engine without it, is not fitted with due regard to economy of operation, or efficiency of action.

As regards the value of this metal, in its economical effect to the owners of engines and machinery throughout the United States, it is very difficult for any one to arrive at any estimate with precision. A mere exponent of the extent of its utility can alone be given; thus, in my opinion, it has saved, since its first introduction, in time, repairs, and lubricating materials, fully two hundred and eight thousand dollars, say \$208,000, which is the moderate allowance of only twenty dollars per annum upon the engines of two hundred steamers, (three hundred and fifty engines,) and of ten dollars upon seven hundred and fifty locomotives and stationary engines, and of five thousand dollars for machinery purposes.

CHAS. H. HASWELL,

Marine Engineer.

City and County of New York, ss.

On the twenty-ninth day of April, A. D. 1853, before me came Charles H. Haswell, who, being by me duly

sworn, did depose and say, that he has read the foregoing document, and knows the contents thereof, and that the same is true of his own knowledge, except as to the matters and things which are therein stated on information and belief, and as to these matters, he believes it to be true; and that he is not interested in the patent of the anti-attribution metal of Isaac Babbitt, or in the application for a renewal of said patent, directly or indirectly.

J. R. FLANNIGAN,

16, Wall Street.

Commissioner of Deeds.

AFFIDAVIT OF CYRUS ALGER,

The celebrated Iron Founder, Boston, Mass.

I, CYRUS ALGER, of Boston, in the State of Massachusetts, on oath declare and say,—That I have known Mr. Isaac Babbitt, patentee and inventor of “an improved mode of making Boxes for Axles and Gudgeons,” for many years.

He is a man of rare talent, skill, and science, as a practical worker in metals, and a man of great perseverance and energy, and of undoubted integrity. Any statement made by him may be fully relied upon.

I have some knowledge of Mr. Babbitt’s invention, and have made use of it in my business. I believe it to be an invention of very great utility, value, and importance,

and one which should entitle the inventor to the highest remuneration therefor. I have no personal interest in the patent; but would gladly see it extended to Mr. Babbitt, as a just reward for his labors.

[Signed,]

CYRUS ALGER.

Commonwealth of Massachusetts.

Suffolk, ss. April 16th, 1853.

Then Cyrus Alger made oath to the truth of the foregoing certificate, by him subscribed before me,

H. MONTGOMERY,

Justice of the Peace.

AFFIDAVIT OF O. D. MUNN,

Proprietor of "The Scientific American," New York City.

I, ORSON D. MUNN, of the city of New York, on oath depose and say,— That I have, for many years, devoted a great portion of my time to the subject of mechanics. That I have been engaged, for the last seven years, in the business of examining machinery, and in procuring patents therefor. That I have also dealt somewhat largely in the purchase and sale of machinery, of different kinds, and have had occasion to know and understand about the practical operation of locomotive and marine engines,

steam vessels, and other machinery. That I am acquainted with Isaac Babbitt's patent for an improved mode of making Boxes for Axles and Gudgeons; and I deem the invention one of very great merit and value, and of high practical utility and importance, and one which, although introduced, at first, into practice, with difficulty, has become of almost absolute importance and necessity to the successful operations of heavy machinery, and the reliable and rapid propulsion of locomotives and steam vessels.

As a means of diminishing friction, and preventing the wearing and heating of axles, journals, and bearings, and also of saving large expense in the use of lubricating materials, I deem it also of very great value and importance. It is impossible to fix a value upon the invention, as it is one which, as at present used and needed, could not well be dispensed with, unless some new matter could be found to take its place. The inventor, in my judgment, is well entitled to a large remuneration for that which has proved to be of such vast utility, value, and importance to the public.

[Signed,]

O. D. MUNN.

City and County of New York, ss.

Sworn before me, March 19th, 1853.

M. S. BREWSTER,

Commissioner of Deeds.

AFFIDAVIT OF ROBERT McFARLANE,

Editor of "The Scientific American," New York City.

I, ROBERT McFARLANE, of the city of New York, on oath declare and say,— That I have been, for many years, practically acquainted with mechanics and machinery, and the workings and operations thereof. I have made the science of mechanics, and the scientific, as well as practical, operations of machinery, my study for a long time. I have a knowledge of Isaac Babbitt's patent for "an improved mode of making Boxes for Axles and Gudgeons," granted in 1839. And I know that his invention is a vast improvement over the old brass and gun-metal bearings, for machinery. That it wears far longer, and is attended with very little friction. It has effected a great saving of power, by decreasing the amount of friction in the axle boxes of locomotives, the axles of which are driven at such high rates of speed. Its advantages are incalculable, both as it regards a saving of lubricating materials, and the prevention of the heating of journals and axles, the latter of which, viz.: the heating of journals, has been the cause of frequent stopping of trains, the and binding of axles and shafts, the frequent setting fire to cars, while running at a high rate of speed, to the great danger of the lives of passengers. Without it, the successful and uniform operations and workings of locomotives and steam vessels, would be entirely uncertain, and liable to interruption.

It has come to be considered and felt as almost, if not

quite, indispensable to all heavy machinery, and when there is much amount of strain and wear upon axles, journals, crank-shafts, and connecting-rods, upon its value, usefulness, and importance, no estimate can be put.

In my judgment, the inventor should be highly rewarded, as it has been the means of decreasing the cost of running machinery; enabling machinery to be run at higher rates of velocity, and has increased the safety of life and limb; and, in fact, rendered certain, in the running of machinery, what was before uncertain. The highest remuneration is due to one who invents that which is of such great utility, value, and importance.

[Signed,]

ROBERT MCFARLANE.

City and County of New York, ss.

Sworn before me, March 19, 1853.

M. S. BREWSTER,

Commissioner of Deeds.

AFFIDAVIT OF N. MONROE,

Agent of the Philadelphia Oil Company.

I, NATHANIEL MONROE, of Boston, Massachusetts, on oath depose and say,—That until within a few years past, I have been for more than twenty years a practical mechanic, and have been in the habit of examining machinery

of various kinds. Within a few years past, I have had occasion, from my business connections, to examine the bearings of machinery, and matters connected with the running of axles and gudgeons, and crank-shafts and pins, in various places, and of various descriptions, having reference to the cheapest and best mode of lubricating and running the same. I am acquainted with Isaac Babbitt, patentee of "an improved mode of making Boxes for Axles and Gudgeons," and have known him for several years; I am also acquainted with his said patent.

As a mode of preventing heating, abrasion, and friction of the revolving and bearing parts of machinery, and of saving in the use of lubricating materials and repairs, I deem his invention to be a great desideratum, and one which, from my own experience, observation, and inquiry, I believe could not now be dispensed with. It has come, from its own intrinsic usefulness and importance, to be a necessary in all machinery, where there is much wear or strain. Its value I believe to be absolutely incalculable. Mr. Babbitt is a man of great industry, skill, and truthfulness, and his statements may be fully relied upon. He has been diligent in his attempts to introduce his invention into general use, and to secure to himself a fair remuneration therefor; but in the early part of the period of his patent, he labored under great disadvantages, and was obliged to be at great expense in so doing. I am knowing to the value of Mr. Babbitt's property, and I am of the opinion that, taking all the property of which he is now possessed, (and a large portion of it has been de-

rived from sources other than his said patent,) at its highest value, Mr. Babbitt would have received a remuneration wholly inadequate to the value, usefulness, and importance of his invention. And he has made no losses by speculations or bad investments, of what he has received. I am not interested in any way in said patent.

[Signed,]

NATHANIEL MONROE.

Commonwealth of Massachusetts. Suffolk, ss.

March 29th, 1853. Sworn to before me,

C. DEMOND,

Justice of the Peace.

AFFIDAVIT OF JAMES BLAKE,

Massachusetts.

I, JAMES BLAKE, of Newton, Massachusetts, on oath depose and say,—That I know Mr. Isaac Babbitt, inventor and patentee of “an improved mode of making Boxes for Axles and Gudgeons,” and have known him for many years. He is a man of rare knowledge and skill, as a scientific and practical worker in metals, and of great industry and integrity. Any statement made by him may be fully relied upon as true. His acquirements and capabilities have been, and are such, that he could, in my judgment, at any time during the last fourteen years, have commanded a high price for his services, and without

doubt, could have received at least two thousand dollars per annum, if he had chosen to employ himself for wages. I should think *that* a sum smaller than the real value of his services, and time, and skill. I knew Mr. Babbitt well at the time when he procured his said patent, and I knew of the great exertions which he made to introduce his invention into notice and use, and the difficulties and embarrassments which he encountered in so doing. I built for him his first shop, and I lent him money from time to time, to enable him to prosecute his business. He was untiring in his efforts to bring his invention into notice, and took unwearied care and pains to induce persons and corporations to test it, and to introduce it into practical use. He found great difficulty in persuading those who would be most benefitted thereby, of its great utility and value, and he was obliged not only to manufacture, and give away largely, but even to introduce it by stealth into machinery, in order to induce others to adopt and use his invention; and in his efforts and labors, he not only expended all the means which he at first had, but fell largely in arrears, while pushing the thing forward. He frequently became quite discouraged, and disheartened; but the consciousness that his invention was actually of such vast utility and importance, combined with great energy and perseverance, enabled him to overcome difficulties that would have deterred others from any further effort.

I know of and about Mr. Babbitt's said invention, and I believe it to be of as much actual practical benefit to

the community, as almost any for which a patent has ever been granted. Its value, utility, and importance, as connected with the running parts of all heavy machinery, locomotives, rail-cars, steam engines, steam vessels, and in all cases where there is large strain or wear, or where high rates of speed are desired, I believe it to be actually incalculable. It prevents abrasion and heating of the parts, greatly diminishes friction, and occasions an immense saving of expense in repairs and lubricating material, while it relieves from anxiety, and greatly increases the safety of life and limb.

From my knowledge of Mr. Babbitt, I believe that he has used all diligence in bringing his said invention into general notice and use, and in endeavoring to procure a proper reward therefor, without, however, as regards the latter, meeting with the success that the value of his invention ought to have insured. To the best of my knowledge and belief, and according to such information as I have, — and I have known him, and about him, pretty intimately, — Mr. Babbitt has not realized a remuneration at all adequate to the importance of his invention. I am in no way myself interested in his patent, nor do I expect to be, either directly or indirectly.

[Signed,]

JAMES BLAKE.

Commonwealth of Massachusetts. Middlesex, ss.

March 29th, 1853. Sworn to before me,

HORACE R. WITHERELL,

Justice of the Peace.

AFFIDAVIT OF WM. A. PIERPONT,

Machinist and Engineer.

I, WILLIAM A. PIERPONT, of Boston, in the State of Massachusetts, on oath depose and say,—I am a practical machinist and engineer, and I have been in the business for twenty-five years. I know Mr. Isaac Babbitt, the inventor and patentee of “an improved mode of making Boxes and Gudgeons,” and I have known him for twenty-five years past. He first invented the mode of making Britannia ware in this country, and made a successful application thereof, without any foreign aid. He has also made many other very useful and valuable inventions, and has contributed largely to the advancement of the arts and sciences in this country. He is a man of great industry and perseverance, and of the greatest honesty and truthfulness of character. And any statement made by him may be implicitly relied upon as true.

He is a man of rare acquirements and skill as a practical chemist, and assayer and metallurgist, and of the most undoubted capacity as a worker in metals. His talents and capabilities would entitle him to the highest compensation for his time and services, and for the last fourteen years, he could, in my opinion, readily have commanded from two to three thousand dollars per year, for his time and services alone. I know of his invention for making boxes for axles and gudgeons, for which he obtained a patent in July, A. D. 1839. I was with him personally from September, 1841, to November, 1846, and knew of his business and movements.

Prior to his invention, it was a matter of great difficulty, and almost impossibility, to run heavy engines, marine and locomotive, or to run any engines at a high rate of speed, with any certainty as to time or endurance, from the constant heating and abrasion of the axles, gudgeons, journals, crank-pins, and shafts, and a large amount of force was required to overcome the friction, and great expense was attendant upon the furnishing of lubricating materials, and the constant repairs necessary to keep the machinery in running order. In addition to all this loss of power and great expense, the management of such machinery occasioned a constant anxiety, lest danger and damage should occur.

To obviate these and other difficulties, Mr. Babbitt, after experimenting, invented his mode of making boxes, for which he obtained his patent. The consequences of his invention have been greatly to diminish the friction of the running and rubbing parts of machinery, to obviate almost entirely the heating of said parts, to save vast amounts of lubricating materials, and to prevent wear and tear, and consequent expense for repairs, to a very great degree. The power of machinery and its capacity have been greatly increased, so that engines, marine and locomotive, will not only carry heavier loads, but at a far higher rate of speed. I do not believe that the invention could now be dispensed with. It has come to be an absolute necessity, and a steamship, or a locomotive, or heavy steam engine, could not be operated with certainty, speed, or safety, without it, or something equivalent to it.

I deem its value to be absolutely incalculable. The United States paid Mr. Babbitt \$20,000 for the use of his patent; but I will venture to say, that the saving to government by this means, as regards three steamships alone, in the United States Navy, into which it was at first introduced, has already been far more than the whole sum paid Mr. Babbitt.

No man would now build a steam-vessel without it.

As its value, usefulness, and importance to the public are incalculable, as regards capacity, economy, speed, reliability, and safety, in matters connected with machinery, so the remuneration to Mr. Babbitt for such an invention ought to be in some measure commensurate. On the contrary, however, his remuneration has been miserably small, and hardly beyond what he might have otherwise realized, without the labor, anxiety, and expense he has bestowed, for so many years, upon this most useful invention. Being with Mr. Babbitt in his foundry and shop for so many years, I know of his efforts to introduce his invention into general use. It was a matter of great difficulty to overcome the prejudices of those who ought to have been, and now are, most interested in the invention, and who have been most benefited thereby.

It was necessary for Mr. Babbitt to go to great expense in building, and in procuring the means for manufacturing boxes, and to expend much time and money in the manufacture of work, that he might present it already fitted and ready for use. He could not explain his invention, so that the prejudiced persons would understand and adopt it.

He was obliged to make his work, and then beg others to try it, and in some cases, smuggle it into actual use, before he could persuade others of its great importance and value. His labors and efforts were unceasing, and his discouragements were great and almost overwhelming.

But he was so much and so fully satisfied of the actual intrinsic value of his invention, that he persevered in the face of obstacles which would have broken down almost any other man. Had it not been for pecuniary assistance rendered by his friend, Mr. Blake, and subsequently for the aid which he derived from the amount which was paid him by government, he would have been utterly and hopelessly bankrupt, as he had already expended far beyond his means, in his efforts to introduce his invention into use. We made large amounts of work in weight and value, which Mr. Babbitt gave away to railroads and manufactories, to induce them to try the invention. He was obliged to solicit the privilege of putting in boxes into locomotives and other engines, with the agreement that if they did not work well, he would take them out, and replace them with the old kinds, without expense. He gave large amounts to the United States, and I believe that all that was at first used in the Mississippi, Missouri, and Princeton steamers, was by him furnished without expense.

Mr. Babbitt's expenses connected with his foundry, and shop and furnace, and the manufacture of carriage work,

were very large, necessarily, and he was obliged to work at a disadvantage, with the hope of eventually realizing from proceeds of sale of his patent, rather than from the sale of work made by him. The work which he made was of a high character and finish, and, in my judgment, he was instrumental in raising the quality of brass and composition castings in this country, from fifty to one hundred per cent above what they previously were; that is, by his efforts, and by the means of the superior quality of the work he made, the general character of such work was greatly elevated above the former standards. Mr. Babbitt's legal expenses were also heavy, and his family expenses by no means small. In my judgment and to my knowledge, Mr. Babbitt used all due diligence in his efforts to introduce his invention into general use. I know of his receipts for his invention, and, in my opinion, his whole remuneration is altogether inadequate to the great value and importance of the invention to the public. Two hundred thousand dollars would be a sum small enough to reward him for all his toil, and labor, and anxiety, and time, and services, when the vast usefulness and value of his invention is considered. The saving to the United States Government, in the matter of oil alone, by the use of his invention, would amount, in my judgment, to more than all his receipts for his patent.

I am in no way interested in said patent, nor in the extension thereof, nor do I expect to be; but I should be

glad to see said patent extended to Mr. Babbitt, as an act of justice, to which he is well entitled.

[Signed,]

WM. A. PIERPONT.

State of Massachusetts, Suffolk, ss.

April 15th, 1853. Sworn to before me,

C. DEMOND,

Justice of the Peace.

The patent of Mr. Babbitt has been sustained in the courts both in the United States and of Great Britain. In June, 1845, a trial was had in the United States Circuit Court, in the Northern District of New York, in favor of Mr. Babbitt, against certain parties infringing upon his patent, which resulted in a verdict of \$4,500 for the Plaintiff, as appears from the certificate of the clerk of said Court, annexed.

To all to whom these presents shall come, Greeting:

Know ye, that I, AUGUSTUS A. BOYCE, Clerk of the Circuit Court of the United States, in and for the Northern District of New York, in the Second Circuit, having inspected the records, files, and minutes of proceedings of and in my said office, do find the following facts:

“UNITED STATES CIRCUIT COURT.

Northern District of New York.

ISAAC BABBITT,

vs.

THE BUFFALO STEAM ENGINE WORKS.

This was an action commenced on the 25th day of June, 1844, by the Plaintiff against the Defendants, for an infringement by Defendants, of Plaintiff's Patent Right, for an improved mode of making boxes for axles and gudgeons, issued July 17, 1839: said action was entered at the June Term of said Court, and Defendants having entered their appearance, and filed their pleadings, the case came on for trial to Jury, at Canandaigua, in said District, on the 19th day of June, 1845, and, upon the evidence, the jury found for the Plaintiff, and awarded damages four thousand five hundred dollars, (\$4,500) in favor of the Plaintiff, and against the Defendants.

In Testimony Whereof, I have hereunto subscribed my name, and affixed my official seal, at the clerk's office, in Utica, in said District, this 30th day of September, in the year of our Lord, one thousand eight hundred and fifty three, and of our Independence the seventy-eighth.

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 X SEAL. X
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AUGUSTUS A. BOYCE.

Clerk."

EXTRACTS FROM LETTERS, &C.

THE following are some extracts from the letters of the distinguished counsel of the Defendants, in that suit, to his clients ; which, upon final settlement, were furnished to Mr. Babbitt.

Canandaigua, June 18th, 1845.

Gent. — Mr. Babbitt is on the ground with a large number of witnesses, and well prepared to try his cause. He has taken the depositions of our New York witnesses, and knows exactly what they will swear to. Our Buffalo witness, Ayers, as the time approaches, begins to recede from his position, and I have no confidence that he will do us any good. After the closest scrutiny and examination, I have no confidence that we can defend successfully. Supposing that we might make better terms with Babbitt, I moved the cause over, this morning, which, you know, requires us to pay the costs of the term. The costs are very heavy, and we cannot, at next term, be any better prepared than we are now, and it would be throw-

ing away money to pay them. In fact, his patent is a *new and useful* invention, and we have violated it, and it is of no use to try to get rid of the consequences.

In taking this course, I have advised with your Secretary, Mr. Warren, and your President, Mr. Williamson, who concur with me in opinion.

I will write you again after the cause is tried.

To the Buffalo Steam Engine Works, Buffalo.

Canandaigua, June 19th, 1845.

Gent.— Your cause was reached, and the plaintiff took a verdict for \$4,500, which, under the proof, is moderate. I watched Mr. Stevens' proof, and it was conclusive in every point; our witnesses could not have shaken it in the least. Babbitt seems to be a fair man; but will fight to the last for his rights. He has money, perseverance, and witnesses, and it would cost one more to litigate and beat him, than to buy his right. You will be able to judge how dreadfully expensive litigation in this court is, when I tell you that the witnesses fees alone, taxed against us for this term, amount to more than \$500.

Your only method now is to deal gently and fairly with Mr. Babbitt, and I think he will not be hard with you.

To the Buffalo Steam Engine Works.

The whole matter was subsequently compromised, and the defendants purchased a license of Mr. Babbitt.

Another suit was commenced against the Attica and Buffalo Railroad; but the Company came forward and purchased a license, and the suit was dropped.

A third suit was brought against the Boston Mill Dam Company; but that also was settled by the Company without a trial, and a license purchased.

The same matter was also tried in England, in 1845, and with a similar result. A patent for the "improved mode of making Boxes for Axles and Gudgeons," was granted in England, to Mr. Newton, agent of Mr. Babbitt, in 1843, and at the Liverpool Summer Assizes, the case of *NEWTON, vs. THE GRAND JUNCTION RAILWAY COMPANY*, was tried; being an action brought against the Defendants for an infringement of said patent. After a long and very hotly contested trial, the jury rendered a verdict sustaining the patent, and awarding the Plaintiff damages to the amount of £1,000, or \$5,000. The most eminent counsel were retained in the case, and upon a subsequent hearing before the Court of Exchequer, for a new trial, in January, 1846, the judges fully sustained the verdict, and the motion for a new trial was overruled.

The case is reported in the 6th volume of English Law and Equity Reports, p. 557, to which reference may be had.

OPINION OF COUNSEL UPON THE PATENT.

Boston, *October* 20, 1853.

DEAR SIR:—I am requested by my client, Mr. Isaac Babbitt, to submit to your consideration his patent for an improved mode of making Boxes for Axles and Gudgeons, issued July 17, 1839, and extended for seven years from July 17, 1853. My own opinion is very decided in favor of the originality of the invention, the utility of the improvement, and the validity of the patent, and is equally decided as to what may constitute an infringement. Will you, however, give the subject your attention, and express to me your views in writing, after carefully considering the claims made by my client, and the facts which I have had the honor to submit to you heretofore, regarding Mr. Babbitt and his connection with this invention.

Respectfully yours,

A. B. ELY,

52 Washington Street.

TO WILLIAM WHITING, ESQ.,

Counsellor at Law,

35 Court Street.

BOSTON, *November 10, 1853.*

DEAR SIR: — After thorough investigation of the facts relating to the origin and development of the improvement of Mr. Isaac Babbitt, and consideration of the questions upon which (in behalf of your client) you desire my opinion, I am prepared to state the following conclusions.

1st. That the patent, the addition thereto, and the extension of both, are in due form of law, and are valid.

2d. As to the utility of the improvement, its almost universal adoption in Europe and America, upon a great variety of machinery, including steamboats, locomotives and cars, stationary enginery, and in short upon nearly every description of bearings in which great weight or great speed is desirable, is sufficient and conclusive evidence. The appropriation of \$20,000 by Congress, the extension of the patent by the Commissioner of the United States, and the testimony of machinists, engineers, and scientific men, put at rest all doubt as to the utility or value of the invention secured by the letters patent.

3d. Whenever any new and important discovery has been made, and has proved successful, some persons are always found who are ready to set up claims to a priority of invention. The electric telegraph, the ether discovery, are recent instances; and in earlier times, the steamboat, the cotton-gin, the hot-air blast furnace, the application of anthracite coal to the manufacture of iron, will furnish further instances of the same description of unfounded pretensions.

The question which arose in all these cases was, not

whether, in some solitary instance, an individual may have tried experiments, (successful or not,) — leaving the alleged invention undeveloped, or immature and fruitless,—but whether, previously to the patentee, any more fortunate person had fully completed the invention, and by introducing it into public use or notice, had thus practically added to the stock of knowledge, that which was not known before?

So in the present case, when we observe the striking effects of Mr. Babbitt's improvement upon the machinery of this country and of England, the great saving of oil and of other lubricating material, the extent and variety of uses to which it has been applied, and the unanimity of opinion among practical men, in regard to the importance and value, as well as the simplicity of the invention, it would be strange if some person did not appear who would, as usual, set up the old pretence that *he* knew all about the matter long before Mr. Babbitt's day!

But if this were in fact the case, why was the invention, at once so simple and so valuable, indeed so indispensable—if it was really made, and understood by the pretended inventor—allowed to be thrown aside, forgotten, or abandoned? not used, brought forward, taken up and made public as it *was* by Mr. Babbitt; and perhaps by these very pseudo inventors, *after* Mr. Babbitt had taught them what the invention was?

Every case where priority has been claimed by any person, has been investigated by the patentee or his agents, (wherever they have had opportunity,) and in

every instance it has turned out that the alleged claims were unfounded.

This pretended defence of want of novelty and originality of invention has been the subject of judicial investigation in the highest courts of England and the United States, and in both countries the courts and juries have decided in favor of the patent. And there has been, for many years, an almost universal acquiescence in the justice of Mr. Babbitt's claims, by a vast number of individuals and corporations, in various parts of the country, who have held licenses or grants under the patentee, and who are thereby estopped from disputing the validity of his claim.

Under these circumstances it seems difficult to imagine a case in which a patent can stand upon a firmer or broader basis, so far as relates to the question of the novelty and originality of the invention.

4th. In relation to the subject of infringements, you are aware that, in order to render a defendant liable to damages, it is not necessary to show that he has used exactly the same mode shown in the patent, for holding the soft metal in its place; whatever is substantially the same mode as that prescribed or recommended in the patent will, if used, be an infringement.

In the case tried in England, *no flanges* whatever were used by the defendants; but they substituted a contrivance which was a mere equivalent, and were, therefore, found guilty. There are various evasions of the patent, which are palpable infringements, some of which have

been recently brought to my notice ; such as holding the soft metal in place by running it into holes, or small cavities, of regular or irregular shapes ; the use of narrow longitudinal strips of soft metal alternating with hard metal ; the hammering of the soft metal into the boxes, instead of running it in, or causing it to adhere by the tinning process ; the use of any description or shape of the hard metal, whereby the lining is prevented from leaving its true position, by lateral pressure or resistance of the hard metal, which constitutes the substance of the box or bearing. All these, and similar modes of obtaining the beneficial results of Mr. Babbitt's invention, are plain and gross violations of the rights secured to him in the letters patent.

Respectfully yours,

WILLIAM WHITING,

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A. B. ELY, Esq.,

Counsellor at Law.

DIRECTIONS

For preparing Babbitt's Anti-Attrition Metal for lining Boxes.

In the first place, I melt four pounds of copper, and when melted, add by degrees, twelve pounds best quality Banca tin, then add eight pounds regulus of antimony, and then twelve pounds more of tin, while the composition is in a melted state.

After the copper is melted, and four or five pounds of tin have been added, the heat should be lowered to a dull red heat, in order to prevent oxidation; then add the remainder of the metal, as above named.

In melting the composition, it is better to keep a small quantity of powdered charcoal in the pot, on the surface of the metal.

I make the above composition in the first place, which I call hardening; then, as I want to use for lining work, I take one pound of the hardening, and melt with two pounds Banca tin, which produces the lining metal I now use, which I consider the best I have ever used. So that the proportions for lining metal is, four pounds copper, eight regulus of antimony, and ninety-six pounds tin.

The object I have in first preparing the hardening as above mentioned, is economy; for when the whole is melted together, I find there is a great waste of metal, as the hardening is melted at a much less degree of heat, than the copper and antimony separately.

I find, in my practice, that in melting the lining metal, or tin for tinning the boxes, there is some oxidation on the surface of the metal, which should be skimmed off. This oxide I save, and when I get a quantity, put it into a black lead crucible, add about one-tenth in bulk of pounded charcoal, expose it to a smart red heat, which brings it back again to metal fit for use.

The box or article to be lined, having been cast with a recess for soft metal, is to be nicely fitted to a former, which is made the same shape as the bearing, except being a hair larger than the bearing.

Drill a hole in the box for the reception of the metal, say half or three-quarters of an inch, according to the size of the box. The box having been thus prepared, coat over the part not to be tinned with a clay wash; wet the part to be tinned with alcohol, and sprinkle on sal ammoniac, ground as fine as common table salt. Heat the box till a fume arises from the sal ammoniac, and immerse it in a kettle of Banca tin melted, care being taken not to heat it so that it oxidises.

After the box is tinned, should it have a colored appearance, sprinkle a little sal ammoniac, which will make it of a bright silver color, and cool it gradually in water; then take the former, to which the box has been fitted,

and coat it over with a thin clay wash, and warm it so that it will be perfectly dry; heat the box until the tin begins to melt, lay it on the former, and pour in the metal, which should not be so hot as to oxidise, giving the metal a head, so that as it shrinks it will fill up.

After it is sufficiently cool, take it off the former and scour the box, so that there may be no sand or dirt on it, which would injure the bearing.

P. S.—A shorter method may be adopted when the work is light enough to handle quickly, viz.: when the box is prepared for tinning, it may be immersed in the lining metal instead of the tin, brushed lightly, in order to remove the sal ammoniac from the surface, placed immediately on the former, and lined with the same heat.

The Patent Boxes are used on almost all the railroads and steamboats, and in almost all the machine shops in the country; a large portion of which purchased rights of Mr. Babbitt for the use of his patent, during the original term thereof, which expired July 17, 1853.