is very clear from the testimony that he has failed. There are several witnesses, practical farmers, who used the machine as constructed under the patent of 1845 and who declare that in lodged or tangled grain it was wholly inefficient, unless the grain chanced to lean towards it; that the reel was constantly stopping, and that the machine would not cut the grain, but would run over it. This divider, within its own narrow track of twelve inches, certainly lifted and parted the fallen grain, and thus secured the uninterupted progress of the machine; but the same result had been effected—possibly under peculiar circumstances, not quite so well—by other and well-known dividers, among which may be specially named that of the applicant, as appearing in his patent of 1834. For the broad pathway of the cutter, having a width of five or six feet, no provision was made by the invention of 1845 for lodged or tangled grain, beyond the pre-existing imperfect instrumentality of the reel.

The applicant's invention of 1845, as set forth in his reissued patent of 1858, consists of two points:

1st. The curvature of the bearers supporting the cutter apparatus, which, it is insisted will facilitate the discharge of any clogging matter that may enter. It is presumed that this improvement upon the straight bearer formerly in use has a measure of utility; but as it has not attracted the special attention of the witnesses or counsel, it will be dismissed without further comment.

2d. "The employment of the projecting ends of the reel-ribs to affect the separation of the grain to be cut from that to be left standing, in combination with a dividing apparatus, which effects a division of the grain by forming an open space between the outer and inner grain for the ends of the ribs of the reel to act in, in which open space there is no reel-post, or other obstruction, to prevent the free passage of the grain as it is brought back by the ends of the reel-ribs to the platform of the machine, and by which means a separation of the inside grain to be cut from the outside grain to be left standing is made complete by the action and power of the reel."

The "dividing apparatus" referred to consists of a device substantially the same with that previously in use, with this exception, that a crooked iron rod is employed to secure the same divergence on the inner side, which had been previously effected by the inclined edge of the well-known wedge-shaped divider. It probably secured but little, if any, greater divergence than the old device, nor could this have been done without resulting in throwing so much grain between the first pair of fingers of the cutter as to choke it at that point. This feature of the divider was, however, new in form, and presented a further marked trait of novelty in its adjustability, as to height, by means of a slot and screw-bolt. The invention of 1845 consists, then, in a curvature of the bearers and the combination of this precise form of divider just described, with the projecting ends of the reel-ribs, for the purpose of separating the grain. The patentability of this improvement having been recognized by this office and the Supreme Court, it will be treated in this discussion as a settled question.

The inquiry which remains to be prosecuted is, whether the patentee, after the exercise of due diligence, has failed to receive a reasonable remuneration for the time, ingenuity, and expense bestowed upon this invention and upon its introduction into public use. In order satisfactorily to answer this inquiry, it must be ascertained—

1st. What are the profits which the patentee has realized from the sale and use of the invention? and

2d. What is the actual value of that invention, considered as well in reference to its intrinsic character as to the benefits which it has conferred upon the public?

The applicant, in addition to this invention, made a further improvement upon the reaping machine which was patented in 1847, and which consisted in combining a raker's seat with the machine as constructed under the patent of 1845. Having in all the machines and licenses sold by him united the privileges and devices of the two patents of 1845 and 1847, without any designation of their respective values, he has in his account filed, presented the aggregate receipts and expenditures accruing from them both, and has there assigned a moiety of the profits to each of the patents. The gross receipts thus presented amount to $2,868,780. From this, however, must be deducted the $9,354 05 received from Seymour & Morgan, which being proceeds of a judgment against them for infringing the patent of 1845, cannot be properly divided with that of 1847. The proof shows that this exhibit of receipts is not free from errors, but the inaccuracies disclosed are not of a magnitude to justify any special notice.

The gross expenditures are set down at $2,732,035 73, which being deducted from the alleged receipts, yields a profit of $136,-744 27 for the two patents, or $68,372 13 for each of them. A critical examination, however, of the details of this account, as seen especially in the light of the testimony, has led my mind to a very different conclusion as to the amount of profits with which the patent of 1845 should be credited. The items of expenditure will be noticed in he order in which they stand.

The sum of $45,360 is charged as an average interest for fourteen years on the amount debited to the patents of 1845 and 1847, for money expended in experimenting with machines, in traveling, and otherwise prosecuting the invention. This interest was extinguished by the accruing profits, and could not be allowed, unless interest was calculated upon the receipts. As this has not been done, and if done, would exhibit a heavy balance on the other side, this item must be rejected.

There is charged the sum of $93,600 for expenses of litigation, which is stated to have consisted in "three cases that were carried to the Supreme Court, and several others in the circuits." No intimation is given as to the precise purposes for which this large amount was expended. It may have been absorbed by counsel and witness fees, and costs of court, or by something else which the applicant may have regarded as embraced in the comprehensive term "litigation." Neither the names of the parties to the suits, nor the date of their pendency and decision, nor the courts by which they were determined, are given, beyond the general statement that there were several suits in the circuit courts, and three in the Supreme Court of the United States. Certainly nothing could be more indefinite or unsatisfactory. The statute, in requiring the patentee to make a true and faithful exhibit of his receipts and expenditures, clearly intended that his account should assume such a form as would enable the public to investigate it and contest its accuracy, if inclined to do so; such a form too as would place it in the power of the Commissioner to pronounce upon its intrinsic legality, and apply the testimony offered for and against it. Some relaxation of the rigor with which certainty is exacted in all accounts that propose to become the basis of judicial action, has been recognized as proper in behalf of inventors because of their peculiar character. The utmost relaxation, however, of the rule could not sanction a statement so utterly vague as that under consideration. The transactions covered and concealed by its ample folds are without any ear-mark or designation whatever, which could render it possible for the Commissioner or the public to examine them. It may be safely added, that the applicant is not in a condition to claim the benefit of any such relaxation of the general principle referred to, as is insisted on his behalf. He is an inventor, it is true, but, unlike the class to which he belongs, he is also a man of remarkable business habits, who wields millions of capital, is surrounded by his agents and clerks, and keeps the records of his vast transactions with strict commercial accuracy. Had he therefore chosen to open his ledger for our inspection, it would no doubt have exhibited an account of his "expenses for litigation," as complete as that presented by the merchant's books of his daily purchases and sales. With such lights at hand, the applicant's pressing upon our consideration an account so obscure and darkened as this, is wholly without excuse. This item must be disallowed because of its indefinite character, and for the further and all-sufficient reason, that there is no testimony in the case showing, or tending to show, that this amount, or any part of it, was ever expended for the purpose charged.

Next follows an item of $511,750 67 for the transportation of machines and commissions upon their sale. The proof is very full to the effect that the general rule, as announced in the printed circulars of the applicant, was that the cost of transportation should be paid by the purchaser, and this requisition seems to have been rarely departed from. Metcalf, one of applicant's witnesses, thinks that in not more than one case in fifty or sixty, was an exception to the rule allowed; other witnesses say that the freight and charges were invariably collected of the purchaser on the delivery of the machine. There are others who think that this was not insisted on in all cases, as in a certain locality in Illinois, during the year 1855, it is stated that $5 of this expense was paid by the purchaser, and the rest, if anything, by applicant. The few isolated instances in which the cost of transportation was borne by the applicant, not having been pointed out with any reasonable degree of certainty, this portion of the charge must be rejected. Calculating the commissions at ten per cent. on the gross amount of the sales—which is a most liberal allowance—the result will give for this item $283,398 instead of $511,-750 67.

I am wholly at a loss to perceive on what ground the charge of $493,808 52 for "manufacturing profit" can be sustained. The estimate is made at 30 per cent., which is ten per cent. higher than the testimony would warrant, supposing such profit properly chargeable against the patent. The statute in imposing on the patentee the duty of exhibiting a "faithful account of the loss and profit in *any manner* accruing to him from and by reason of his invention," manifestly designed that such loss and profit "should be taken into the estimate in determining the reasonableness of the remuneration received. The patentee may sell his invention or he may use it, either in operating machines made under it on his own account, or in manufacturing such machines and selling them to others. If he pursues the latter course, all profit remaining to him after meeting—what has been so liberally allowed in this case—the interest on the capital invested, and the loss from wear and depreciation of machinery, must be set down not to the debit but to the credit of the patent. Such was the doctrine announced, though not elaborately discussed, by Commissioner Hodges in 1852, on application for the extension of a patent granted to Goodyear, as assignee of Hayward, and it would seem that no other conclusion could be safely drawn from the emphatic and comprehensive words of the statute. This item must, therefore, be stricken from the account.

Of all the details of this extraordinary account, the $359,908 80, set down to the debit of the patent "for loss on debts," is the most remarkable. The books of applicant, as proved by Blakesley, his clerk, who had charge of them, show that on $2,758,900 43 of sales, the "worthless notes and accounts" amounted to but $23,-553 67; and yet, on an outstanding indebtedness, being in part of said sales, of $898,-772 31, it is now proposed to deduct for bad debts $359,908 80, being at the rate of 40 per cent. The testimony not only does not warrant such a deduction, but justifies me fully in saying that five per cent. would be a very liberal allowance for loss on this account. The extravagant estimate under discussion appears to have been based upon the assumption that the value of these debts is to be ascertained by what they would command, if forced upon the market, under the auctioneer's hammer, in a moment of financial revulsion and depression. It can scarcely be necessary to comment upon such an assumption as this. In the judgment of the law, these debts are worth what they will yield after the patient and faithful endeavor to collect them, which experience proves, men ordinarily careful of their interests, will make. Calculating the loss at 5 per cent., we have for this item $44,938 60, instead of $359,908 80.

The account re-stated, with the corrections named, will stand as follows:

Receipts.		
From sales of reaping machines, including 500 machines on hand		$2,833,980 00
From licenses to Wood & Ball		16,000 00
Receipts from patents of 1845 and 1847, before the expiration of the patent of 1834		15,000 00
Receipts from Seymour & Morgan in 1848		4,000 00
		$2,868,980 00
Expenses.		
Expenses of traveling, experimenting, &c, chargeable to the two patents of 1845 and 1847	$36,000 00	
Cost of making machines	1,134,277 74	
Commissions on sales	283,398 00	
Loss on debts	44,938 60	
Interest on capital	40,950 00	
Depreciation of machinery,	31,500 00	
		1,571,064 34
Credit to patents of 1845 and 1847		$1,297,915 66

That this is rather below than above the amount of profits actually realized from the two patents, may be fairly inferred from the testimony. In 1845 the applicant, as proved by his brother, was worth nothing; or to use his own phrase, "was not worth a red cent." One of his agents, who appears to be thoroughly acquainted with his business and estates, states that he is now worth about a million and a half of dollars. No attempt has been made to controvert either of these statements; nor is there any allegation that since 1845 the applicant has been engaged in any other enterprise or pursuit, or has had any other resources than the sale and use of his inventions as patented in 1845 and 1847. This colossal fortune is, then, clearly and wholly their fruit. In the total absence of any testimony tending to show the relative expenses and profits of the inventions of 1845 and 1847, I am constrained to accept the estimate of the applicant, which assigns an equal share of the profits to each. This will give to the patent of 1845 a profit of $648,957 08, to which must be added $9,354 05, being proceeds of the judgment against Seymour & Morgan—thus presenting an aggregate of $658,311 13.

Is this a reasonable remuneration?

[CONCLUDED NEXT WEEK.]

Correspondents

*** PERSONS who write to us, expecting replies through this column, and those who may desire to make contributions to it of brief interesting facts, must always observe the strict rule, viz., to furnish their names, otherwise we cannot place confidence in their communications.

NUMBERS 4, 14, 17, and 19, this volume of the SCIENTIFIC AMERICAN, cannot be supplied, as we are entirely out of them.

M. W. O., of Iowa —Citizen patentees are not compelled to have their articles in market within a specified time. Foreign patentees, however, must put their articles on sale within eighteen months from the date of patent. You could trust your invention with any honorable person.

J. D., of La.—Enameled oilcloth which greatly resembles morocco leather, is made of twilled cotton covered with several coats of oil-varnish. The first coat is generally composed of boiled linseed oil oxydized with some sulphuric acid and sulphate of zinc, and is rendered jet with lamp-black. All the subsequent coats are similar, only the first is the thickest. After each coat the cloth is dried in an oven, and it is polished with pumice stone before it receives its last varnish. The leather appearance is given to it by pressure between rollers. Such cloth is now used very extensively for upholstering articles, such as cushion covers, &c. It is nearly as durable as leather, and is far superior to it for traveling bags, as it is not affected by rain.

E. A. B., of N. H.—Any kind of varnish colored with dragon's blood will answer for violins. Add a little red sanders, and it will become richer in the tint.

A. Y. McD., of Mo.—The steam domes of all the boilers in a gang should be connected together by pipes, and so should the feed water pipes. You have been anticipated in similar views to those contained in your letter by one published on page 186 of the present volume of the SCI. AM.

G. Z., of Pa.—What use do you make of boxes with spiral grooves, as represented in your sketch? There can be no good draft in a chimney unless it is hot. If the top of a chimney were colder than the surrounding atmosphere, it would cause a downward instead of an upward draft.

L. P., of Mass.—We are out of the numbers you send for. You had better advertise your patent felt roofing in our paper, then you will reach the enquiry referred to.

L. B., of Wis.—Quicksilver is made into an amalgam with tin for putting on the backs of looking-glasses There is but little difference between the durability of all the kinds of tin roofs, if they are put on well in the first place. We prefer the soldered, but others prefer the lapped roof.

R. W. Sanders, of Tuscaloosa, Ala., wishes to engage a person who understands the brewing of lager bier.

F. L L., of N. Y.—We did not secure the patent to which you refer.

W. W., of Ohio.—You need have no serious apprehension about McCormick's extension case. He cannot prevail on Congress to grant it. We shall oppose it, of course, as we do all such cases. We have not a single copy of the number you want.

E. R., of C. W.—You can purchase the work you mention from Wiley & Halsted, of this city. We think Smee's battery is the best for silver-plating.

C. M., of Conn.—Common pitch applied hot is an excellent cement for an aquarium. White lead and ground glass make a good cement.

W. E., of Ohio.—We do not believe that it makes a particle of difference in the health of a person whether he sleeps with his head east, west, north or south. A child will neither be injured mentally or physically by sleeping with a "healthy" old person.

S. S. B., of Ala.—A patent on a stitch is for a particular way of interweaving threads, and is not for a general "result." We have not stated that the claim to the stitch you allude to was "undoubted." Any person using a patented stitch would infringe; but the machine by which it was made would not necessarily be an infringement. As to whether the assignee, assignor, or manufacturer would have to buy the right to use the previous patent, depends upon their mutual agreement. In the absence of any agreement, the manufacturer only would be accountable to the holder of the prior patent.

G. H. & H. S., of Iowa—We should rejoice as heartily as yourselves, depend upon it, if your wish "that the SCIENTIFIC AMERICAN might have 200,000 subscribers" could be realized. We are ready and anxious to receive them. You can have the money you speak of paid over to us, if you wish so to do.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, February 12:—

A. O., of N. Y., $5; D. F., of Pa., $35; J. D. M., of Ohio, $55; W. L. W., of N. Y., $60; C. D. W., of Ohio, $25; J. S., of N. J., $15; R. T. W., of N. Y., $30; W. F. M., of N. Y., $25; A. W., of N. Y., $30; S. D., of Mich., $32; R. B., of Conn., $30; R. S. L, of Conn., $30; M. G., of Conn., $25; F. & C., of Mass., $30; C. Van T., of N. Y., $100; J. C., of N. J., $30; T. L. W., of La., $300; J. F., of La., $25; J. L, of La., $30; A. B. & G., of Pa., $250; J. G., of Ky., $20; J. R., of Pa., $35; M. C., of N. Y., $25; S. W. & R. M. D., of Mass., $15; E. S., of Vt., $25; S. & C., of R. I., $30; H. H. & W., of N. Y., $30; D. L., of Mo., $30; R. S. L., of Conn., $30; M. B., of N. Y., $30; W. G. R., of Mass., $55; J. C. S., of Mass., $5; T. H. W., of ——, $30; T. W. C., of N. J., $15; E. P. T., of N. J., $30; K. & B., of L. I., $10; H. W. F., of N. J., $30; L. S. W., of Conn., $30; C. & D., of Ill., $25; J. S. W., of Iowa, $30; E. W., of R. I., $30; A. & H., of N. Y., $30; A. S. S., of Mass., $30; W. S., of Mo., $30; G. W. L., of Ind., $25; D. B., of N. Y., $30; W. W. S.,

of Ohio, $100; L. & G., of Ohio, $30, J. P., of Cal., $30; M. H., of Conn., $55; W. Z. C., of Ill., $55; T. J. De Y., of Pa., $25; A. L., of N. Y., $100; W. & F., of N. Y., $20; C. M., of N. J., $40; E. G. & Sons, of Mass., $55; E. H., Jr., of N. Y., $55; J. G. W., of N. Y., $55; G. B., of N. Y., $25; C. D. B., of N. Y., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, February 12:—

J. L. R., of N. Y.; M. G., of Conn., R. S. L., of Conn.; W. S. K., of Conn.; C. D. W., of Ohio; A. C., of N. Y.; O. H. M., of Iowa; W. F. M., of N. Y.; E. S., of Vt.; M. C., of N. Y.; J. R., of Pa.; H. F., of La.; J. G., of Ky.; J. S., of N. Y.; C. & D., of Ill.; G. S., of N. Y.; C. M., of N. J.; E. L. R., of N. Y.; W. W. S., of N. Y.; W. & R., of Vt.; C. M., of Wis.; G. W. L., of Ind.; T. J. De Y., of Pa.; H. W. H., of Conn.; W. & F., of N. Y.; G. S., of N. Y.; E. G., Jr., of Mass.; E. H., Jr., of N. Y; J. G. W., of N. Y.; C. D. B., of N. Y.; G. B., of N. J.; J. G. W., of N. Y.

Literary Notices.

CURIOSITIES OF NATURAL HISTORY. By F. T. Buckland, M. A. New York: Rudd & Carleton, 310 Broadway.—This is truly a pleasant book, redolent of the life of woods and fields and running brooks, and while it teaches, it amuses. Stories of animals and fish are told that are quite new, and reptiles have a place. The author is an army surgeon, and the son of the late Dr. Buckland, the geologist, so he has an inborn taste and a large opportunity for observation, which he has made good use of. The book is so truly charming, that we took it up just to look into it, and have concluded by reading every page with more interest than any work of fiction we ever perused. Would that we had more like it, for it is the most pleasant science we ever studied.

BLIND BARTIMEUS: Or, The Story of the Sightless Sinner and his Great Physician. By Rev. William J. Hoge, Professor, Union Theological Seminary, Virginia. New York: Sheldon, Blakeman & Co., publishers, Nassau street.—This is an eloquent and instructive religious volume, and well calculated to encourage and comfort all who are disposed to seek for it above the merely sensual.