Improved Sawing Machine.

This machine is principally intended to to cut down standing timber, but is so designed that it may be used subsequently to cut the wood up into lengths for any purpose, but more especially for firewood. Full views are given in the accompanying engravings of it in both positions as it appears at work. In order to facilitate its transportation to various localities, or from one point to another when in use, the machine is set upon wheels.

In detail it consists of a frame, A, carrying a crank shaft, B, on the front end. The shaft, being driven by the crank wheel, C, imparts motion to the saw through the agency of a lever, D, jointed to a curved support, E, the saw being attached to the lever below the frame. Guides, F, are provided which serve to keep it straight and prevent buckling when at work. Where the machine is used to cut down trees the saw is above the frame and works horizontally, as shown, instead of vertically. A bolster, G, is also provided as a guide, in which there is a mortise through which the saw passes, and a gib, H, is fitted to this mortise against which the back of the saw works. This gib has a long surface and presses the saw, or feeds it up to the tree, through the agency of a weight, I.

The hind end of the frame, where it bears on the axle, at J, is rounded off so that the machine may accommodate itself to inequalities of surface. By these several parts and the arrangement of them the inventor claims to have invented a useful machine which can be applied to the purpose set forth. The reader will understand that there is but one machine which is capable of being used on different kinds of work.

For further information address Jas. R. Logan, Bellmore, Ind., by whom a patent was obtained Dec. 19, 1865, through Scientific American Patent Agency.

Fig. 1.

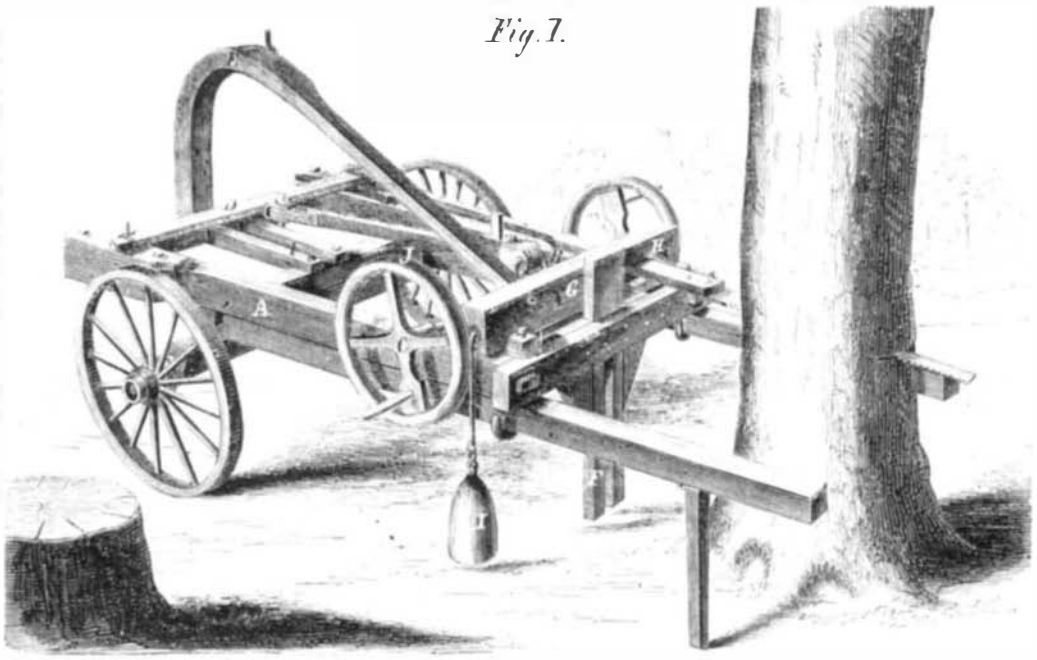
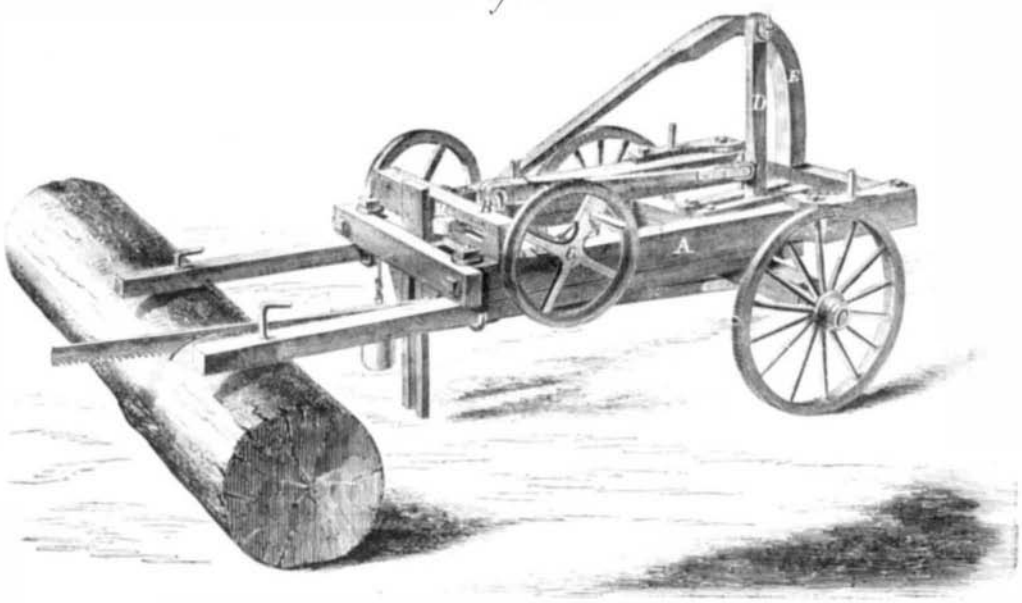


Fig. 2



LOGAN'S SAWING MACHINE.

Ready Mode of Amalgamating Zinc Plates.

Mr. B. Gibsone writes to the editor of the *Chemical News* and says:—"I venture to send you a method of almost instantaneously amalgamating corroded zinc battery plates, which occurred to me recently, after some twenty years' trial of different plans; perhaps economy of time in even humble matters of detail may be worth record where the process is of repeated occurrence.

"The following treatment in the case of thickly oxidized plates will yield in speed and effectiveness to few:—Place in a flat dish two ounces of common hydrochloric acid, one drachm of a saturated solution of bichloride of mercury (corrosive sublimate), and half an ounce of the latter metal; lay the zinc without previous scouring, in the liquid mixture, and gently smear the mercury over the surface of the plate with a tooth brush; the mercury will readily and thoroughly adhere to each portion of the surface as the oxide is rapidly dissolved by the HCl.

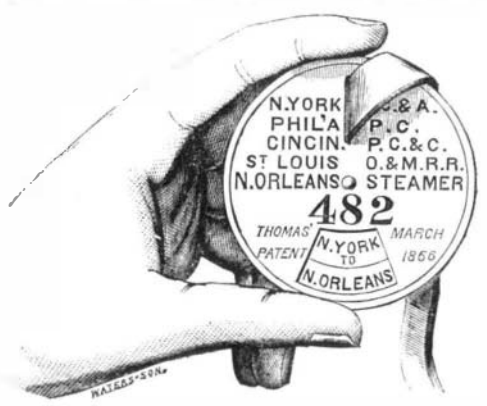
"As a means of comparing speed, in seventy seconds, I completely coated inside and out a cylindrical plate of forty square inch surface, whose interior was rather inaccessible and very corroded.

"A set of six cylindrical cells of Groves' battery were thus, with the same materials, amalgamated, equipped, and primed for action in a quarter of an hour.

"No friction is needed; the plates should be well drained from excess of mercury, lest they become brittle, though this danger is lessened by the rapidity of the process."

THOMAS'S RAILWAY CHECK.

A novel check for use on railway trains has been lately invented, and we here give a representation of



it. It consists of two brass disks, one inside the other, held in the proper position by the strap. The outer one may have the names of any roads engraved thereon, while the inner one contains the principal cities and towns along the route. This check is set, at the beginning of the journey, at the place the traveler starts from and the one he is going to, so the baggage master, or others in authority, can see, at any station, exactly where the trunk has come from and how far it has to go, a little opening in the outer disk enabling the direction to be read, as may be seen in the engraving, where the check reads from New York to New Orleans.

A very important consideration in reference to the through route check is, that one check will take the place of twenty-five checks, and can be constantly used on the different routes of travel, and also serves as an advertisement in keeping the name of the route which the traveler is passing over continually before him. Immediately upon the arrival of the baggage with the check attached to it at any station, the baggage agent can, in one moment of time, remove the check from the baggage just arrived, and return it with other baggage to any of the several points named on the check.

This is also a local check which serves to answer the purpose of some two or three hundred checks. It represents one hundred stations by its peculiar construction, so arranged as to be kept constantly traveling to and fro from one end of the line to the other. As we have stated, they require but one minute's time for a person of the most ordinary capacity and intelligence to become acquainted with the manner of changing their destinations. They are in no way, manner, or form, complicated. No springs or anything connected with them which render them liable to get out of order; and their cost, comparatively speaking, is from two to three hundred per cent. less than the checks at this time in use, thereby the means of saving hundreds and thousands of dollars to railroad companies. For further information address G. F. Thomas, Nos. 443 and 445 Broadway, New York City.

Simple Process for Silvering.

An employee of the Bavarian Mint has published an improved process for silvering copper, brass, and other alloys by means of a solution of silver in cyanide of potassium; the difference from the usual method consists in the use of zinc-filings, with which the objects are coated; when the silvering solution is applied, an immediate deposition of a much more durable character taking place. The filings are easily removed by rinsing in water, and may be used repeatedly for the same purpose. Metallic iron may be coated with copper in the same manner, by substituting for the silver, a solution of copper in cyanide; and over this copper deposit a coating of silver may be applied.

It is suggested in the London *Chemist and Druggist* that chloroform is an excellent medium for the removal of stains of paint from clothes, etc. It is found that portions of dry white paint, which resisted the action of ether, benzole, and bisulphide of carbon, are at once dissolved by chloroform.

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VOL. XIV., No. 16.. [NEW SERIES.]. *Twenty-first Year.*

NEW YORK, SATURDAY, APRIL 14, 1866.

Contents:

(Illustrations are indicated by an asterisk.

POWER REQUIRED TO DRIVE MACHINERY.

"How many pounds of steam does it take to turn your engine over without the machinery at work?" said one engineer to another recently.

"Well I don't know," he replied; "about ten, I suppose."

"I will wager," said the other, "you cannot pass the center with less than thirty."

He looked incredulous.

"To-morrow morning I will try it," and he did so.

He opened the throttle when the gage showed fifteen pounds and the crank was on the dead half center, but the wheels never stirred. He waited a little until the cylinder got hot; he blew the condensed water out and tried it again at twenty, but the crank never moved. At twenty-five pounds it made half a stroke but stopped on the center, and at thirty it barely turned over.

"I wouldn't have believed it," he said to himself.

This was a high pressure engine, 11 1-2-inch cylinder and 32 inch stroke, working at a boiler pressure of fifty-five and sixty pounds to the square inch. Nearly two-thirds of the pressure was absorbed in the friction of the belts, shafting, and machinery. This is not an isolated case. It is quite common, and few engineers are aware of the great loss daily incurred by simple neglect.

It is not difficult to account for it when we reflect that in many shops it is accounted of no importance if shafting is out of line, or belts laced up so tight that bearings heat; that it is of no moment whether the separate machines are in good order or not, and that one kind of oil is thought as good as another. To us it seems strange that men should be willing to pay tithes to carelessness—to waste means on nothing when money is so hard to get. It is certainly a small thing to line up shafting and to look after the other details. In the matter of oil, it is a well settled fact that the purest is the best, and that the use of cheap lubricants (so called) is a mistake. Shafting that is in line will work without any binders on the bearings, for the belts serve the same purpose, and no cap is needed except a slight cover to keep dust out.

By actual test with a dynamometer Bourne gives the following work done by an engine of 23 1-2 horse-power: Two pair of stones, 4 feet 8 inches diameter, grinding wheat; two of the same size grinding oatmeal; one dressing machine; one fanner; one dust screen, and one sifter. One set runs 85 revolutions per minute, the other 90. The oatmeal stones run 120 and 140 revolutions per minute.

He also instances a cotton mill of 2,562 spindles, each making 2,200 revolutions per minute. The bobbins were $1\frac{7}{8}$ long, the thread portion being $2\frac{3}{16}$ long; there were also five turning lathes, three polishing lathes, two bobbin machines, two saws, one 22 inch, the other 14, and 24 bobbin heads. When all the machines were off except the spindles, the actual power required was that of 21 horses, so that each horse-power drives nearly 123 spindles. A small engine of 10-inch bore and 4-feet stroke, making 35 revolutions, with steam at 90 pounds, drove two muley saws of 34-inch stroke, cutting 30 feet of yellow pine per minute, 18 inches thick.

The friction of a steam engine in good order is variously estimated at from five to eight pounds to the square inch. Of course the proper way to find out the actual figures is to take a diagram with the engine and shafting in motion, and another with the engine alone—the difference of the two showing the effective pressure. Very few persons are willing to take the trouble to do this, but go on grumbling at the high price of coal and of the waste of fuel, when they alone are to blame.

It we are to have any radical change in the waste of power in manufacture, we must begin at the details. We have spoken of this so much that we fear our readers are almost as tired of it as we are, but when we reflect upon the immense losses through simple and sheer neglect, we cannot keep silent.

PETROLEUM AS FUEL FOR STEAM ENGINES TO BE TESTED.

Among the amendments to the Naval Appropriation bill which have been agreed to by both Houses of Congress, is one appropriating $5,000 to test the value of petroleum as a fuel under marine boilers. It is to be hoped that this slice of the people's money will be entrusted to the hands of men who will expend it for the people's benefit—who will conduct their experiments in a fair and open manner, allowing all their steps to be made public as the experiments proceed.

There has been very general complaint among the engineers of the country, and manufacturers who are using steam power, that the costly experiments which are being made at the Novelty Iron Works, to test the economy of expansion, are withheld from the public. It is hinted that the conductors of these experiments, in forbidding the press access to the trial, intend to keep the public, who pay the expense of these costly private exhibitions, in blissful ignorance of the result until they can come out with a ponderous gilt-edged volume of reports, at another heavy expense, for their own glorification.

ZINC PLATES FOR PRESERVING BOILERS FROM CORROSION.

The statement seems incredible, that for forty-two years science has been in possession of cheap and simple means for completely protecting steam boilers from rust, and yet these means have never been made use of in the arts. The great Collins steamer *Baltic* is now lying in the East river, and on the wharf by her side is an enormous pile of iron rust, that formerly made up the tubes and tube sheets of her boilers. These boilers cost many thousands of dollars, and their condition is similar to that of hundreds of other boilers in this and other countries. Can it be that a few plates of zinc soldered to these boilers would have preserved them entirely from this decay? There is every reason, short of extensive practical trial, to suppose that they would.

In the year 1824, Sir Humphrey Davy announced his discovery that if a metal which is corroded in salt water is placed in contact with a second metal that is more easily corroded, the action is confined to the second metal, and the first is perfectly preserved. This principle is not limited to the action of salt water, but holds in regard to all corrosive fluids; the most easily corroded metal is called the positive, and the protected one the negative.

Sir Humphrey Davy proposed to protect the copper sheathing of ships from corrosion by attaching to it pieces of zinc, but the plan did not prove a practical success. It has been generally understood that the cause of the failure was the perfection with which the copper was preserved—it was said that the copper was kept so bright that barnacles adhered to it, a slight coating of the poisonous oxide of copper being supposed necessary to drive these shell fish away. M. Becquerel says that this impression of Davy's was erroneous, that neither barnacles nor seaweed adhere to bright copper, but that the real cause of the failure of Davy's process was the erroneous theory adopted by its author. Davy supposed that the mere contact of the two metals was sufficient, while the fact is, the protection is due to the chemical action going on between the more easily corroded metal and the liquid. A coating of oxide or other salt soon forms on the surface of this metal, and stops the action, when the protection ceases. To continue the protection, therefore, it is necessary that this coating should be constantly, or frequently, removed.

There is a limit to the area of iron surface which a piece of zinc will protect, though it is very large. A few small pieces of zinc would probably protect the largest boiler; they should be soldered to the iron, and should be so situated that their surfaces could be frequently scoured or scraped.

A BRILLIANT SERIES OF EXPERIMENTS.

Arrangements have been made for a course of three lectures at the Academy of Music, in Brooklyn, by R. Ogden Doremus, M. D., Professor of Chemistry and Toxicology in the Bellevue Hospital Medical College, and Professor of Chemistry and Physics in the Free Academy, on "Views of Life through the Medium of Natural Science." It is stated that "efforts will be made to demonstrate the recent discoveries in science, especially in the departments of heat, light, electricity, magnetism, eleotro-magnetism, thermo-electricity, etc., on a scale commensurate with the size of the edifice in which they will be exhibited."

As Professor Doremus is distinguished for the magnificent scale on which he conducts his experiments, and as these are to surpass all his former efforts, the opportunity to witness them must be a rare treat. Among them will be exhibited the cascade of light, of which we spoke in a recent issue.

THE ENGLISH IRON CLADS.

One of the latest English iron-clads, the *Bellerophon*, is only half clad. That is, for a portion of 160 feet on each side, she is entirely without protection. The central armor is only 100 feet in length, but an iron-plated bulk head $5\frac{1}{2}$ inches thick incloses and protects the battery. All the forward part of the ship is vulnerable to shells, and may therefore be blown to splinters. Possibly the battery and the iron bulk head $5\frac{1}{2}$ inches thick, the engines and boiler possess sufficient buoyancy to keep the frigate afloat after one-half of her has been destroyed. It is said that broadside vessels cannot be completely protected and retain their speed; in other words, that fine models cannot carry the weight of armor necessary to render them invulnerable, but one of our ship builders has shown in the *Re D, Italia*, that a vessel of 285 feet in length, and 50 feet beam, $4\frac{3}{4}$ inches of armor all round, can cross the Atlantic fully equipped at the average speed of 11 knots, without in the least straining herself or even opening the seams in her armor.

NEW PUBLICATIONS.

AMERICAN JOURNAL OF MINING.—This is a neat well-printed journal, lately started, and devoted, as its title indicates to mining and kindred matters. It is illustrated and contains full reports of the condition and prospects of the mines in Colorado, California, and other territories. It is published by Western & Co., 37 Park Row, at $4 a year.

THE MOTHER'S ASSISTANT AND THE HOME MONTHLY—These are two different publications issued from the same house, and are calculated to elevate the taste and morals of families. Select tales of an unexceptional character, together with music of a devotional nature, are given in each number. Besides there are poetry and pictures, so that all tastes are likely to be suited. C. H. Pearson & Co., Boston Mass., and American News Co., New York.

STEEL MARKING STAMPS.—Our readers frequently inquire for the above tools, especially patentees who wish to stamp the date of patent upon their inventions, upon brass or iron. Makers of dies would do well to keep a short standing advertisement in the SCIENTIFIC AMERICAN.