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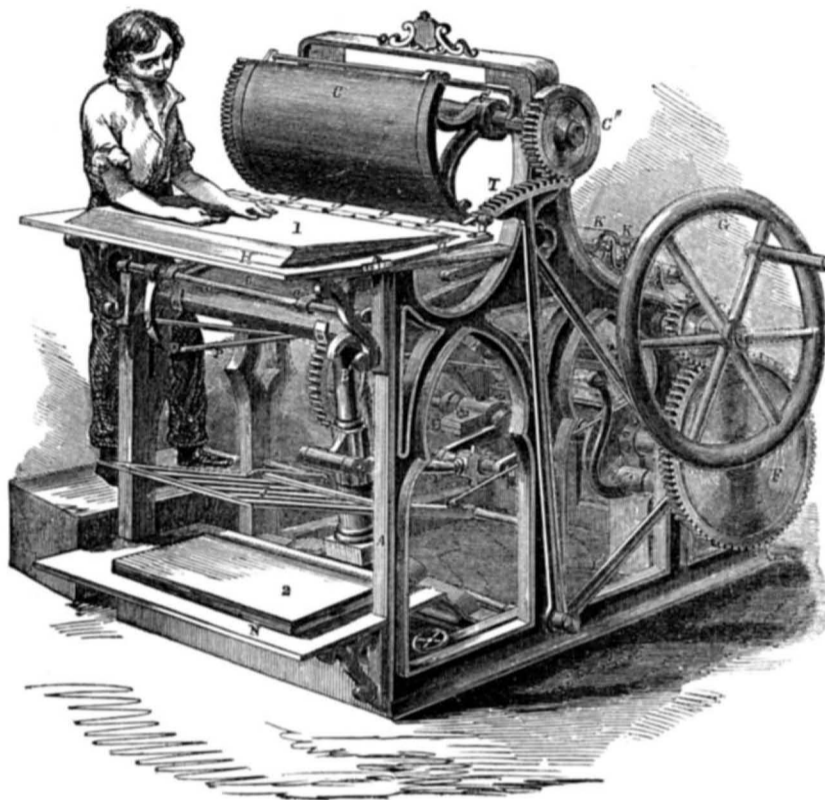
**Improved Printing Press.**

The first printing presses held the type on a plane horizontal bed, and forced the paper thereupon by the pressure of a flat platen descending vertically like the follower in a cider press. In fact, we think cider presses have been used for printing purposes under some extraordinary circumstances, and such or any of the forms of screw press probably constitutes the slowest practical printing press in existence. The fastest style of press yet constructed, or which can probably ever be imagined, requires that the type be mounted on the surface of a cylinder, so that in short the paper is drawn through between two rapidly revolving rollers, like the iron in a rolling mill. One of the rollers or cylinders carries the type, the other is simply covered with sufficiently soft blankets to enable the type to make a proper impression.

There are several styles of press which involve this principle to some degree, without necessitating the mounting of the type in a cylindrical form. In other words, the blanketed roller is employed for rolling against a plane or flat form of type. The press now to be described is one of that class, and is already in quite extensive use, having been before the public for three or four years. Some improvements have lately been introduced, however, which add still more to its value. It prints with great rapidity and perfection, and is considerably cheaper than other presses of equal capacity in these respects. The form is placed on a bed which, instead of reciprocating or sliding backward and forward horizontally, oscillates or rocks to and fro, while a suitable device above, equivalent in effect to the blanketed roller above mentioned, presses the paper into contact, and prints a sheet at each oscillation.

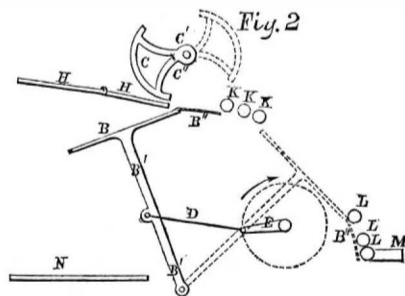
The inventors are Merwin Davis, of New York City, and Charles Potter, Jr., of Westerly, R. I. Figure 1 is a perspective view of the whole, and figure 2 an outline diagram which serves simply to explain the arrangement and motions of the principal parts. A is the frame of the machine, and B the oscillating bed on which the type form is placed; B' indicates the stout standard on which B is supported and enabled to rock on a suitable stout shaft below; B'' is a distributing table suitably curved, and attached to the end of B; C is the blanketed cylinder or portion of the cylinder which produces the impression; C' is the center of motion or rocking shaft, on which this semi-roller is mounted; C'' is a segment fixed on the end of the shaft, C'. The bed, B, rocks on the standard, B, and changes into the position shown by the dotted lines in figure 2. As it effects this movement the semi-roller turns and changes to its dotted position. D is the stout connecting rod by which the motion described is communicated to B from the crank, E; F is a gear wheel on the driving shaft, and G a balance wheel and crank, to facilitate the working of the press by hand power; H is a fixed table or feed board, on which the paper to be printed is placed, and

**DAVIS AND POTTER'S OSCILLATING PRESS.**



H' is a lifting board hinged to H as represented, and which is, by suitable devices, lifted into contact with C at the proper moment for commencing to feed in a sheet. I is a segment fixed on a lever, J, and worked by a cam on the driving shaft, E, to give the proper motion to C. J is a "fly," by which the paper is removed from the tapes and laid on the receiving bank or fly-board, N.

K K K are inking rollers which are mounted in slots or deep notches in the frame, and urged down by springs, so that they are free to rise and fall to a considerable extent, as the bed moves past under them. L are distributing rollers, by which the ink from the



the "doctor," M, is properly spread on the distributing table, B'. Both the perspective view, figure 1, and the strong lines in figure 2, represent the press in the position about commencing to receive a sheet. The light rock-shaft, O, mounted under the paper table, H, is worked by a rod extending from the cam on the driving shaft to the hanging arm, O', and the rocking of this shaft by means of the horizontal arm or arms, O'', lifts the platform, H', into contact at the proper moment.

**Operation.**—The platform, H', rises into contact with C, and suitable grippers on the latter seize the edge of a sheet thus presented. The bed, B, commences to rock forward, and at the same moment, by the aid of the lever, I', and the segment, C'', the semi-roller, C, commences to revolve. The type on the bed B, and the blankets on the semi-roller, C, are thus brought into contact, and as the surfaces roll together the sheet is rapidly printed and raised off the form, the grippers still holding its forward edge in contact with C. The distributing table, B'', during this movement, passes under and lifts the rollers, K, which

subsequently by the onward motion of B, are in effect traversed across the whole face of the form. When the parts have arrived in the position shown by the dotted lines, the distributing table receives an additional coating of ink from the rollers, L, and in returning the form again travels under the rollers, K, which rollers receive in turn a fresh coating of ink from the properly-charged inking table.

To insure the perfect coincidence of the motions of the surfaces on the bed, B, and the periphery of C, there is nicely cut gearing, not represented, on the edges of the semi-roller, C, and corresponding racks on the edges of the bed, B, which lock together just before the operation of printing commences, and continue their union until the sheet has entirely passed. We should observe that while the bed, B, remains in the position shown by the dotted lines, entirely clear of C, and its attachments, the latter is, by the action of the lever, I', rotated rapidly back to its original position, discharging, in so doing, the printed sheet down upon the fly, J, which lays it on N, so that although the motions of B and C coincide perfectly in one direction, the reverse movement of C is completed before that of B has fairly commenced.

It is evident that the front and rear edges of the bed, B, are further from the axis of motion than the middle, and that consequently the roller or semi-roller, C', if perfectly cylindrical, and mounted in fixed bearings, could not be made to act on the form as we have described. To overcome this difficulty the surface of the semi-roller, C, although a portion of a perfect cylinder, is not described from the centre of motion, C', but from a center indicated by a star. The effect of this form, when all the parts are properly proportioned, is to secure a perfectly even contact of the printing surfaces. The bed, B, is furthermore made capable of adjustment by screws at each corner, so that the strength of the impression on all parts of the form may be regulated with the most perfect delicacy. This is an important point in practice.

The first patent on this press is dated July 24, 1855, and the second for additional improvements dated June 2, 1857. The press is constructed with great skill and care in several sizes, and under the immediate super-

vision of the inventor. The form or bed, B, is easily accessible for correction and the like when in the position shown by the dotted lines.

We consider it the most desirable press for general jobbing purposes with which we are acquainted. It registers very perfectly, no tapes or strings are required either in carrying the sheets or throwing them out, and the impression is under perfect control.

Orders for the presses, or inquiries relating thereto, may be addressed to Chas. Potter, Jr., Westerly, R. I., or at No. 9 Spruce street, New York.

**The Raising of Vessels at Sevastopol.**

Up to a quite recent date the accounts received through foreign sources of the success of our countryman, Gowan, in raising the vessels of war sunk at Sevastopol are not as favorable as we had hoped. The line-of-battle ships, frigates, and other vessels which were sunk to form three lines at the entrance of the port, it has been found impossible to move. They are deeply imbedded in the sand above the bilge, and are heavily laden with stones and other articles, which were conveyed on board in order to fix them in their places. Seven small steamers which were anchored near the shore in rather shallow water, and were grounded rather than sunk, were the only vessels which had been taken up and repaired at Nicolaieff.

This is the substance of one account. Another, derived from a letter from one of the members of the expedition from Boston, says that the bark *Susan Jane* arrived there in forty-five days from Philadelphia, the quickest passage on record; but they cannot commence on the heavy work—raising the hulls, for some time yet, and are now engaged in taking out guns, and clearing the ships of their chains and anchors, preparatory to lifting them. The letter estimates that the work will be finished certainly in two years.

The importance of removing the ships on account of their obstruction to navigation is less than it would be if the place still retained its former importance. The point to which we believe the Russian government now directs its greatest efforts is Theodosia, or Kaffa, which is to be one of the heads of the line of railway, and is likely to become a great commercial port.

**Base Line Measurement.**

We briefly noticed last week the recent measurement of a base line in Maine for the coast survey. Professor Bache gave at the Montreal meeting of the Scientific Association an interesting paper on the subject. The line was about five and a half miles in length, and was graded like a common road, at an expense of \$4500, in a rapid manner. The operations of measurement required extreme care, and the most uninterrupted attention. Their most successful measurements were at the rate of over a mile a day; and were so accurate that a re-measurement detected no error—that is, the two measures absolutely coincided. We mentioned last week that an error of a fraction of an inch was considered important in such measurements, but do not recollect any previous instance where two measurements of such length as this proved to agree exactly.

**Flax Seed and Oil.**

There are fifteen mills for grinding and pressing linseed within a range of sixty miles of Dayton, Ohio, and the proprietors met in that city recently to fix the price of the seed. There is a very abundant crop this season, and the price agreed on was from \$1.00 to \$1.20 per bushel according to the locality. Linseed cakes, the material after the oil has been expressed, are much valued in Great Britain as feed for cattle.





**The Laboratory—Chemical Analysis.**

To those unacquainted with chemical science few things appear more extraordinary than the analytical art. In the laboratory, two kinds of analysis are recognized, termed proximate analysis and ultimate analysis. Proximate analysis is comparatively easy; hence the results obtained by it are generally paraded in the public prints. Ultimate analysis is, however, more recondite, and requires a good knowledge of mathematics; but it leads to the most wonderful discoveries. Proximate analysis divides the substances under examination into their natural parts. Thus, suppose beer is to be analysed—we consider proximate analysis perfect if we can separate the water, the spirit, the salt, the saccharize or sugar that it contains, specifying the quantity of each. Again, when we are to determine the composition of a mineral given to us, if, by a proximate analysis we find it soda, clay, iron, lime, and carbonic acid, we conclude that these substances indicate the mineral's composition. Ultimate analysis, however, goes still further; for by it we ascertain the composition of spirit, sugar, lime, water, salt, carbonic acid, &c. If by an ultimate analysis we divide a material into two or three parts, and these parts are no longer capable of division, or rather of being separated into other parts, then we have arrived at its ultimate composition—that is, it is divided into its absolute elements. The names of the elements not being so familiar to the general reader as those of the natural compounds, the ultimate analysis of a substance possesses little interest out of the laboratory. Not so, however, with a proximate analysis, for the interest which the public take in this is shown by the applause which has been given to the chemist who has exhibited starch in mustard, boleammoniac in anchovy sauce, chicory in ground coffee, and other little sophistications.

To be able to execute an ultimate analysis, and thence to deduce by calculation and analogy some fundamental principle relating to the substance so analysed, requires a genius which only now and then sparkles among men, such as Davy, Liebig, Faraday, and Graham. The proximate analyzers are geniuses of the second order in chemical fame; such men are Hassall, Bastick, Muspratt, and Piesse. Before a person can attempt to perform a proximate analysis, he must be thoroughly versed in the nature, qualities and properties of almost every substance that can be laid before him. This, of course, requires great study, years of experience in the laboratory, and a quick adaptation of the mind to see by analogy, from its mechanical form, to what chemical agents to subject the substance under analysis. We, therefore, are unable, in a short article like this, to teach the reader to become an analytical chemist; nevertheless, we can perhaps give him an idea of the process. Suppose a substance to be given for analysis; it is first examined as to the class of creation to which it belongs. Is it mineral, animal, or vegetable? The question being decided that it is mineral, the first process would be to subject it to water. After being well mixed with that fluid, we should notice its loss of weight, if any; next, we would place it in hydrochloric acid, and again notice loss of weight; then (if there be sufficient reason by its metallic appearance) into nitric acid; then into strong ammonia; then it would be fused with an alkali, and again subjected to weak acid. Now we should begin to examine the various fluids by means of these materials which in the laboratory are called "tests." All these tests are used with a previous knowledge of their action; thus, oxalate of ammonia indicates "lime;" nitrate of baryta indicates "sulphuric acid;" sulphuretted hydrogen shows a "metal" (this has to be again examined to learn what metal); pure ammonia tells of "phosphoric acid;" and so each base and acid has to be searched for until the analysis is complete, and the weight of each matter calculated to the proportion of the entire mineral. An ordinary kind of analysis, such as to ascertain the presence of lead in water, or arsenic in flour, is much more simple, there being only one substance sought for; we have therefore only to find an infalli-

ble test for the material to pronounce judgment as to its presence. Analytical chemists are therefore chemical police, who warn the public against adulterations, careless dispensers, and poisoners.

**Utilization of Offal.**

There is, according to the *New York Sun*, a systematic method adopted in Paris and some other European cities for disposing of dead animals profitably by feeding them to rats. There are, it would appear, large *ratteries* conducted by men who do little else than keep on the alert for dead and dying animals. They become such ready judges of the brute creation that they frequently bargain with, and pay beforehand, the owner of an animal likely to die, for his carcass. When obtained, the dead animals are conveyed to a large enclosure swarming with millions of rats. Being left there at night, the next morning nothing but bones remain, picked as clean and white as could be accomplished by any other method. The bones are then ready for any of the thousand means of turning them to useful purposes.

When the rats increase beyond all necessary requirements, as they naturally do, an ingenious method is adopted of lessening their numbers. All around the walls of the enclosure, near the ground, are made immense numbers of false holes, which penetrate about eight inches in depth. At night, when the rats are all out, a *charivari* is got up with tin pans, kettles, gongs, and other appliances, which speedily frighten them to their holes. They rush for safety to the walls, the real holes become choked up with numbers, and the rats plunge into the false ones, from whence they are afterwards picked out by their tails and thrown into a basket. Their skins are sold to be made into gloves, their carcasses are consumed by their brethren, and the bones are turned to other useful accounts. This is another of those astounding wonders which so often appear in American journals as emanating abroad.

**Bones.**

There is a bone-boiling establishment opposite Yonkers, on the Hudson river, which pays for bones in this city alone an average of \$100 a day. The fore leg and hoof are usually bought by manufacturers of glue, and when they are done with, they are sold to the bone-dealers at two cents a pound. The hoofs of horned cattle are disposed of at the rate of \$40 a tun, and are afterward made into horn buttons and Prussian blue. Horse hoofs and sheep hoofs and horns are sold for \$15 a tun. On the arrival of the bones at the factory, the thigh and jaw bones are sawed so as to admit of the removal of the marrow. They are then thrown into a vast cauldron and boiled until all the marrow and fatty substances attached to them are thoroughly extracted. The fat is then skimmed off and placed in coolers, and the bones are deposited in heaps for assortment. The thigh bones are placed in one heap for the turners; the jaws and other bones suitable for buttons are placed in a second pile; the bones suitable for "bone black" come No. 3, and the remainder are ground up for phosphates and manures.

"Bone black" for sugar refiners is worth from 2 1-2 to 3 1-2 cents a pound. There are eleven large sugar refineries in this city. Stuarts' alone pays about \$40,000 a year for "bone black."

**Formation of Coal.**

Professor J. W. Dawson, at the late Montreal meeting, read a paper in which he argues that the largest beds of coal in Eastern America consist mainly of the flattened bark of trees, the wood of which has perished, or appears only in the form of fragments and films. He did not insist on this view, although he had specimens which showed the mass of the trees reduced to a very thin sheet, while the bark remained of a large, perhaps nearly of its original size. He suggested that of the curious fossils known as "Sternbergiæ," those which occur only with smooth coatings of coal might have been analogous to rushes in their structure, while those which had fragments of fossil wood attached were of a different character. Prof. D. has compared his

specimens with living plants, and found one—the *Cecropia Peltata*—in which the medullary cylinder is lined throughout with a coating of dense whitish pith tissue, forming a sort of internal bark. Within this the stem is hollow, but crossed with arch-like partitions of a tissue like the coating. Of this character must have been many species of the "Sternbergiæ."

**Lead.**

When this metal was first used by man no one can tell. It is known to have been in common use among the Romans, who sheathed the bottoms of their ships with it. At that time lead was twenty-four times the price it is now. The uses of lead are very numerous, such as for covering buildings, for water pipes, for dyeing and calico printing, in making glass, for glazing porcelain, for refining gold and silver, for pigments. White lead, red lead, and yellow chrome, are known to everybody. The application of lead as a cosmetic is somewhat curious. The Roman ladies went to "paint" with ceruse (oxyd of lead). Plautus, an old poet, introduces a waiting-woman refusing to give her mistress either ceruse or rouge, because, in the true spirit of a flatterer, she thought her quite handsome enough without it. The best hair-dyes are made with lead. The quantity of sheet lead used for wrapping tea, tobacco, and perfumery goods, is enormous. It is remarkable that this metal, when dissolved in an acid, has the property of imparting a saccharine taste to the fluid. Thus the common acetate of lead is always called "sugar of lead." It was, perhaps, on this account that the Greeks and Romans used sheet lead to neutralize the acidity of bad wine—a practice which now is happily not in use, since it has been found that all combinations of lead are decidedly poisonous. Lead will take off the rancidity of oil, and on this account it is much valued by watchmakers for making their lubricating oil. The alloys of lead, which we call pewter, solder, and others, are so essential in everyday life that we should be in a regular "fix" without them. "As heavy as lead" is a proverb which brings to our minds its weighty quality, which is of great importance, for it enables us to ascertain the depths of the ocean; and without we could do this, how could we lay down the telegraph cables? how ascertain the presence of those dangerous banks which upset the vehicles of the mighty deep? Thus we perceive that one material is subservient to another, till that great unity is produced which we call the world.

SEPTIMUS PIESSE.

**The American Camels.**

The camels first imported, are, it is reported, employed with tolerable success in transporting supplies between St. Antonio and Camp Verdo, Texas. Three little ones were born in March, and five or six more births are expected. The principal remaining point is the character of the stock that may be produced. The officers in charge are, however, sanguine that it will fully equal that of the parent stock, and may, by proper attention, be more highly developed.

**Diamond.**

An item is going the rounds to the effect that one of the workmen engaged in boring an artesian well in Stryker, a village on the Air Line Railroad, about ninety miles from Toledo, O., found a pure diamond last week, at a depth of about one hundred feet. The diamond is represented to be of the size of an ordinary marble.

**French Silk Manufacture.**

The production of cocoons in France has diminished from about 58,500,000 pounds in 1853, to about 16,750,000 in 1856. The aggregate production of silk in the world is estimated at a value of nearly \$200,000,000.

A piece of candle may be made to burn all night in a sick room, or elsewhere, when a dull light is wished, by putting finely powdered salt on the candle until it reaches the black part of the wick. In this way a mild and steady light may be kept through the night from a small piece of candle.

**Economization of Earth Work in Cities.**

The digging of a pit at the point where a branch pipe, either for water or gas, is to be connected to a main in the streets of a city, cannot be avoided, but the serious annoyance due to tearing up the sidewalk and area in front of a building, to lay down the small branch leading thereto, may, in some cases, be got over by "tunneling" with a common auger. The *Hartford Times* suggests that augers be made for the especial purpose, and instances a recent case in that city, where an operation was effected with complete success, and at a cost very trifling compared with the old mode, by simply attaching an iron rod fifteen feet long, as an extension to the shank of a common 3-inch screw auger.

**Too Large Estimates.**

The editor of an exchange journal is severe on a class of inventors who exhibit a money grasping spirit altogether too reckless to suit his ideas of propriety. He instances a new patent earth pulverizer which, according to the inventor, can be built for \$150, and for which the asking price is \$600, and promising that as this inventor says no farmer without it can compete with those who use it, very pertinently inquires if it is generous to hold it quite so high? Supposing one million, or about one in five, of the farmers in this country should pay his clean profit of \$400, what would one man do with so much money?

**Patent Extensions for 1856.**

We publish herewith a list of such patents as were extended during the year 1856, for a term of seven years. Extended cases are not published, except in the Annual Reports:—

- Spark Arresters*.—William C. Grimes, Philadelphia, Pa.
- Machines for Threshing and Winnowing Grain*.—Andrew Ralston, West Middletown, Pa.
- Reaping Machines*.—Jonathan Read, Alton, Ill.
- Constructing Presses for Pressing Hay, Cotton, &c*.—S. W. Bullock, New York City.
- Heating Stoves*.—Zephaniah Bosworth, Har-mar, O.
- Water Wheels*.—Lemuel W. and George W. Blake, Pepperell, Mass.
- Constructing Shielded Pins for Securing Shaws, Diapers, &c*.—Thomas Woodward, New York City.
- Machines for Ruling Paper*.—George L. Wright, West Springfield, Mass.
- Constructing Brushes for Dressing Warps*.—Samuel Taylor, Cambridge, Mass.
- Felting for Coats, Hats, &c*.—Marmaduke Osborne, New York City.
- Grinding and Polishing Metallic Surfaces, particularly Saw Plates*.—Richard M. Hoe, New York City.
- Lamps for Essential Oils, &c*.—Michael B. Dyott, Philadelphia, Pa.
- Water Wheels*.—Reuben Rich, Salmon River Post-Office, N. Y.
- Machine for Cutting Shoe Pegs*.—Stephen K. Baldwin, Gilford, N. H.
- Machine for Sweeping and Cleaning Streets*.—Joseph Whitworth, Manchester, England.
- Machine for Cutting the Threads of Wood Screws*.—Cullen Whipple, Providence, R. I.
- Power Printing Press*.—Isaac Adams, Boston, Mass.
- Power Printing Press*.—Isaac Adams, Boston, Mass.
- Constructing Locomotive Engines*.—Matthias W. Baldwin, Philadelphia, Pa.
- Construction of Brick Presses*.—Alfred Hall, Perth Amboy, N. J.
- Window-Blind Hinges and Fastenings*.—William Baker, Utica, N. Y.
- Printing Presses*.—Jephtha A. Wilkinson, Fire Place, N. Y.
- Steering Apparatus for Vessels*.—George W. and E. B. Robinson, Boston, Mass.
- Pump and Fire Engines*.—Benjamin T. Babbitt, Shuler C. Higbee, and Peter W. Plantz, Little Falls, N. Y.
- Door Locks*.—John P. Sherwood, Fort Edward, N. Y.

As we have not sufficient room for the publication of the claims, we will furnish a copy of any one of them for the usual fee of one dollar.

## New Inventions.

## American Marks in Birmingham.

An American ax company has instituted proceedings against thirty-six merchants and manufacturers for using their mark on the axes and other edged tools sold in England. The parties proceeded against do not deny the existence of the practice for the last fourteen years, and plead its notoriety for so long a period as a justification.

## Vibration near Mill Dams.

A paper, by Professor Snell, of Amherst, read at the recent Montreal meeting, was upon the vibration of waterfalls. Acknowledging the reality of vibration produced by friction on the edge of the dam, he proved that it was sometimes produced by the vibration of air behind the fall. It is important, of course, to know the cause of this evil, which sometimes becomes so serious in the neighborhood of mill dams as to keep windows and doors continually rattling. We have known it to be cured in some instances by constructing an inclined platform to deflect the water down the stream as it struck the base of the fall.

## Improved Water Wheel.

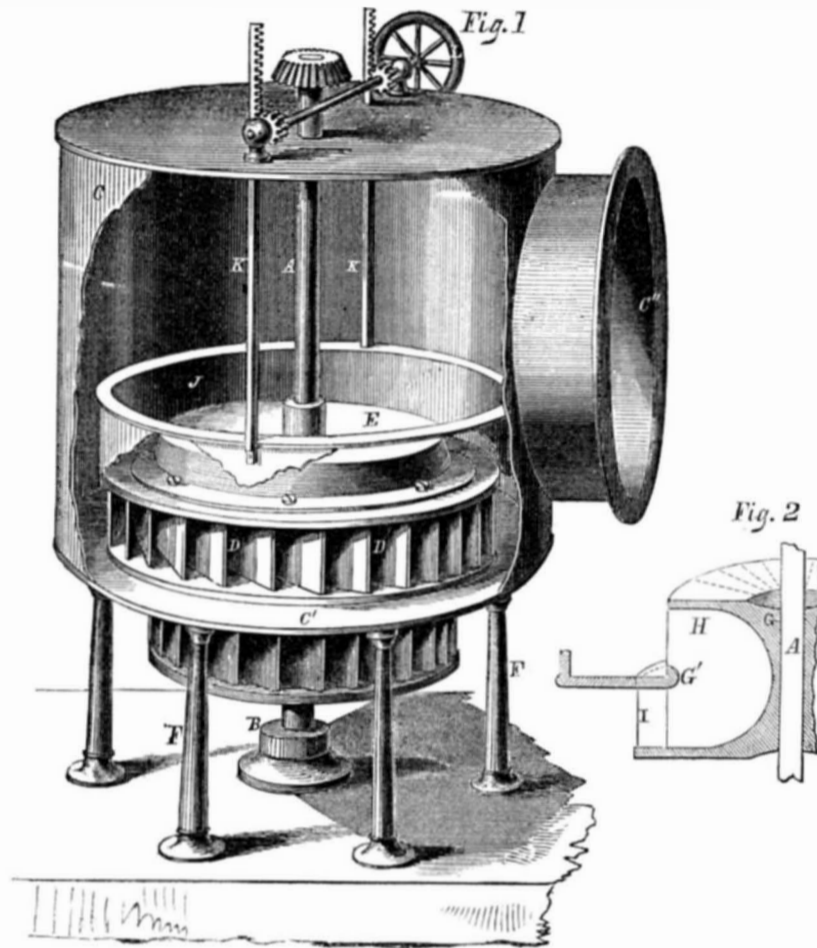
The water wheel represented in the accompanying figures combines to a considerable degree the peculiarities both of the Jonval and the Fourneyron turbines. The water is fed into a case around and over the wheel, and is caused to impinge against the buckets, in a manner analogous to the former, while it is discharged from the periphery of the wheel at a lower level, through buckets which are curved in a manner similar to those of the latter much approved wheel. The effect attained or striven for, in this as in all turbines, is to receive the water at a tolerable velocity, approximating that at which it would escape freely under the given head, and to finally discharge it from the wheel with no considerable motion in any direction.

A is the shaft, and B a suitable step therefor. C is the side, and C' the floor of the penstock. C" is the lateral passage through which the water is admitted. D D are guide plates arranged around the periphery of the upper portion of the wheel, and between which the water is led in its passage to the buckets. E is the cover, a fixed casting which is supported on the guide plates, D D, and which relieves the wheel from any pressure of the water above. F F represent simple supports of the penstock, and may be made of any ordinary material, and in any form most convenient. G is the main body of the wheel, cast in one piece. G' is a ring at the half height of the wheel. It is fixed to and forms a part of the wheel, and revolves with it. H H are radial buckets, and I I are Fourneyron buckets—those which are curved backwards, and through which the water is finally discharged. J is a cast iron ring which fits tightly yet easily to the series of guide plates, D, as also to the cover, E. It is free to be raised or lowered by the rods, K K, the upper extremities of which rods are connected by pinions and a shaft as represented to the hand wheel, L, or to any other suitable device for hoisting and lowering to regulate the speed. When the ring, J, is lowered quite down, its edge makes a tight fit on the upper surface of C', but on being raised it allows the water to flow inward among the guide plates, D, in quantities proportional to the extent to which it is elevated. It is represented in the figure as hoisted to its full extent, and also as partially broken away, the better to show the other parts.

The water is received in the penstock, C' with or without a slight rotary motion therein, depending on the manner in which C' is connected. It is advisable to so connect the passage, C", that the water shall rotate in C in the same direction as the wheel revolves. In this reservoir its surface stands at nearly the same level as in the mill pond from which it is received, and the water presses with its full hydrostatic force on the various parts of the interior. When, by turning the hand wheel, L, the gate J is raised, the water flows through the spaces between D D, and strikes

in a tangential direction on the radial buckets H, and escapes from the edge of the radial buckets, H, only by rushing out through the curved buckets, I, thus aiding still further in urging forward the revolution of the wheel.

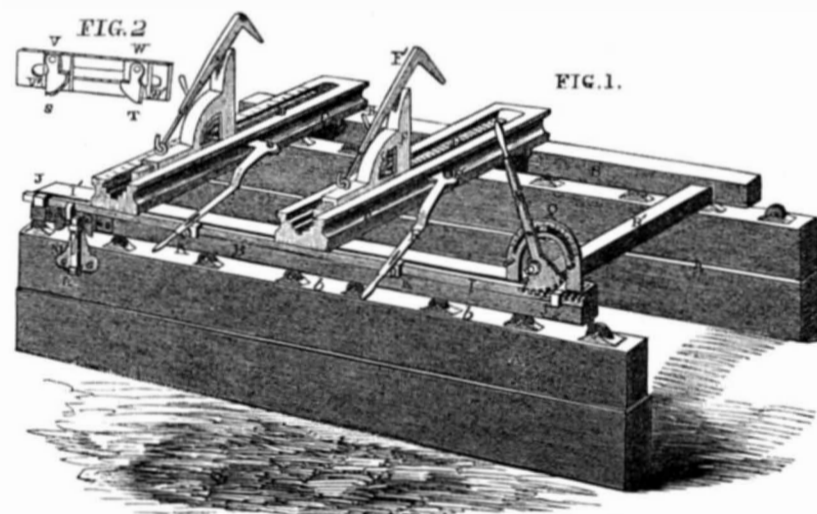
## BALDWIN'S TURBINE WATER WHEEL.



It is thus discharged in lines so nearly tangential to the periphery, and at a relative speed so nearly equal to the actual motion of the latter, that its momentum is very trifling.

This wheel was patented on the 25th of November, 1856. For further information, address the inventor and patentee, Stephen K. Baldwin, Guilford, N. H.

## WELLS' AUTOMATIC SAW MILL BLOCKS.



The ordinary head and tail blocks mounted on the carriages of saw mills are adjustable by hand, and their operation requires two men, or if only one is employed, he must travel at each setting of the log, from one end to the other of the carriage, and adjust each end separately. There are automatic head blocks, however, several of which we have at different times illustrated, in which the operation of setting the log is performed with mathematical precision, without any aid of the attendant. In the invention now to be described, the advantages of quite perfect mechanism are secured without sacrificing the convenience afforded by the ordinary method of adjustment by hand. The latter is especially desirable in sawing tapering joist, or the like. The form of head block here represented is designed for circular saw mills, but the same principle may be applied to those with reciprocating saws.

Fig. 1 is a perspective view of the whole, and fig. 2 a diagram of a small portion which is peculiarly important, and represented but obscurely in Fig. 1. A is the stationary frame or support, B B are the longitudinal timbers, and B' the cross timbers of the ear-

riage, which is by the ordinary means induced to travel backward and forward on ways, or on friction wheels, *b b*. The engraving represents both blocks, which are precisely alike, and represented by C C. D is a rack which is fitted to slide longitudinally in a suitable dove-tail groove on the upper surface of C. It is connected to the bent lever E, which latter is hinged to C at the angle E', so that any angular motion imparted to E moves the rack D backward or forward transversely in the carriage. F is a knee-shaped casting also supported in the groove in the top of G. It is free to slide backward and forward in C, except for the action of three or more pawls, G, which are so mounted as to take in the teeth of the rack, D. F' is a dog which aids in holding the log firmly in contact with F, and H is a lever by which the pawls, G, may be all lifted out of contact with D at pleasure. The lever, E, may be grasped by the handle represented at the nearest extremity, and it follows that any movement given to this lever imparts a longitudinal reciprocating movement to D, which in its turn, through the aid of the pawls G, imparts an intermittent motion to

F. The saw is mounted near the further edge of the carriage, and by working the lever E of either head block, that extremity of the log can be fed forward to any extent desired. This constitutes the mechanism for setting the log by hand.

I is a long straight bar mounted in suitable bearings, J J, on the near side of the carriage, B, and free to slide longitudinally therein. K K represent adjustable blocks mounted on I. On K is an upright projection, as represented, and E is slotted to fit thereon. The levers, E, of both the head blocks, C C, being thus connected to I, any longitudinal motion of the latter will set both ends of the log simultaneously. On the upper surface of I, near one end, is a rack, as represented, and adapted to receive the segmental gearing on the hand lever, N. By working N, therefore, the bar I may be moved at pleasure, and by adjusting the stop, O, in the curved slot represented at the side of N, the extent of the motion of the latter, and consequently the extent of the motion of the levers, E, and of the parts F F' may be graduated. This provides a very efficient means of setting both ends of the log simultaneously by hand.

It now remains to describe the device by which this latter movement is effected automatically. On the side of I is a stout projection, I'. On the side of the foundation, A, is mounted in a suitable housing, a vertical bolt, L, which is urged upwards by a spring, not represented. By the means now to be described, this bolt is at each motion of the carriage allowed to remain up until the stop I is brought in contact with it. In this position it holds I stationary, while the carriage moves onward until the levers E have been moved to a certain desired extent, when the bolt L is automatically depressed, and the projection I moves freely past it. The motion of the carriage, B, is then by the ordinary means reversed, and the stop I is again brought into contact with the bolt L, and the levers E E are consequently moved back, feeding both ends of the log forward till at the right point, the bolt L is again depressed, and the projection I moves freely past. None of the parts are again disturbed until the carriage has traversed the whole extent of one cut and returned.

The automatic motion of the bolt, L, is induced as follows:—On the side of L is a projection, not represented, extending towards the carriage, B. On the side of the carriage, B are mounted two hanging cams, S and T, which are distinctly shown in fig. 2. They are mounted in adjustable frames, V M, and confined by stops thereon, V' M', so that they can only swing in the directions towards each other. The automatic adjustment of the log is always effected after the carriage has been run entirely back, so as to be clear of the saw. When the projection, I' meets the bolt, L, the bar I remains stationary, thus moving the levers, E, and causing the pawls G to click over the rack, D, until the enclosed surface of the hanging cam, S, strikes the projection referred to on the bolt, L, and depressing it, allows the stop I' to pass, after which the bolt L is again allowed to rise. On the return motion, the projection I' again meets the bolt L, again stops the bar, I, while the carriage moves onward, and changes the levers, E E, back to their original positions, at which moment the cam T becomes effective, and in its turn depresses L by acting on the projection referred to and allows I to pass freely. By moving V and W into positions nearer together or further apart, the thickness of the boards or stuff sawed may be controlled with perfect accuracy, and the log is thus fed up to the saw without any assistance from the attendant until the whole is consumed, or so much thereof as it is desirable to saw.

This ingenious apparatus is the invention of Hiram Wells, of Florence, Mass., and was patented on the 9th of June last. It may, of course, be employed in connection with double or single saw mills, and is susceptible of many modifications. Either or both the levers E may at any time be lifted out of connection with the bar I, by simply grasping the handle, as represented, and the apparatus gives a very perfect control of the feed of the log in every respect. For further information address H. Wells & Co. at the above place.



Scientific American.

NEW YORK, AUGUST 29, 1857.

The Commissioner of Patents.—Who will he be?

Messrs. Editors.—It has long been a question with me whether Judge Mason would really resign the Commissionership of Patents, because of certain facts known only to myself and a few of Judge Mason's intimate friends. But since he has resigned, another question has arisen, and that is, "who will be his successor?" The position of Commissioner of Patents, as you are doubtless aware, is one which must needs be filled by the ablest and soundest minds. There are but few men who possess the necessary requisites for the office, and from their midst President Buchanan will doubtless make the selection. Having spent most of my time in Washington for the past ten years, and having been a great observer, I have thus been so situated as to "learn and see" for myself. I enjoyed not long since a conversation with a cabinet member, on the subject of the Commissionership, and was informed that but three candidates possessed the qualifications (in the eye of the President.) These were the Hon. Charles T. James, of Rhode Island; Dr. Thomas T. Everett, Chief Examiner of the Patent Office, and the Hon. Edmund Burke, who presided over the affairs of the Patent Office with such marked ability during the reign of the Polk dynasty. Either of these gentlemen would make an excellent officer. Gen. James is a man of no ordinary talent. He has seen much and read much, and being a decided mechanical genius, he would make a splendid officer. Dr. Thomas T. Everett is a New Yorker, of old Knickerbocker stock. He is the youngest brother of Hon. Richard J. Everett, of New Jersey, and has been an inmate of the Patent Office for nearly fourteen years. He is a gentleman of sound mind and clear understanding, perfectly conversant with the Patent Laws, and should he be appointed, he would reflect credit and honor upon the department. Of Edmund Burke I can add nothing to that which has already been said in his favor. Everybody knows his superior qualifications and all will rejoice at his appointment, if made. More anon. J. G. B. G.

St. Nicholas Hotel, New York, Aug. 17.

The above letter, written by an officer connected with one of the government departments at Washington, has a sort of semi-official character about it, and if reliable in its more essential particulars, it shows that the President is not unlikely to impose upon himself, and sacrifice in a measure the highest interests of an office which he is called upon to guard. We have not a word to say against the appointment of Dr. Everett or Edmund Burke. If the President sees fit to select either of these gentlemen to fill the office of Commissioner of Patents, the public will not object. Not so, however, in the case of Gen. James, and the mere mention of his name in connection with the office, and the somewhat extravagant praise which is heaped upon him by our correspondent, serves only to convince us that the latter has yet to "learn and see." We have nothing to do with Gen. James as a private citizen. In his proper place he is all well enough, for aught we know, and he might, as our correspondent suggests, make a "splendid officer," but it would be in the character of a General, rather than in the chair so lately vacated by one of the most gifted mechanical and judicial minds in our country.

If the President has any desire to examine into the special qualifications of General James for this office, we invite him to read over, only once, (for Mr. Buchanan is an eminent lawyer) the "New Patent Bill" published on page 292, Vol. 11, of the SCIENTIFIC AMERICAN, and once reported to the United States Senate; General James, Chairman, and putative father. We think after this perusal, which will not take long, the President will not be incumbered with more than two candidates in the above list.

This new "patent rat trap" bill—so denominated by some of our cotemporaries—never attained to the dignity of a hearing in the

Senate, and so far as the views of inventors and the public generally were expressed, it found no favor anywhere. The bill was a "monstrosity" in legislation, and was so treated.

With all due deference to our correspondents' opinions, we are satisfied that General James has not the peculiar qualifications, judicial and scientific, which would fit him to succeed Judge Mason. Besides, if we mistake not, he has some interest in the extension of certain important patents, which have been the subjects of considerable litigation. Should this prove to be true, (which we do not affirm) it alone ought to shut the Office against him. It is our opinion that General James is quite as likely to be struck by lightning as he is to become Commissioner of Patents; and that the President ever thought of conferring that office upon him, we do not for a moment believe. We should almost as soon look for the appointment of C. C. Chaffee, or either of the other members of the late Committee on Patents in the House of Representatives. Indeed, we think the President should not overlook these parties; they should be rewarded for the service they rendered to the mechanical interests of the country in withholding their report against the extension of the Woodworth Patent until it had expired—until every spark of hope for getting the bill through had fled.

In addition to the names above suggested, rumor mentions S. T. Shugert, Esq., now Acting Commissioner, Colonel Hughes, of Baltimore, a well known engineer, Judge Ingersoll, of New Haven, a United States Circuit judge, and Judge Sherman, of Michigan.

The Zodiacal Light.

With all the progress of modern science there are many matters, even in the fields most explored, which are, as yet, extremely obscure. It has been proved that our earth is enclosed in an atmospheric coating, which diminishes rapidly in density as we ascend through it, so that one half of its weight lies in a stratum within a thickness of three miles of the level of the sea. How much above this the fluid may extend before it becomes so thin as to be considered absolutely nothing, is only a subject for conjecture; but there are reasons for supposing that the extreme limit of the atmosphere is not more than from forty to sixty miles above the earth, and its tenuity is such that no balloons, birds or insects can fly higher than four or five miles. Beyond the limits of our atmosphere exists either empty space, or space believed to be uniformly filled with an extremely light and almost imperceptible ether, which is of sufficient consistency to convey the pulsations which we term light and heat, from the sun, and probably to retard, in some as yet imperceptible degree, the motions of the various planets, comets, etc., which compose our solar system; but with this exception, the traveler who should, like Shelley's *Queen Mab*, travel through those regions is supposed to pursue a way more uninteresting than even that of the overland mail to Utah; in short, the space is supposed to be "filled with emptiness" except in the immediate vicinity of those planets which are enveloped in atmospheres.

But there are three classes of appearances which can only with great difficulty be made to tally with this theory, or, indeed, with any other. These are meteors or shooting stars, the aurora borealis or polar light, (the term northern light is evidently local, as it is equally observed about the southern pole,) and a mysterious hazy and changeable appearance, the zodiacal light. The latter alone was the subject of two papers read at the late meeting of the Scientific Association at Montreal, and will be amply sufficient for our present brief notice, leaving the others for a more leisure hour.

Capt. Chas. Wilkes, of the United States Exploring Expedition, who had enjoyed opportunities of seeing it from almost every portion of the earth's surface, thinks the zodiacal light consists of a perpendicular column of the atmosphere, directly over the point at which the sun is at the moment vertical, while the Rev. George Jones, who has observed it with care for a considerable period through the clear atmosphere of Quito, in Ecuador, South America, a city situated a mile

above the level of the sea, finds the zodiacal light visible entirely across the sky from west to east, and thinks that his observations completely establishes the fact that this light is a circle surrounding the earth. In short, he thinks our earth is encircled by a ring like the rings of the planet Saturn, but somewhat fainter. He has worked out all the elements of this ring, and shows that it forms an angle of 32° 20' with the ecliptic, the ascending node being at longitude 62°. The width of the ring is about 28°, as seen from Quito, and its distance from the earth something like 100,000 miles, or about twelve times the diameter of our planet, and nearly half the distance of the moon. If this be established, the diagrams to be used in future lectures and books on astronomy must be very materially altered, and a ring of considerable thickness, but of unknown breadth must be supplied. That this is no idle whim is shown by the fact that it was developed at some length in a convention of the highest scientific authorities on the Western Continent, and received with considerable favor. Professor Peirce (B. Peirce, of Cambridge, we presume) is reported as speaking at some length of the novelty, value and interest of this view of zodiacal light. He said we might be proud of its origin in our country, but we should also be careful that all necessary criticism should come from our countrymen. The zodiacal light, he thinks, cannot be composed of small pieces, because it can readily be shown that they would pass in conflicting currents. But, he asks, "if gaseous, why does it not show the great tides which our large and heavy moon would produce? That it is really a ring is manifest, but there is a difficulty in reconciling the existence of a ring with the non-appearance of tides in it."

The subject is one of the class of speculations on which we presented our opinion at sufficient length last week, but also one the magnificence and the unexplainable character of which is peculiarly interesting. It is said that the beauty of this light in the tropics cannot be imagined by those who have only seen it in our northern twilight.

The Adriatic.

It is now confidently expected that the steamship *Adriatic* will make her trial trips during the month of September, and it is even hoped that she may be ready to take her place in the line by Sept. 12th. The extensive alterations are now approaching completion.

The condensers are surface condensers, with a vacuum both without and within the tubes. The tubes lie horizontally, and receive the steam to be condensed in their interiors. Allowance for the expansion and contraction of the tubes is made, by allowing the heads, in which the tubes are inserted, to go and come on guides or slides provided for the purpose. In each condenser there are two nests of tubes connected to separate heads or hollow shells, and presenting a sufficient amount of surface to condense the steam very rapidly. The salt water which surrounds and circulate, among the tubes is enclosed in a stout vessels and a vacuum is maintained on the whole, there being one air pump for the salt water outside the tubes and shells, and another for the fresh water, air, and uncondensed steam abstracted from within the tubes. The air pumps are worked from eccentrics on the main shaft, the friction of which, though necessarily great, can hardly produce any difficulty, as the eccentrics are made very wide, and great care is taken to prevent the possibility of heating. The actual width of the bearing surface of each eccentric is 18 inches, and the diameter is about four feet. The throw will be increased by stout levers intervening between them and the pumps. All these parts, and, in fact, the whole ship, with the exception of the valve motion, will be completed by the 1st of September.

The valves now to be employed are balance puppet, similar to those in general use on American steamers for the ocean and lakes. The valve motion is constructed on Sickles' patent of 1845, but with some peculiarities adapting it to the circumstances under which it will be compelled to work in this vessel. The *Adriatic* has inclined oscillating engines,

and the stems of the valves will, at some parts of the stroke, lie in a very much inclined, in fact, in nearly a horizontal position. The angle made with the horizon at one point is only about 22 1-2 degrees. As the valves are to descend principally by gravity, it has been deemed necessary to provide especial means to insure their prompt descent. The exhaust valves are pulled down by positive mechanism, and the steam valves, besides the anti-friction wheels or rollers to ensure an easy motion, will probably be urged downward by the tension of powerful springs, if such are found necessary. The construction of the valve motion is now being pushed with all the energy possible. Some of the parts are being finished at the Novelty Works, where the ship lies, other parts at the Allaire Works, Secor's, and several other shops in the city and vicinity. A part, we believe, is even being constructed at Providence.

A Handsome Present.

It is not expected that one person will receive a present of \$1,500 for obtaining the 15 largest lists of subscribers for the new volume of the SCIENTIFIC AMERICAN, but any young man may make \$300 or \$500 with ease and devote but little time in doing it if he will follow our advice. It is this:—Take a copy of our new prospectus, and in the evening, or any other spare time, call upon his shop-mates, his neighbors, his townspeople, or any persons he thinks would like the SCIENTIFIC AMERICAN, and ask them to subscribe. By a little effort, any one can get a prize of greater or less magnitude, and we hope our young mechanics will avail themselves of this opportunity of earning a few hundred dollars for themselves, and at the same time confer a favor upon us by increasing our circulation, and on the subscribers they obtain, by furnishing them information worth many times more than its cost.

One person may form any number of clubs and thus get several prizes. Subscriptions may be sent from different Post offices and at any time previous to January 1st, 1858. See prospectus giving full particulars, or last page of this paper. Send to the publication office, 128 Fulton street, for printed prospectuses and circulars.

Commissioner's Report for 1856.

We are indebted to S. T. Shugert, Esq., Acting Commissioner of Patents, for copies of volumes 1 and 2 of the Commissioner of Patents' Report for 1856. Our readers will do well to bear in mind that only two thousand copies of this report are placed at the disposal of the Commissioner of Patents for the purposes of official distribution; the balance is sent out by members of Congress. Therefore, those who may wish to procure a copy, and who cannot be supplied through the Patent Office, will do well to send an early request to the Representative in Congress from their district. Vol 3, which will contain engraved plates of the various patents, is not yet issued; thus realizing the trite old saying, that "large bodies move slow."

The introductory remarks of Judge Mason to this report will be found on page 198 of this volume of the SCIENTIFIC AMERICAN.

Death of Doctor Dick.

Our late foreign exchanges announce the demise of this venerable christian philosopher and man of science. He expired at Broughty Ferry, in Scotland, where he had lived for the long period of more than thirty years, prosecuting his astronomical studies, engaged in the labors of an unostentatious benevolence, and enjoying the warm respect of all around him. He had attained the ripe old age of eighty-three. The removal of one who had so far exceeded the ordinary limit of human life is scarcely a matter of surprise; but the example of his calm, genial, honorable, and useful history is one that should not be without its salutary influence. A year or two ago, his services in popularizing science were acknowledged by the gift of one of those scanty pensions which are allotted as the reward of such labors.

Mortification in a wounded or diseased part may sometimes be prevented by surrounding it with charcoal.

**Hulling Cotton Seed.**

An excellent machine for hulling cotton seed was patented a few weeks since by Wm. R. Fee, of Cincinnati, O. It is said to overcome the great difficulty heretofore experienced in hulling this seed, and is represented to cut the covering of the seed without bruising, mashing, or expressing the oil therefrom. The seeds, after being cut, are subjected to a screening operation, which effectually knocks the kernels out of the divided hulls. The inventor has been extensively engaged in the manufacture of cotton seed oil in Cincinnati, and has, we learn, successfully introduced his improved machine in several of the large cotton seed oil factories in different States.

**Rapid Photography.**

Experiments were made in Bombay in November, 1855, for the purpose of estimating the limit of the photogenic action of the direct solar rays, and also, if possible, to measure the diameter of the sun within a small fraction of a second of angular measurement, by combining the photographic and the electric telegraphic processes, employing photography to estimate the element of time. The general result of the first experiment is, that it requires an exposure to the direct light of the sun for only one twenty-thousandth part of a second in order to obtain on a plate coated with collodion an impression, which may be completely developed by the ordinary processes.

**The Great Eastern.**

It is now said, we do not recollect on what authority, that the *Great Eastern* has been engaged to make three trips to this country instead of one, and that not only are excursion tickets to be issued to allow passengers from Great Britain to come to this country and stay some six weeks and return at very reduced rates, but tickets for the European tour are to be sold in the same manner on this side. If this plan is carried out we may expect a renewed impulse to be given next year to the already very fashionable and instructive practice of traveling to Europe. By the way, we may here express an opinion that nothing is better for a gentleman of forty who has closely applied himself to business till life has become dull and monotonous, than a tour of from three to ten months in the great centers of attraction in Great Britain and Europe, while nothing is worse for a young man just forming his character than the same method of spending that amount of time.

According to the August number of the *Artizan*, the work on this great steamship is now progressing quite successfully. The whole of the hull is completed externally, including riveting and caulking. The arrangement for supporting the rudder has been reconsidered, the present arrangement being that the heel of the rudder is stepped into a suitable bearing projecting from the rudderpost, whilst at the upper end, within board, it has a circular cast iron flange, fitted with friction rollers, which works upon a table supporting the entire weight of the rudder, the flange, with its rollers, being similar to a small turn table; thus the power required for working the rudder to steer the ship will be but small, and the wear upon the step will be trifling.

The paddle wheels are now completely framed together, and fitted permanently upon the paddle shafts ready to receive their floats.

The scuttles for the ship's sides are being put in. There are 300 large galvanized cast iron frames, fitted with brass lights 14 inches diameter clear opening, glazed with inch glass; they are strong and well fitted together; the annular groove in the brass frame is fitted with cork, for rendering the joint water-tight. There are also 200 smaller lights similarly constructed; the frames are glazed with three-quarter glass, 8 inches diameter clear of frame.

Before the beginning of 1858 the whole of the joiner work will be complete and ready for the decorators, upholsterers, &c.

**Air Engines Again.**

Since the air engines of the steamship *Ericsson* have been changed to steam engines and the furnaces, regenerators, compressing pumps, &c., of the "caloric" apparatus re-

moved to make way for the more practically approved boilers, condensers, air pumps, and other paraphernalia connected with the now common-place steam engineering, little has been heard of Captain Ericsson or his plans, but he has not been idle. Profiting, or endeavoring to profit, by the experience obtained in each succeeding effort, he has continued to build and modify his favorite style of engine, having completed we think seven dis-

tinct machines, mostly double cylinder engines of comparatively small size, since his last trial on the ship. He has now floating in the Hudson a small steamer, or *air-er*, about seventy feet long, which he has succeeded in driving at a good rate by the combustion of an almost incredibly small quantity of pine kindling wood. There are two engines, horizontal, single acting, and apparently about thirty inches diameter by

thirty-six inches stroke. The vessel is an open boat, or mammoth yawl, and the paddle wheels are about ten or twelve feet in diameter. We believe air alone is the fluid employed as a medium to generate the power but cannot say whether the regenerator or other of the features principally relied on in the former efforts are still employed. We shall endeavor to keep our readers posted, if anything of importance is developed.

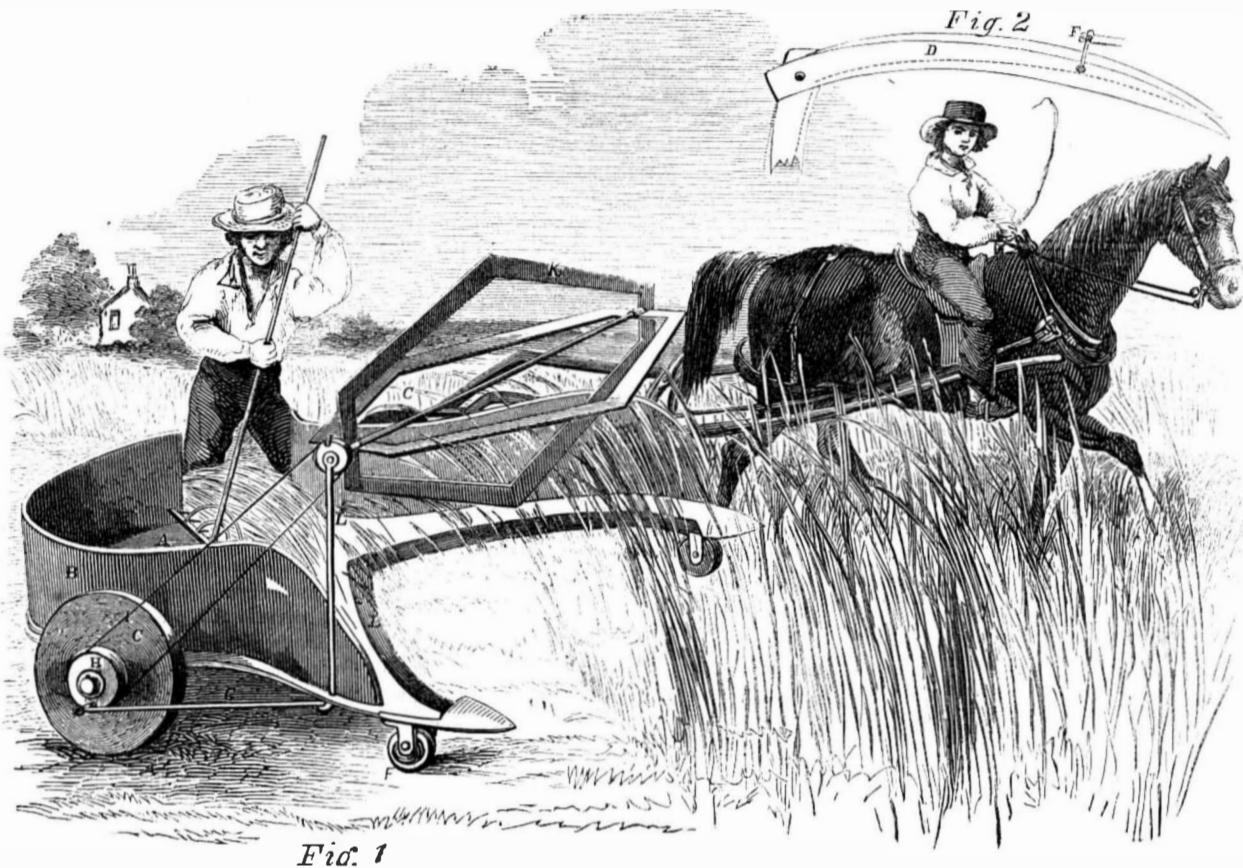
**GUMAER'S HARVESTER.**

Fig. 1

Fig. 1 is a perspective view of a harvester invented by S. Gumaer, of Chicago, Ill., and secured by patent dated August 4, 1857. The peculiarity is chiefly in the cutters and in the means of presenting the grain thereto. Fig. 2 represents the cutters separate from the machine.

A is the floor or platform, and B B are the elevated sides. C C are the ordinary large bearing wheels, D D are cutters somewhat resembling large knife blades or scythes, E E are leading wheels, which support the weight of the front edge of the platform, and F F are bell-cranked shaking levers, by means of which, through the intervention of the connecting shaking rod, G, a shearing motion is imparted to both the cutters. H is a pulley on one of the wheels, and I a belt which communicates motion therefrom to J, a small

pulley on the shaft of the reel, K. The reel, K, is of greater diameter in the middle than at the ends, a form adopted in many other descriptions of reapers, and is mounted on standards, L, at the proper elevation to gently strike the grain and incline it over toward the knives at the best angle for cutting. As the machine is moved forward by the horses, the connecting rod, G, generates a peculiar and reciprocating motion in the cutters, C C, and the straws are severed along the edges of the knives by an ordinary cutting action, like that of a scythe, and at the junction of the cutters by an additional shearing action analogous to that of scissors or shears.

The machine may be driven at any speed, as there are no parts which reciprocate with such velocity as to endanger the safety of the machine, or to absorb power by such motion

in any serious degree in fact, the cutting is performed more efficiently and perfectly with the machine driven at a tolerable speed than when driven very slowly.

Mr. G. estimates that the weight of this harvester will not exceed 400 lbs., and it can be afforded to the farmer at retail, ready for use, at \$65. This latter is a very important consideration, and the former is little less so, as the side draught depends much on the weight of the machine.

The claim of the inventor comprises the combination of the blades, D D, with the peculiarly constructed platform, A, and the center swell reel, K, when said parts are arranged to operate in relation to each other, as and for the purpose set forth.

For further information, the inventor may be addressed as above.

**Ventilation of Buildings.**

The mode of ventilating the two new halls of Congress is to be as follows:—A column of air, previously passed through hot water pipes in the winter, and through jets of ice water in summer, is to be forced, by means of a large fan worked by steam, up a hollow shaft to the space between the roof and ceiling, through the latter of which, being thoroughly perforated, it will gain admission into the room, and displace the vitiated air through apertures in the base of the walls. This theory of ventilation is original with Capt. Meigs, and is yet untested, and doubts have been expressed by scientific men of its practicability. However, if it should be found impracticable to introduce the fresh air from the top of the room, the ventilating apparatus will be so arranged as to introduce it from the bottom, without any material alteration or additional expense.—*Washington Union*.

[We can see no difficulty in this except the power and attention required by the fan, and predict that the ventilation will be very perfect. It will be necessary to provide pretty carefully against allowing any sound from the fan to reach the interior of the halls.

**Saleratus vs. the Teeth.**

The bony portion of our frames are covered with flesh, and preserved from all direct external influences, except the thirty-two bones which we (some of us!) use in masticating our food. These are generally a great source of trouble, and it is perplexing to find authorities differing very much with regard to the effect of various agents on them. At the Dental convention lately in session at Boston, some of the dentists asserted that the main cause of defective teeth was the use of saleratus and cream of tartar in the manufacture of bread, and Dr. Baker gave the results of some experiments which he had made by soaking sound teeth in a solution of saleratus. The teeth were destroyed in fourteen days. Mr. Spaulding, of St. Louis, did not believe that alkali in general injured the teeth, but acknowledged that saleratus did.

**Manufacture of Combs.**

It is said that the greatest comb manufactory in the world is in Aberdeen, Scotland. There are some two thousand varieties of combs made. There are thirty-six furnaces for preparing horns and tortoise shell for the

combs, and no less than one hundred and twenty iron screw presses are continually employed in stamping them. Coarse combs are stamped or cut out—two being cut in one piece at a time. The fine dressing combs and all small tooth combs are cut by fine circular saws, some so fine as to cut forty teeth in the space of one inch, and revolving five thousand times in one minute. The annual consumption of hoofs amounts to 4,000,000.

**The Twist in the Transatlantic Cable.**

From a card published by Messrs. Newall & Co., who commenced last and finished first the construction of half the great cable, it appears that both the cable-manufacturing companies twisted their portion according to samples sent them, that N & Co.'s sample had been received a long while before, and the Directors, Engineer, &c., of the Telegraph Company had been changed in the interval. The fact that the lay of the two halves was different was discovered during the experiments for testing the strength, soon after both establishments had commenced the rapid manufacture of the cable, but neither was willing to change the twist.





Science and Art.

Steam Cultivation.

Among the tolerably promising devices for plowing or loosening the earth by steam power should be mentioned a steam spading machine, recently patented by G. M. Ramsay, of this city. It is a locomotive with a series of spades behind, to operate in such a manner as to propel the wagon ahead, like the stern wheel to a shallow river steamer, and at the same time to pulverize the soil to any desired depth. The spades are worked by two cranked shafts, which latter are mounted one above the other in an adjustable frame. Dr. Ramsay is now seeking for a capitalist to assist him in bringing it out.

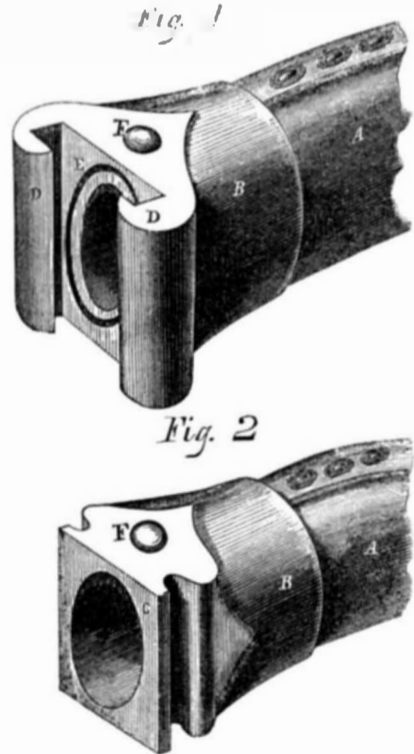
Falconer's Hose Coupling.

With the hose couplings now in use, great difficulty is encountered in effecting a junction or coupling while the water is flowing through the hose; and in the cases where a head of water, force pumps, or fire engines are employed to force the water, the supply must be shut off above the break in the line of hose. The screw coupling now generally used by the fire departments is also objectionable for other reasons, it requires considerable time to "set it up," and complete the joint.

The coupling represented in the accompanying figures has been used by the Perseverance fire company, of Washington, D. C., since April, 1855; and it has been found, by actual experiment, that there is no necessity for shutting off the water, and that the union can be effected with the water flowing, no matter how forcibly. The joint is set up and made tight by a single blow from a mallet, and it may be broken or separated with equal facility.

The halves of the coupling are held together by a species of dovetail, and the joining and separating is similar to the motion of an ordinary draw slide. The parts are made a very little tapering or wedging, so that the faces are drawn together very tightly, and a ring of leather or rubber allowed to project from the face of the female part, makes a perfectly tight contact with the plane face of the other part.

Fig. 1 shows the female, and Fig. 2 the male parts of a coupling. A is the hose and B the metallic neck, in each; C is the dovetail, and D D the stout, lipped flanges on the other part which embrace C. E is the pro-



jecting collar of packing material or the hose itself, which fits tightly against the face of C, and F F on each part are simply projections to receive the blows of the mallet or hammer, two or three of which only are required at any time to effect a junction or separation even if the water is flowing very rapidly through the hose.

The new coupling makes a tighter joint than the screw coupling, is not so liable to choke from grit or ice, costs considerably less

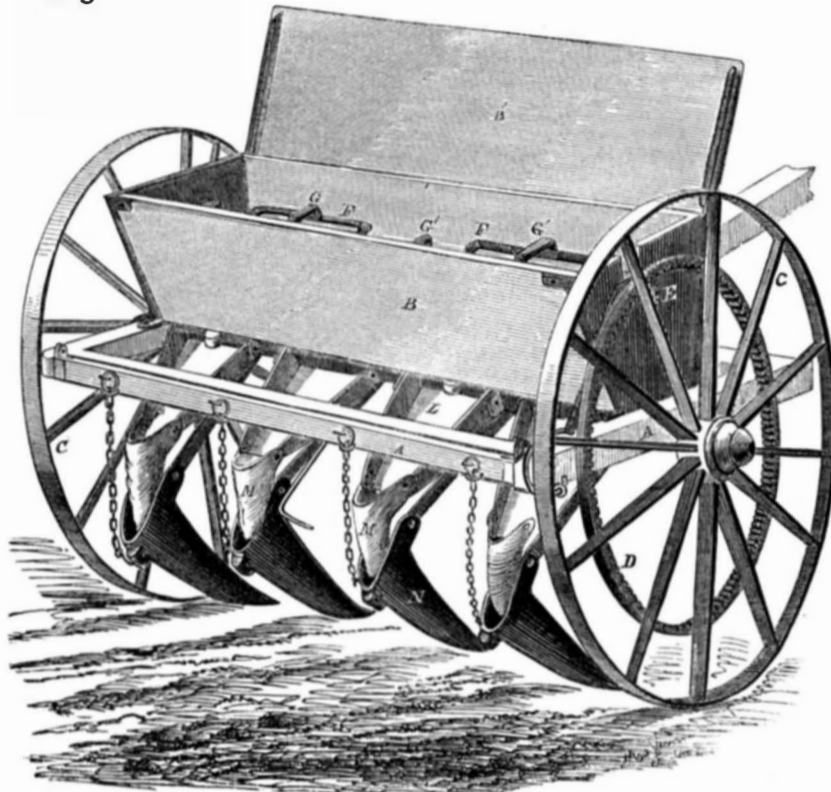
in the manufacture, and presents a much neater appearance than the screw coupling. But its great advantage at fires is the saving of time. Time is all important at a fire, and the loss of five or ten minutes in connecting with screw couplings undoubtedly has often

determined the issue of an extensive conflagration.

This coupling was patented June 9th, 1853, by R. J. Falconer, of Washington, D. C. For further information or for rights, address Prof. Chas. G. Page, of Washington, D. C.

MEYERS' SEEDING MACHINE.

Fig. 1.



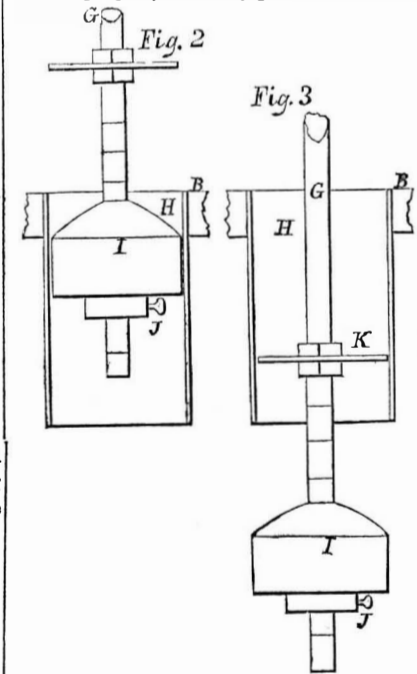
L. B. and H. A. Meyer, of Massillon, Ohio, are the inventors and patentees of the machine seen in the accompanying engravings. It is adapted to the planting of seed alone, or to the depositing of any fine fertilizer therewith. Provision is made for depositing in drills, or scattering broadcast at pleasure.

The seed or fertilizer is measured off and deposited by the working of double pistons, through holes in the bottom of the seed box, and at each movement an amount of seed equal to the space inclosed between the pistons is allowed to descend through tubes. In case it is desired to plant in drills, it is let down through flexible spouts into the drill, but in scattering broadcast, it is thrown upon conical deflectors, and allowed to scatter as much as possible.

Fig. 1 is a perspective view of the whole machine, and figs. 2 and 3 are sections of the bottom of the seed box, showing the pistons first in their highest and second in their lowest positions.

A is the frame of the machine; B the seed box, and B' the cover; C C are carrying wheels; D is an internal gear on one of the wheels, and S a pinion meshing therein; F is a cranked axle on which E is fixed; G' are "spade handles" on the upper ends of the piston rods, G; H are short feed cylinders secured in the bottom of the seed box, B; I represents the lower pistons, and J set screws by which they may be secured at a higher or lower position on the piston rods, G; K represents the upper pistons which are merely disks of leather or rubber, and L the discharge trough through which and the flexible spout, M, the seed is allowed to descend at each revolution of the shaft, F; N N are digging

spouts which serve the double purpose of excavating the drills or channels, and providing a passage for the seed to the bottom thereof. In other points the machine is fitted up like other of the most approved machines for this purpose, and every provision is made



against derangement, and for combining great strength and durability with lightness and ease of working.

This machine was patented on the 3d of March last. For further information address either L. B. Meyers or H. A. Meyers, Massillon, Ohio.

Something New in the Iron Trade.

The Liverpool Courier announces that John Harding, the managing partner in the Beeston Manor Iron Works, Leeds, has taken out a patent for an improved method of freeing iron and other metallic ores from the rock and shale in which they are generally imbedded. As those who are familiar with the iron trade are aware, it is necessary to remove this extraneous rubbish before the ore is sent to the blast furnace, and hitherto the mode of accomplishing this has been by exposure to the air, by which the rock and shale was loosened, after which it was chipped or "napped" off by manual labor. This was a work of time

and involved considerable cost, and the object of Mr. Harding's patent is to diminish both the one and the other. Instead of exposing the stone to the air, it is enclosed in a structure for the purpose, and subjected to the action of steam, which effects in a few hours that which often, under the ordinary method, takes months or years to accomplish, the shale and rock falling off of themselves, and rendering almost unnecessary manual labor for "napping." The invention has been seen by some of the leading men connected with the iron trade in the district, who are satisfied of its value and efficiency; and it may yet be very extensively operated.

Literary Notices.

SCIENCE OF COMMON THINGS—A familiar explanation of the first principles of physical science, for young students. By David A. Wells, A. M.; Ivison & Phinney, New York, 1857, 12 mo., 324 pp. A great objection to works of this kind is that they are necessarily too concise to convey scientific knowledge. Brief generalizations of truth are frequently met with in the pages of error in the natural sciences. Having said this we are free to add that after careful examination we unhesitatingly pronounce this the best book in its line which has ever yet appeared. It is almost invariably clear and correct, and interlards the exposition of principles with many valuable facts relating to each of the subjects treated on.

THE ECLECTIC MAGAZINE, for August, contains a fine engraving and likeness of Agassiz, the most eminent naturalist now living, accompanied with a brief biography. It has also an able article from the Westminster Review on "Progress: its Law and Cause," besides others of solid interest. We are happy to learn from the editor that the Eclectic is in a prosperous state. It well deserves success, as it is a sterling magazine, and should have a circulation equal to its character and value. W. H. Bidwell, Publisher, No. 5 Beekman street.

A MANUAL OF ASTRONOMY AND THE USE OF THE GLOBES. By Henry Kidder, A. M., Ivison & Phinney, New York, 1857; 12mo., 171 pp. This is a school-book on a science which is very sublime and ennobling, but is practically useless to those for whom this book is intended. The first four pages are ordinary valuable definitions of geometrical terms—the remainder is dry, and far inferior either in correctness or attractive character to many other astronomical books.

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