New Inventions.

Ports of Steam Engines.

J. P. Joule, F.R.S., suggests that it would be very desirable to abandon the practice of using the same port for both the induction and eduction of the steam to and from the cylinder, since by this method the temperature of the exhaust steam is raised by coming in contact with metal which was the instant before heated by the induction steam, and the induction steam is cooled by contact with metal which has just before been exposed to the exhaust steam. No doubt a loss of elegance and compactness would result from employing separate ports, but this would be far overbalanced by the real advantages gained.—*London Mechanics' Magazine.*

New Leveling Scraper.

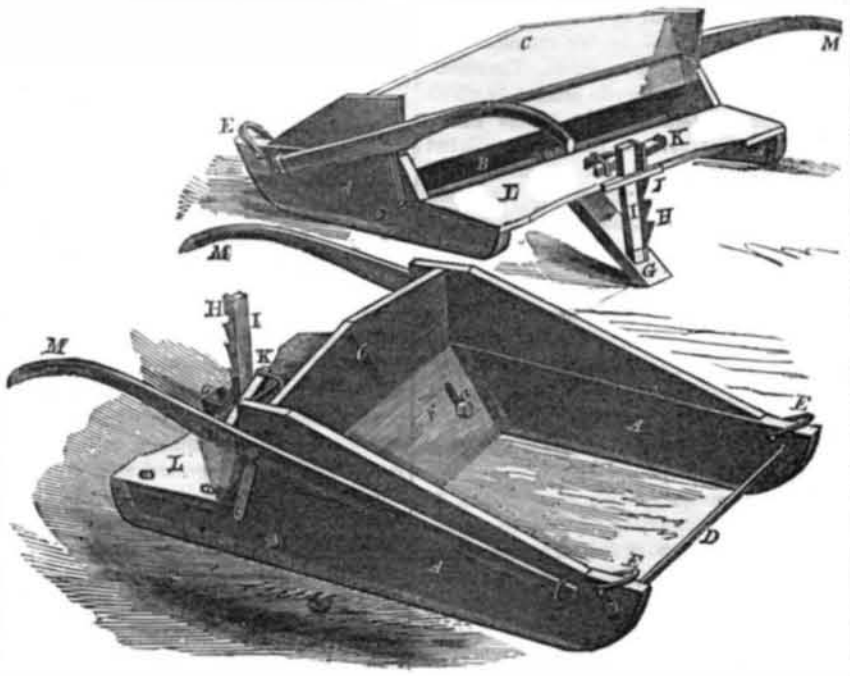
Chauncey Blakeslee, of Ashtabula, Ohio, is the inventor of the valuable labor-saving device of which two views are given in the accompanying engraving. It is designed to operate on roads, lawns, or in any situations where grading alone is the effect to be produced. It may be used with good effect in leveling and rendering more equable the surface of snow when a path has, as is frequently the case, assumed the character of two deep channels with a hard ridge between them, or when a road has become worn in transverse wave-like ridges or cradle holes. Its operation is very similar to the ordinary scraper, except that it is perfectly self-acting in the labor of receiving and discharging the dirt; and although handles, M, are provided, as represented, to facilitate any manipulation of the implement desired, the draft of the animals is applied at a point so far forward of the edge of the scraper that no strain is thrown upon the hand under any circumstances, thus avoiding the propensity of the common road scraper, to throw the operator over it when it meets with an obstruction.

A represents the runners or sides of the scrapers, the lower edges of which are shod with stout iron, to resist the wear upon the earth. B represents an inclined back, which carries, by the aid of bolts, *a*, the stout metallic plate, F, which is the scraper proper. The bolts, *a*, are inserted through slots, as represented, so that F may be shifted down upon B as its lower edge wears away. C is a board standing perpendicularly or inclined forward above B, to prevent the accumulated earth from falling over the upper edge of B. D is a cross brace, and E E are simply clevices to which the animal or animals are attached. G is a kind of gage turning upon a transverse bolt represented near B. The duty of G is to elevate the rear end of the whole scraper to any extent desired, so that the implement shall be supported upon but three points—two near the forward end of the runners, A, and the third at the rear extremity of G. The letters H I J and K represent the means employed for fixing G in any position desired. I is an arm attached to G, and H is a kind of metallic rack fixed on I. J is a stout metallic cross piece, and K is simply a spring which urges I into close contact with J. Supporting the weight of the hinder part of the scraper by the hand and compressing K, the rack, H—and consequently the gage lever, G—may be changed to any position desired.

Supposing the plate or scraper, F, to project a certain distance below the bottoms of the runners, A, it is easy to find by trial such a position of the gage lever, G, that when on level ground the lower edge of F will be nearly or quite in contact with the earth. This is the ordinary position for work, but it must be somewhat varied to adapt it to different circumstances. Whenever the implement passes over an uneven surface the scraper, F, digs off the elevated parts, and drops the material thus removed in the first depression which presents itself. It would probably be very efficient in leveling or extinguishing the deep "ruts" or wheel tracks which are always found in most roads, as by properly setting G the plate F would be made to carry constantly before it a slight accumulation of earth, which would effectually fill the rut; and a few repetitions of the operation, allowing the soft earth to be well compacted therein after each attempt, would soon entirely obliterate even the most desperately deep and cruel channels of this kind, and make the road smooth and uniform.

There are many other uses to which the device may be profitably applied, such as

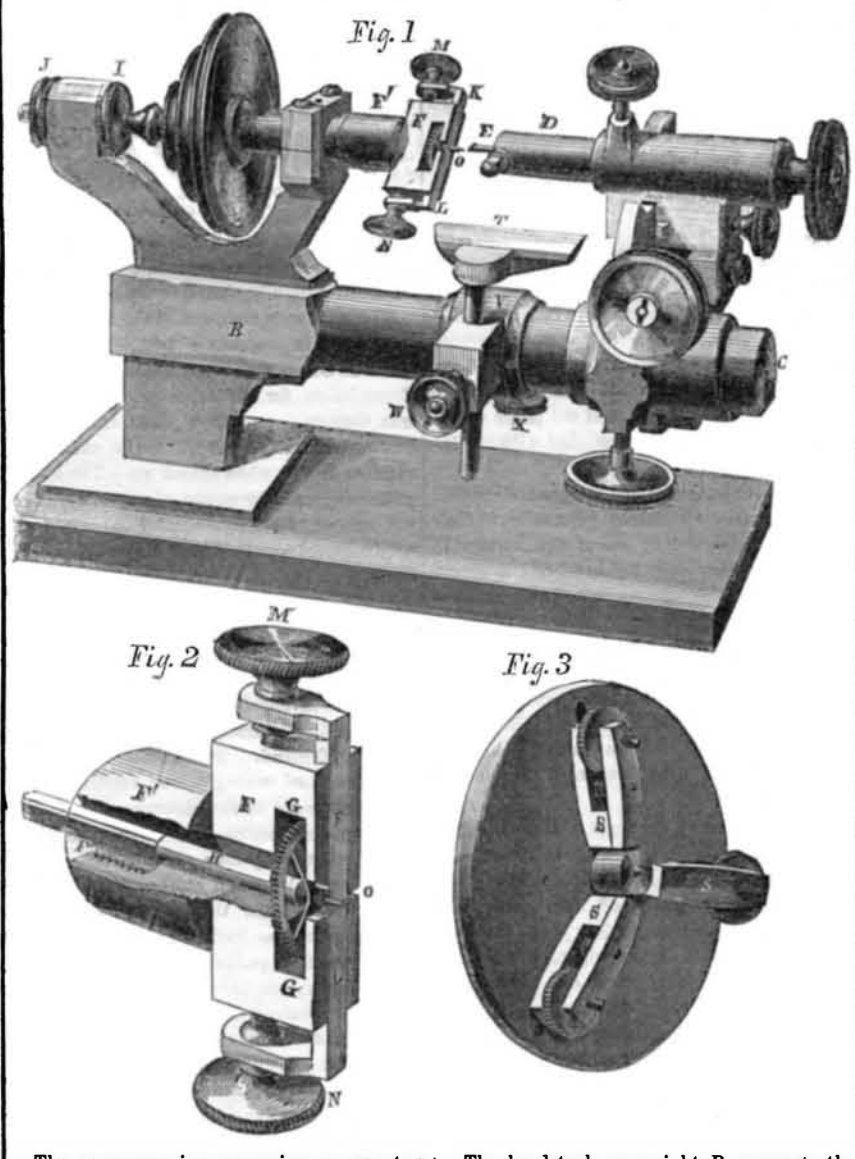
BLAKESLEE'S LEVELING SCRAPER.



leveling mowing land preparatory to rolling, etc. For some, perhaps for most, purposes, it is desirable to give a curved outline to the lower edge of F, so that the shallow channel excavated shall have in no case any perpendicular sides. The implement seems very durable and simple, and little liable to get out of order.

Any further information relating thereto may be obtained by addressing the inventor, C. Blakeslee, Ashtabula, Ashtabula county, Ohio.

STEPHENS' LATHE FOR JEWELERS.



The accompanying engraving represents a lathe for jewellers and watchmakers, which is the subject of two patents granted to Mr. Wm. Stephens, of Richmond, Ind. The first, granted on Feb. 20, 1855, is for the peculiar and admirable slide rest seen on the right in Fig. 1, and which having been quite fully presented on page 233 of Vol. 10, SCIENTIFIC AMERICAN, need not be again dissected. The later invention, a chuck for holding small work, patented March 10 of the present year, is the subject more particularly before us.

The headstock or upright, B, supports the cylindrical spur or projection, C, which extends horizontally therefrom and carries the small cutter or tool, E, in the cylindrical bar, D, the position and motion of which latter is perfectly controlled by the devices intervening between D and C. F is the head or acting portion of the chuck, and F′ is a cylindrical stem containing a hollow or female screw, F″, (see fig. 2,) by which it is attached to the ordinary arbor or mandrel. G represents a slot in F of sufficient size to accommodate any wheel which may be on the pivot to be finished. H is a small "back center" fitting tightly in a corresponding hole bored precisely in the central line or axis of motion. The front end of this small center is hollowed out in the form of a hollow cone, so that any shaft or pivot pressed into the cavity necessarily assumes an exactly central position. This center, H, may be moved backward or forward to accommodate various lengths of pivot to be turned, but fits suffiently tight in F, to be retained by friction in any position where it may be placed. K and L are accurately finished bars, fitting in dovetail grooves across the face of F, and made to slide therein by turning the screws M and N. The ends of these are finished each with a small notch, so that the slides K and L clamp and confine very firmly the pivot near its front end, and allow of its being adjusted with great accuracy. In Figs. 1 and 2, a pivot, O, is shown mounted with its projecting end ready to be turned and with a wheel and pinion standing untouched in the opening G. T represents an ordinary hand rest, V, a support therefor, and W and X pinching screws, by slackening which the position of T may be adjusted.

Fig. 3 represents a face plate to take the place of F when any larger work is to be either turned or drilled. S S S represent clamps, by properly adjusting which the work may be firmly held in any desired position on the face plate, either concentric or excentric to the periphery thereof.

As a whole the lathe is very simple, convenient, and admirably adapted to the wants of a very large class of operators. The advantages to be derived from this firm and easily adjusted apparatus, over any of the methods of fixing with cement, must be obvious at a glance.

For further information address the agent, Mr. G. M. Bodine, No. 22 Maiden lane, New York.

The American Nautilus in England.

The American Nautilus, or submarine diving machine, invented by Major Sears, is now at work in London, and a company has been formed to operate with this apparatus. A short time since, a number of scientific gentlemen and engineers were invited to see the Nautilus in operation at the Victoria docks. After the experiments were completed, a repast was given to those present, on which occasion Robert Stephenson, C. E., M. P., made a brief speech, which is not a little flattering to the inventive genius of our countrymen. He stated, that by a careful examination, it appeared to him to possess so many qualifications as a diving bell, (a machine hitherto very confined in its practical operations,) that it might truly be called *a universal diving bell.* It appeared to him to combine the highest class of mechanical skill, with great ingenuity in detail.

Mr. Bidder, the engineer of the Victoria docks, stated that great difficulty had been experienced at these works in operating with the diving bell, but when the Nautilus was applied, the amount of labor which had previously required three weeks and four days for its execution, was performed in two days and two hours with the same number of men. He also stated, that from his own personal experience in the Nautilus, he was convinced that nearly the same amount of masonry could be done under water as on dry land.

The Nautilus in London was constructed under the superintendence of Mr. J. N. Williamson, an American engineer, who is in charge of it, and whose mechanical skill has been signally displayed in all its arrangements.

The Longest Iron Viaduct in the World.

An immense iron bridge has recently been constructed over the river Ebbw, on the line of the Newport, Abergavenny and Hereford Railway, in England. Its hight is 200 feet, and beneath it runs the river and the track of the Monmouthshire Railroad. It consists of ten spans, each 150 feet long, of hollow wrought iron girders, supported on tall iron columns. With the approaches, the length of this bridge is 1760 feet.

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