(No Model.) 4 Sheets—Sheet 1.

F. MEISEL.

MACHINE FOR DRESSING STONE.

No. 294,401. Patented Mar. 4, 1884.

Fig 1

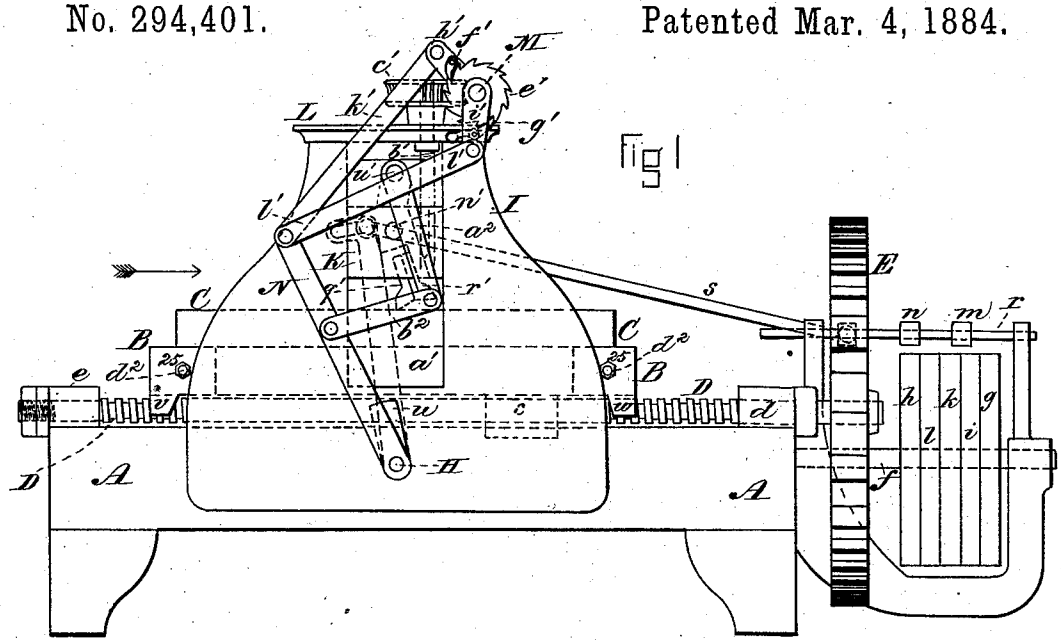
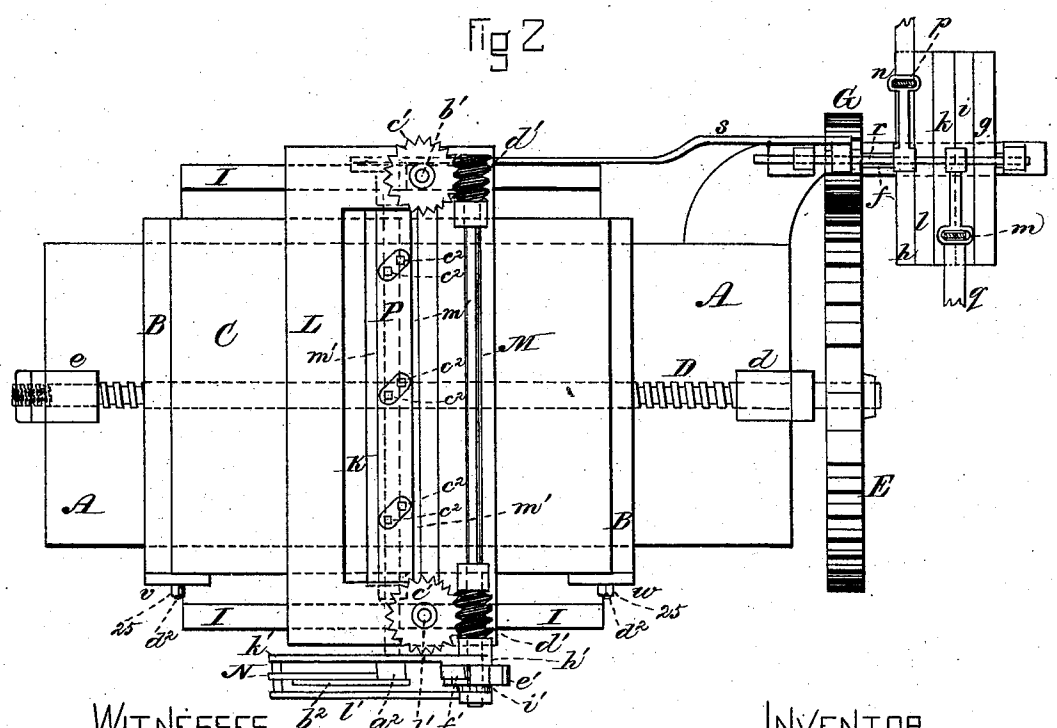


Fig 2



WITNESSES

W. J. Cambridge

Chas. E. Griffin

INVENTOR

Francis Meisel

per P. E. Teschemacher

Atty

N. PETERS, Photo-Lithographer, Washington, D. C.

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Fig 3

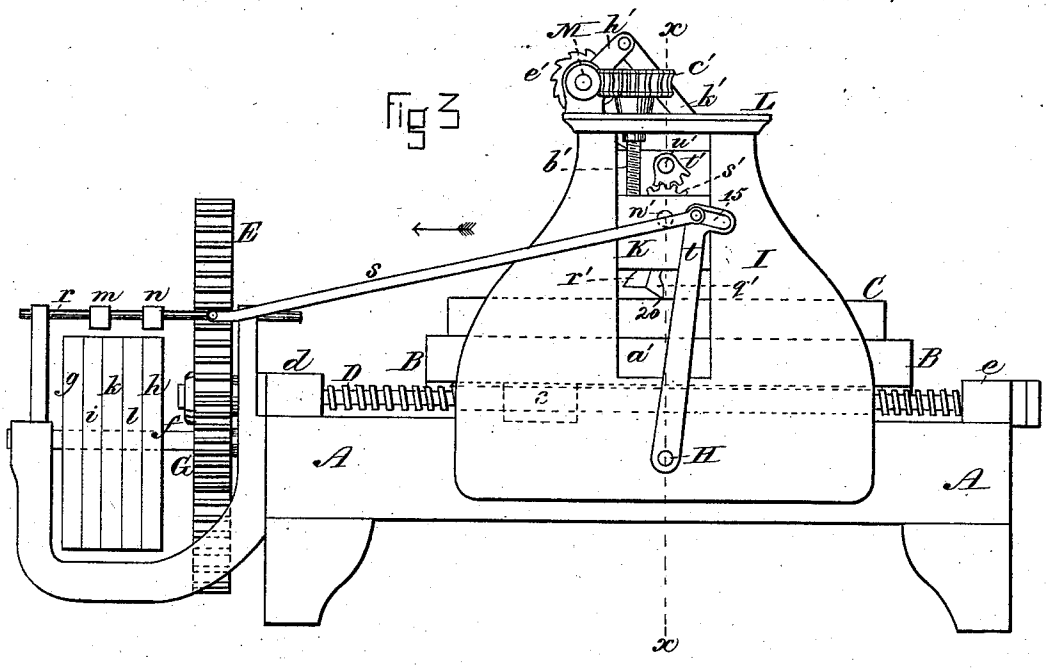
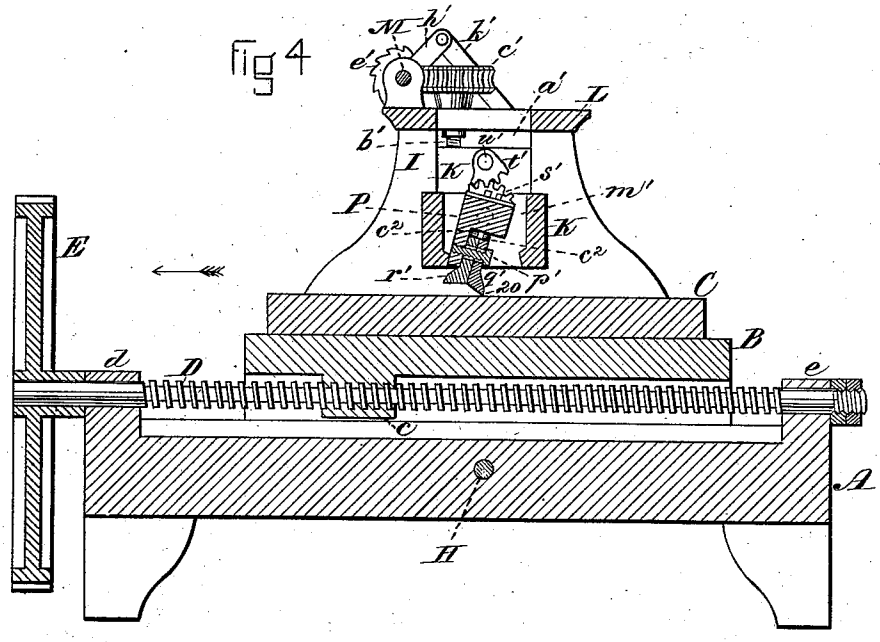


Fig 4



WITNESSES

W. J. Cambridge

Chas. E. Griffin

INVENTOR

Francis Meisel

per P. E. Teschemacher

Atty

N. PETERS. Photo-Lithographer. Washington, D. C.

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Fig 5

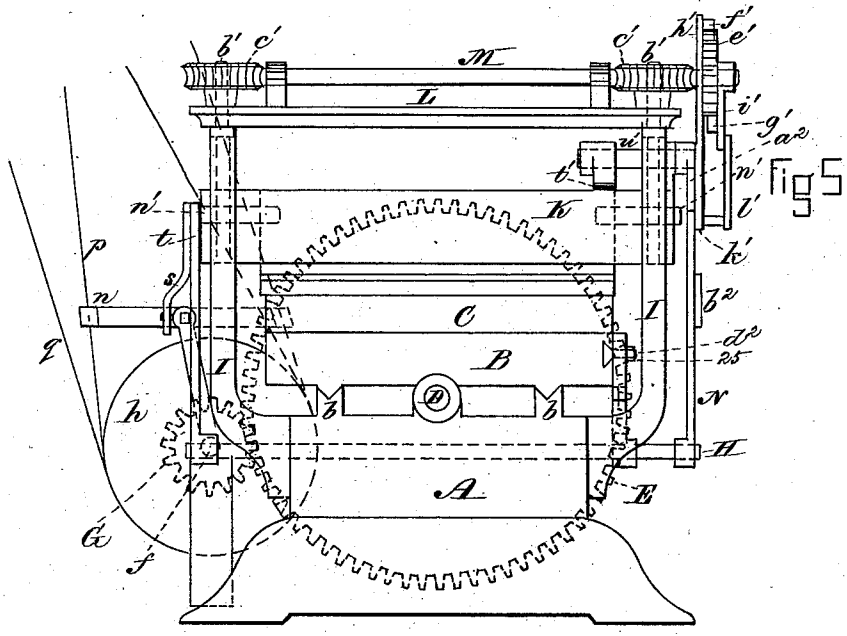


Fig 7

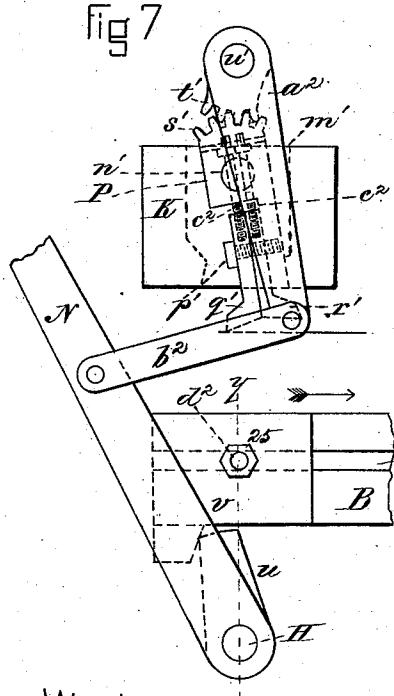
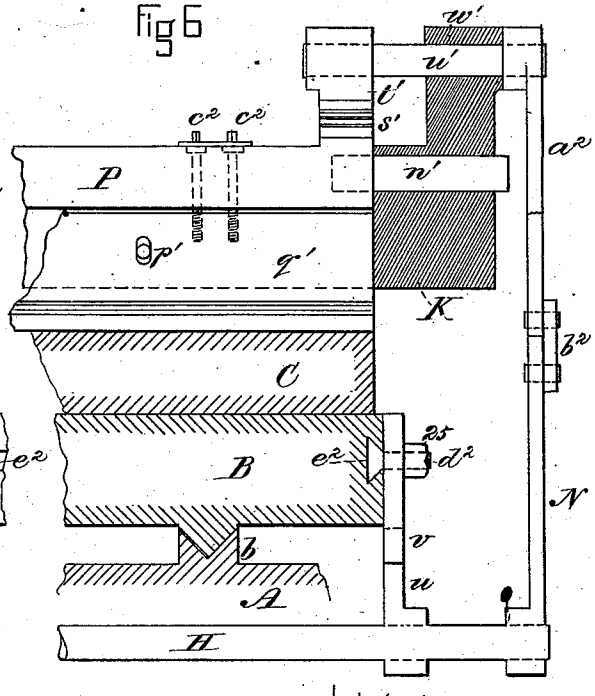


Fig 6



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W. J. Cambridge

Chas. E. Griffin

INVENTOR

Francis Meisel

per P. E. Teschemacher

Atty

N. PETERS, Photo-Lithographer, Washington, D. C.

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Fig 8

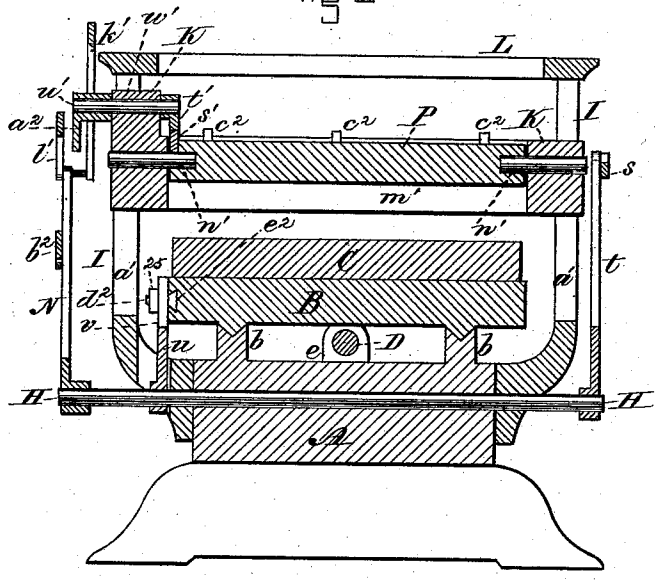


Fig 9

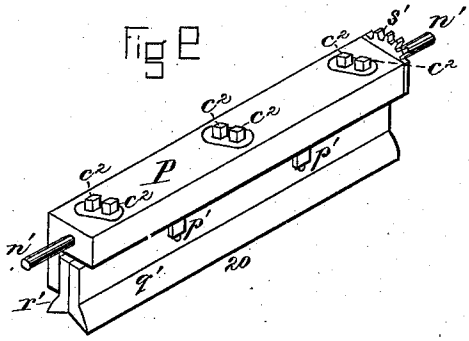


Fig 10

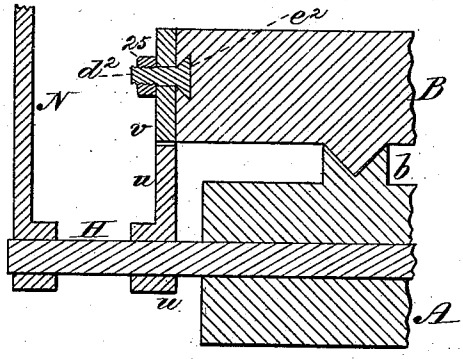
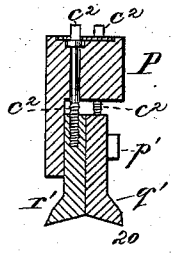


Fig 11



WITNESSES

W. J. Cambridge

Chas. E. Griffin

INVENTOR

Francis Meisel

per F. B. Teschemacher

Atty

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

FRANCIS MEISEL, OF BOSTON, MASSACHUSETTS.

MACHINE FOR DRESSING STONES.

SPECIFICATION forming part of Letters Patent No. 294,401, dated March 4, 1884.

Application filed May 29, 1883. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS MEISEL, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Machines for Planing Lithographic and other Soft Stone, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is an elevation of one side of my improved stone-planing machine. Fig. 2 is a plan of the same. Fig. 3 is an elevation of the side of the same opposite to that represented in Fig. 1. Fig. 4 is a longitudinal vertical section through the center of the same. Fig. 5 is an end elevation of the same; Figs. 6 and 7, sectional details. Fig. 8 is a transverse vertical section through the machine on the line *x x* of Fig. 3. Fig. 9 is a perspective view of the cutter-stock and cutters. Fig. 10 is a section on the line *y y* of Fig. 7. Fig. 11 is a transverse vertical section (enlarged) through the cutter-stock and cutters.

My invention relates to certain improvements in machines for planing or dressing the surface of lithographic and other soft stone. The method now most commonly employed for dressing lithographic stones after use, in order to remove the designs drawn thereon in ink, and give them a smooth and level surface, ready for new work, consists in rubbing another stone over the surface, with fine sand and water between the two. This operation is, however, slow and tedious, and requires great skill to render the surface perfectly level and uniform, as is necessary, especially when the stones are to be used in large cylinder-presses. Machines have been also employed for this purpose, in which a revolving metallic disk was used for grinding down and polishing the surface of the stone, and a knife or scraper has also been employed in connection with a reciprocating carriage for supporting the stone, the scraper acting upon its surface during its movement in one direction only. None of these machines have, however, accomplished the desired end in a sufficiently rapid and perfect manner to warrant their general use.

To facilitate the operation of dressing the stone, and to enable the work to be performed much more rapidly, and at the same time obtain a perfect uniform level over the entire surface of the stone, and also to obtain stones of exactly the same thickness, is the object of my invention, which consists in a stone-planing machine having a pair of cutters or scraping-knives adapted to be rocked or vibrated to bring them alternately into contact with the stone as it is traversed in opposite directions by means of a reciprocating carriage, the shifting of the cutters taking place just previous to the arrival of the stone at the end of its traverse in either direction; and my invention also consists in certain details of construction, as hereinafter set forth and specifically claimed.

In the said drawings, A represents the bed or frame-work of the machine, which is provided with guideways *b b*, on which slides a carriage, B, upon which is secured, by any suitable device, the lithographic or other soft stone, C, to be planed. This carriage has secured to its under side a heavy lug or projection, *c*, through a threaded aperture in which passes a long horizontal screw-shaft, D, which is supported in suitable bearings, *d e*, secured to the bed A between the ways *b b*.

To one end of the shaft D is secured a large gear, E, which is driven by a smaller gear or pinion, G, on a short shaft, *f*, upon which are mounted two driving or fast pulleys, *g h*, between which are arranged three pulleys, *i k l*, running loosely upon the said shaft *f*.

m n are the belt-shippers, by means of which the belts *p q* are alternately shifted from the fast to the loose pulleys, and vice versa, to cause the screw-shaft to be rotated in opposite directions, whereby the carriage is traversed backward and forward from one end of the bed A to the other. The central loose pulley, *k*, onto which each of the belts lap when shifted from its fast pulley, serves to prevent one belt from being moved onto a fast pulley until the other belt has nearly or entirely cleared the other fast pulley. The belt-shippers *m n* are secured to a sliding bar, *r*, to which is pivoted a connecting-rod, *s*, the opposite end of which is provided with a stud which works in a slot, 15, at the upper end of a lever, *t*, secured to one

end of a rock-shaft, H, having its bearings in the frame-work, and extending transversely through the same from one side to the other, the shaft H being provided near its opposite end with a lever, *u*, which is alternately vibrated in opposite directions by adjustable projections *v w* at the opposite ends of the carriage B, and thus, through the connections described, the belts *p q* are shifted and the motion of the screw-shaft D reversed as soon as the carriage has arrived at the end of its traverse in either direction.

On each side of the frame-work A is bolted a heavy standard, I, and between these standards is placed a cross-head, K, the ends of which fit within vertical slots *a'* in the standards. This cross-head K, which carries the cutters or scraping-knives to be hereinafter described, is supported at its opposite ends by two vertical screw-shafts, *b'*, which pass through the cap-piece L, secured to the upper ends of the standards. These screw-shafts *b'* are provided at their upper ends with worm-gears *c'*, which are rotated by worms *d'* on a horizontal shaft, M, having its bearings in projections rising from the cap-piece L. The shaft M is provided at one end with a ratchet-wheel, *e'*, which is rotated in the same direction alternately by the pawls *f' g'*, pivoted to levers *h' i'*, oscillating freely upon the shaft M, and arranged upon opposite sides of the ratchet-wheel. These levers are connected by rods *k' l'* with the upper end of a lever, N, secured to the end of the rock-shaft H, the vibration of which at the end of each traverse of the carriage B, by the contact of one of the projections *v w*, with the lever *u*, as previously described, thus causing the rotation of the ratchet-wheel *e'* and screw-shafts *b'*, and the downward feed of the cross-head K and cutters attached thereto, the arrangement of the pawls upon opposite sides of the ratchet-wheel causing one to engage with its teeth when the lever N is rocked in one direction, and the other to engage with the teeth when the lever is rocked in the opposite direction, whereby a movement of the feed mechanism of the cutters is produced at the end of each traverse of the carriage.

Within a long slot, *m'*, in the cross-head K is hung on pivots *n'* the rocking cutter stock or holder P, to which are secured, by bolts *p'*, the scraping knives or cutters *q' r'*, which act upon the surface of the stone and plane its surface as required. The cutters are shaped at their lower ends as seen in Figs. 3, 4, 7, and 9, and are arranged back to back, so that when the stock P is inclined to one side in the slot *m'* the cutting-edge 20 of the knife *q'* will be in a position to act upon and scrape the surface of the stone C while traveling in the direction of the arrow, the edge of the other knife, *r'*, being raised out of contact with the stone, while when the stock P is thrown over in the opposite direction the cutting-edge of the knife *r'* will be brought into contact with the stone, ready to scrape or plane the same while traveling in a direction contrary to the arrow, the knife *q'* being then raised out of contact with the stone; and by this construction it will be seen that the stone is planed at each traverse of the carriage, thus avoiding much loss of time and effecting a material saving in the cost of dressing or preparing the surface of lithographic and other soft stones.

The oscillation of the cutter-stock P is effected in the following manner: To one end of the stock is secured a toothed segment, *s'*, which engages with a similar segment, *t'*, secured to one end of a short shaft, *u'*, supported in a bearing, *w'*, in one end of the cross-head K. The opposite end of the shaft *u'* has secured to it a lever, a^2, the lower end of which is connected by a rod, b^2, with the lever N, so that as the latter is rocked the cutters are shifted, the movement of the cutters taking place just previous to the arrival of the stone C at the end of its traverse in either direction, and at the same instant that the cutters are shifted the downward feed of the cross-head with the cutter-stock is produced, to cause the next cutter to be lowered sufficiently to shave off a fresh portion of the surface of the stone. The slot 15 at the upper end of the lever *t* affords the necessary amount of lost motion to prevent the belts from being shifted until the lever N has nearly completed its movement in either direction, as is necessary to insure the cutters being oscillated for the succeeding cut before the belts are shifted to cause the stone to travel in the opposite direction.

The cutters are made adjustable vertically in the stock P by means of screws c^2, any suitable number of which may be employed at different portions of the length of the cutters. By means of these screws, which pass through the upper portion of the stock into the cutters, the latter can be adjusted to a perfect level transversely with the carriage B, on which the stone rests, and exactly on a level with each other, in order to insure a cut of uniform depth at each traverse of the carriage, and a uniform action over all portions of the surface of the stone, which is thus given a uniform level surface, as required to produce perfect work.

The projections *v w* are made adjustable in the direction of the length of the frame-work by means of nuts 25 and bolts d^2, the heads of the latter being adapted to slide in a dovetailed groove, e^2, in the side of the carriage B, and by means of this adjustment the rocking of the shaft H can be effected at any desired part of the traverse of the carriage B to reverse the direction of its motion when the end of the stone is reached by the cutter, the point where the reversal occurs depending upon the length of the stone upon the carriage.

When it is desired to raise the cross-head K with its cutters to accommodate stones of varying thicknesses, or for any other purpose,

it is merely necessary to disconnect the pawls f' g' from the ratchet-wheel e', when the shaft M can be turned by means of a crank handle or wheel applied to one end, and the cutters thus raised to the desired height.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a stone-planing machine, the combination, with the reciprocating carriage B, for supporting the stone to be planed, of the oscillating cutter-stock P, pivoted to the cross-head K, and provided with a pair of cutters, q' r', adapted to be alternately brought into contact with the stone at opposite ends of its traverse, the toothed segments s' t', shaft u', lever a^2, rod b^2, lever N, and means, substantially as described, for oscillating the said lever N at each traverse of the carriage, all constructed to operate substantially in the manner and for the purpose described.

2. In a stone-planing machine, the combination, with the vertically-movable cross-head K, sliding in slots in the standards I, and provided with an oscillating cutter-stock, P, having a pair of cutters, q' r', adapted to be alternately brought into contact with the stone at opposite ends of its traverse, of the screw-shafts b', adapted to support the cross-head, and provided at their upper ends with worm-gears c', rotated by worms d' on the horizontal shaft M, located above the cap-piece L, the ratchet-wheel e' on the shaft M, rotated by the pawls f' g' on the levers h' i', oscillating upon the shaft M, and connected by rods k' l', with the lever N on the rock-shaft H, the lever u on the said shaft H, and the projections v w on the carriage B, adapted to vibrate the lever u alternately in opposite directions, all constructed and arranged to operate substantially in the manner and for the purpose described.

3. In a stone-planing machine, the combination, with a rocking cutter-stock, P, supported within the cross-head K, of the two cutters q' r', extending transversely across the entire width of the carriage B, and each made adjustable vertically at different portions of its length by means of screws c^2, whereby each cutter can be adjusted to a perfect level transversely with the carriage, substantially as set forth.

4. In a stone-planing machine, the combination of the reciprocating carriage B, the oscillating cutter-stock P, pivoted to the cross-head K, and provided with the cutters q' r', means, substantially as described, for oscillating the cutters, the shaft H, connected with the mechanism for oscillating the cutters, and operated by the projections v w on the carriage B, the lever t, secured to the shaft H, and provided with a slot, 15, the connecting-rod s, bar r, sliding in standards above the pulleys g and h', and belt-shippers m n, secured to the sliding bar r, all constructed and arranged to operate substantially in the manner and for the purpose described.

Witness my hand this 24th day of May, A. D. 1883.

FRANCIS MEISEL.

In presence of—
P. E. TESCHEMACHER,
JAMES C. SHOUP.