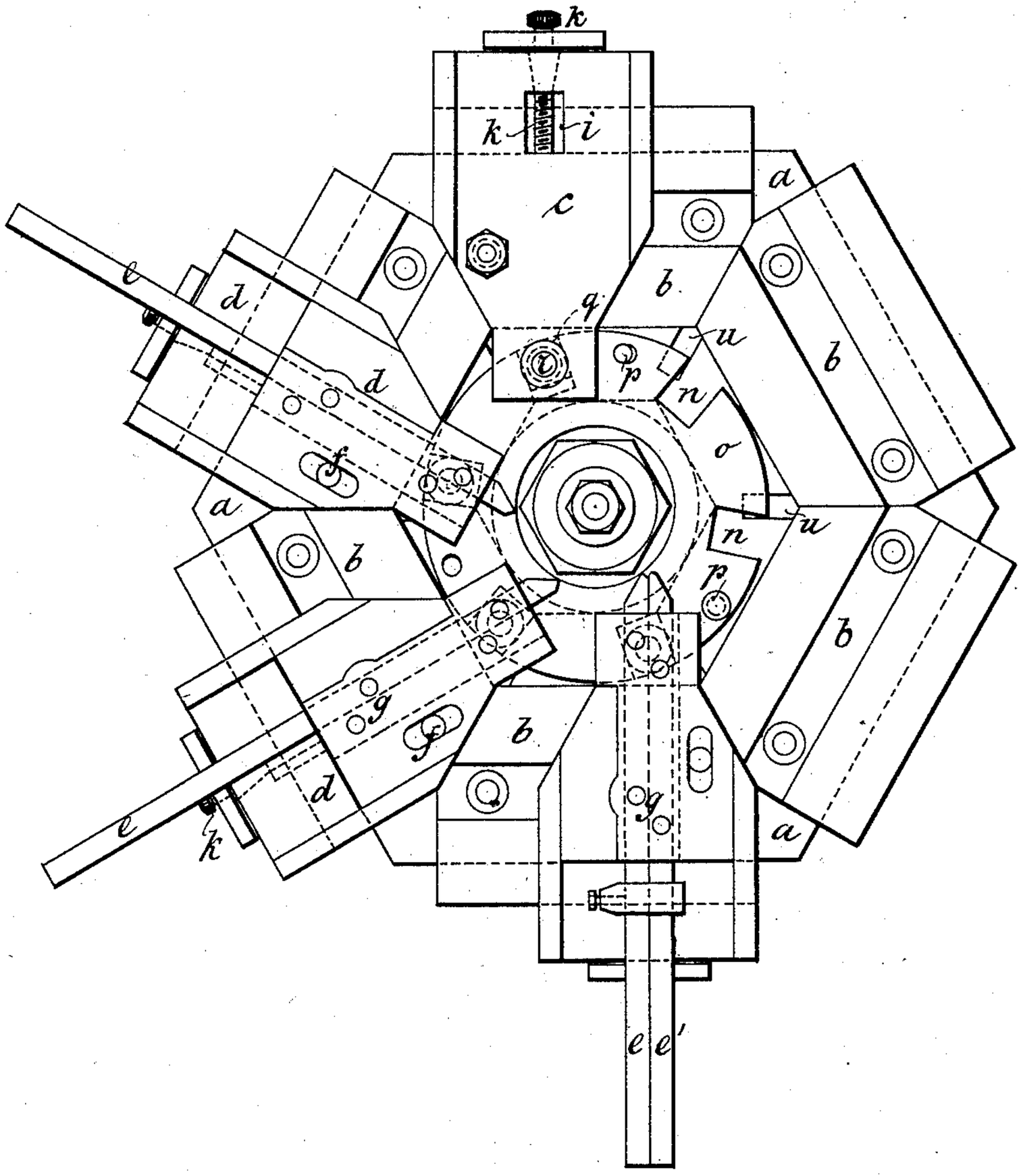
(No Model.) 5 Sheets—Sheet 1.

T. BAUM.

MACHINE FOR DRESSING THE SURFACES OF METAL ARTICLES.

No. 362,054. Patented May 3, 1887.

FIG. 1.



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(No Model.) 5 Sheets—Sheet 2.

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FIG. 2.

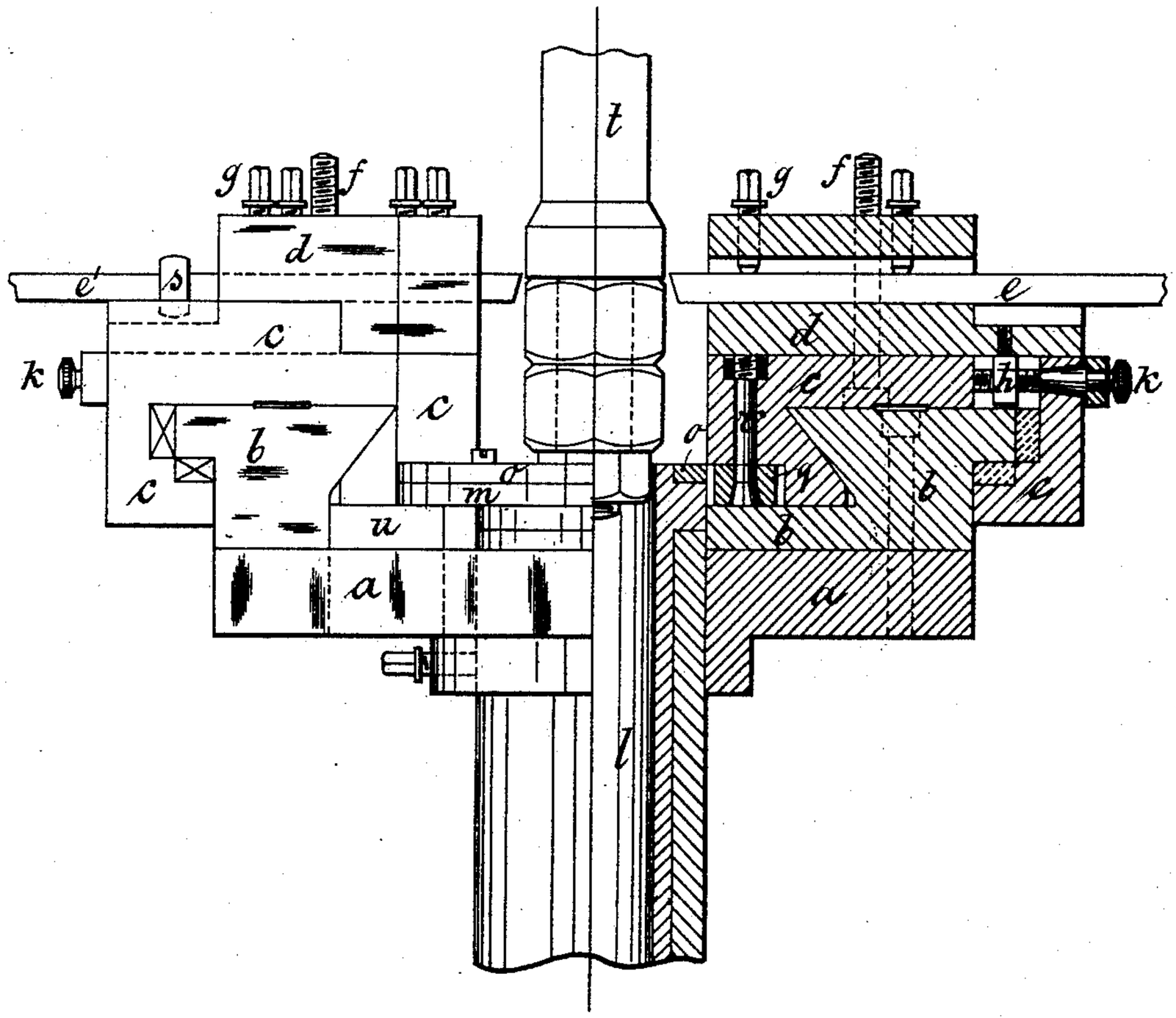
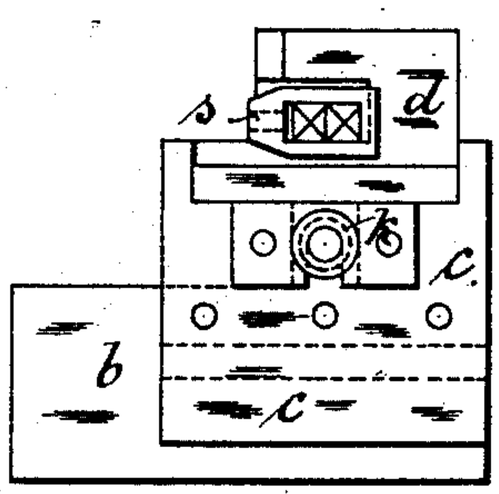


FIG. 3.



Witnesses.
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(No Model.) 5 Sheets—Sheet 3.

T. BAUM.

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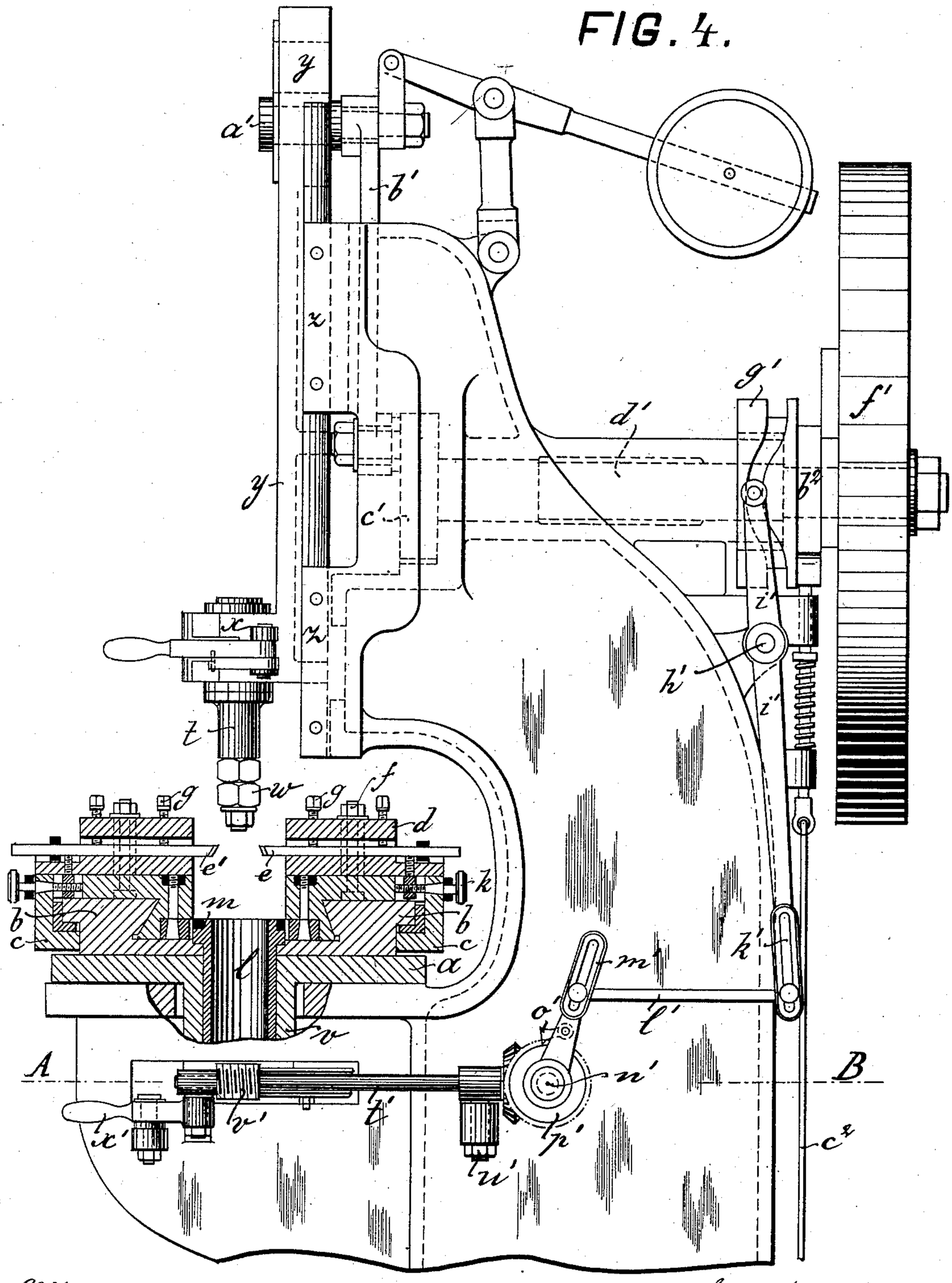
FIG. 4.



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(No Model.) 5 Sheets—Sheet 4.

T. BAUM.

MACHINE FOR DRESSING THE SURFACES OF METAL ARTICLES.

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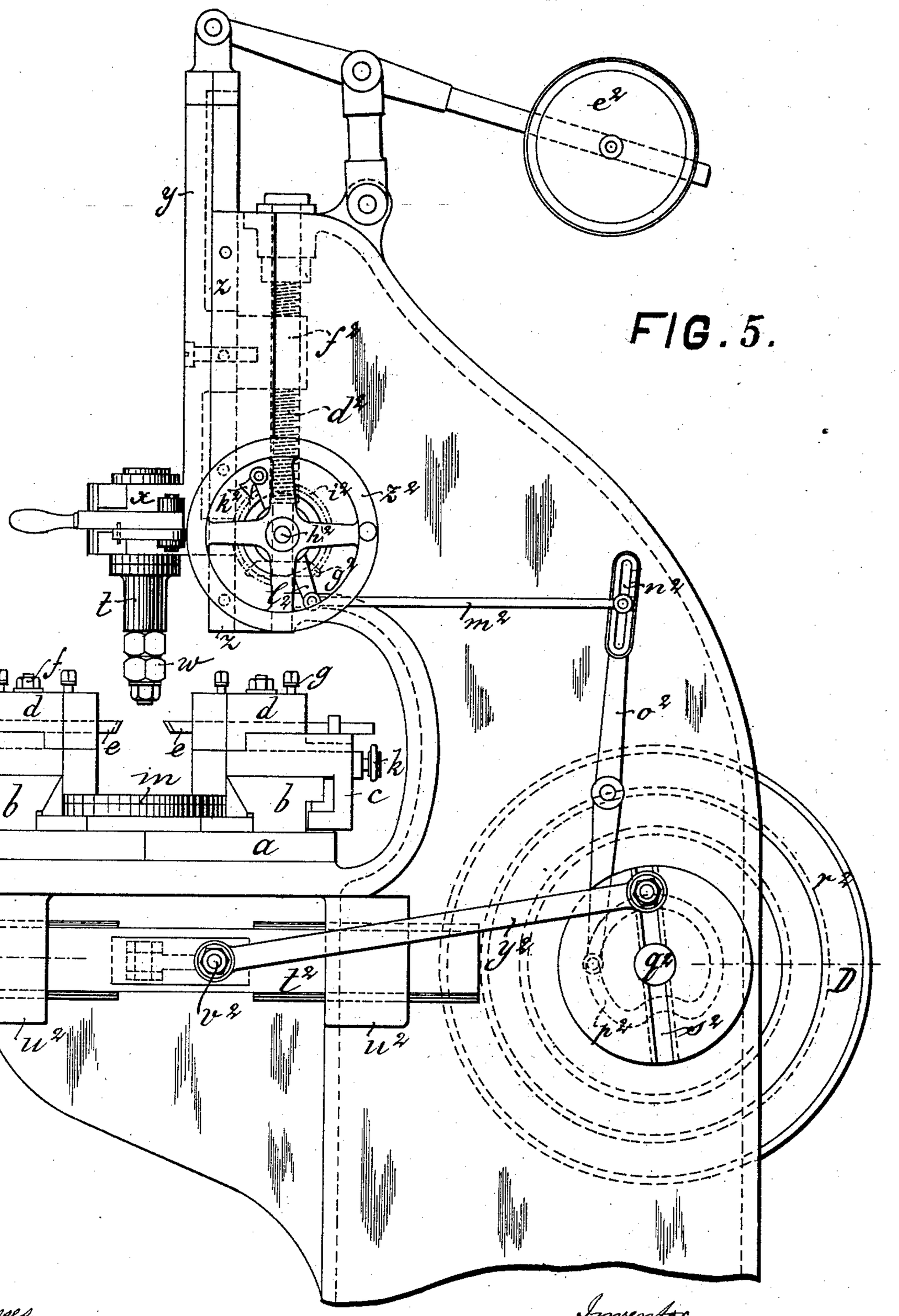

FIG. 5.

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FIG. 6.

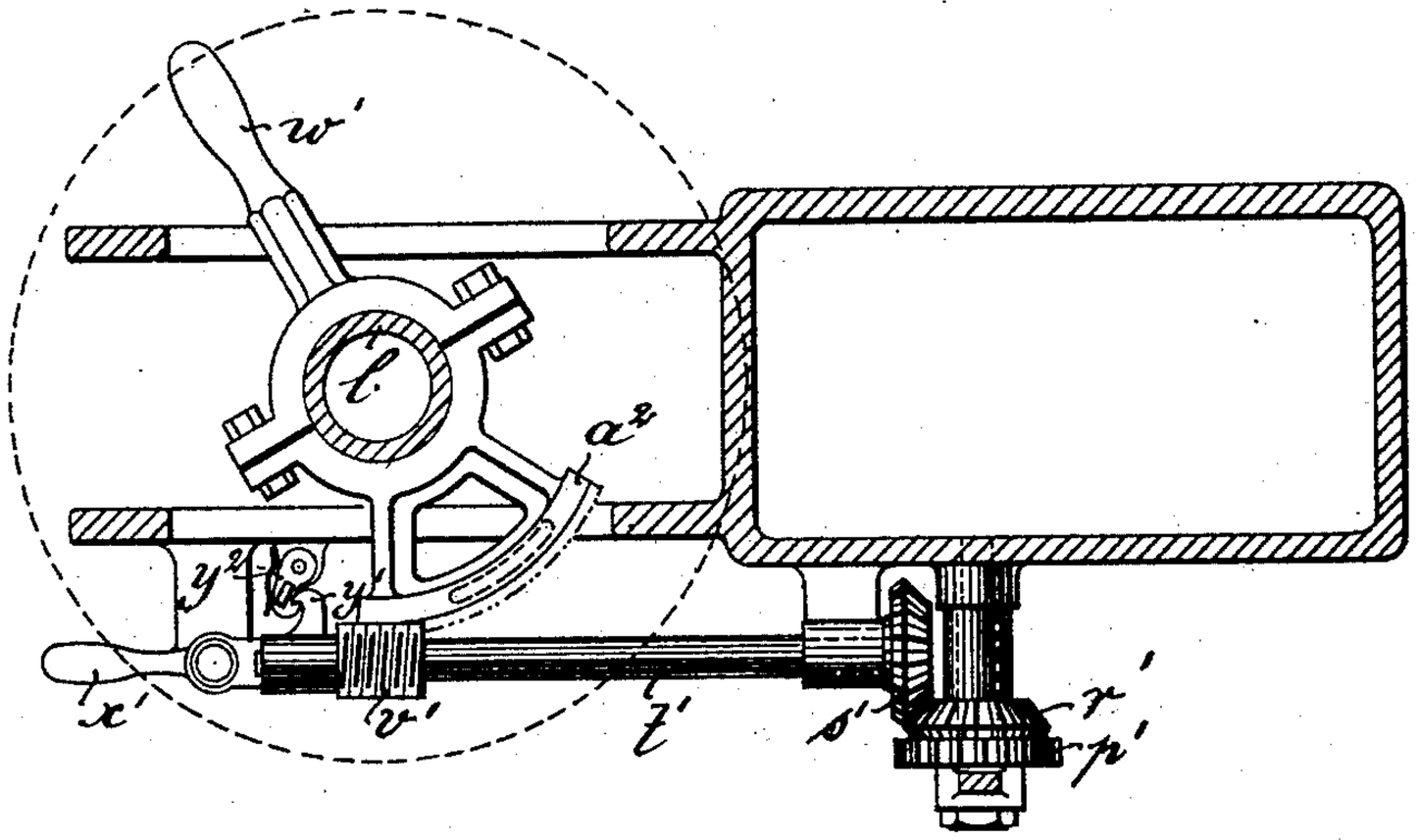
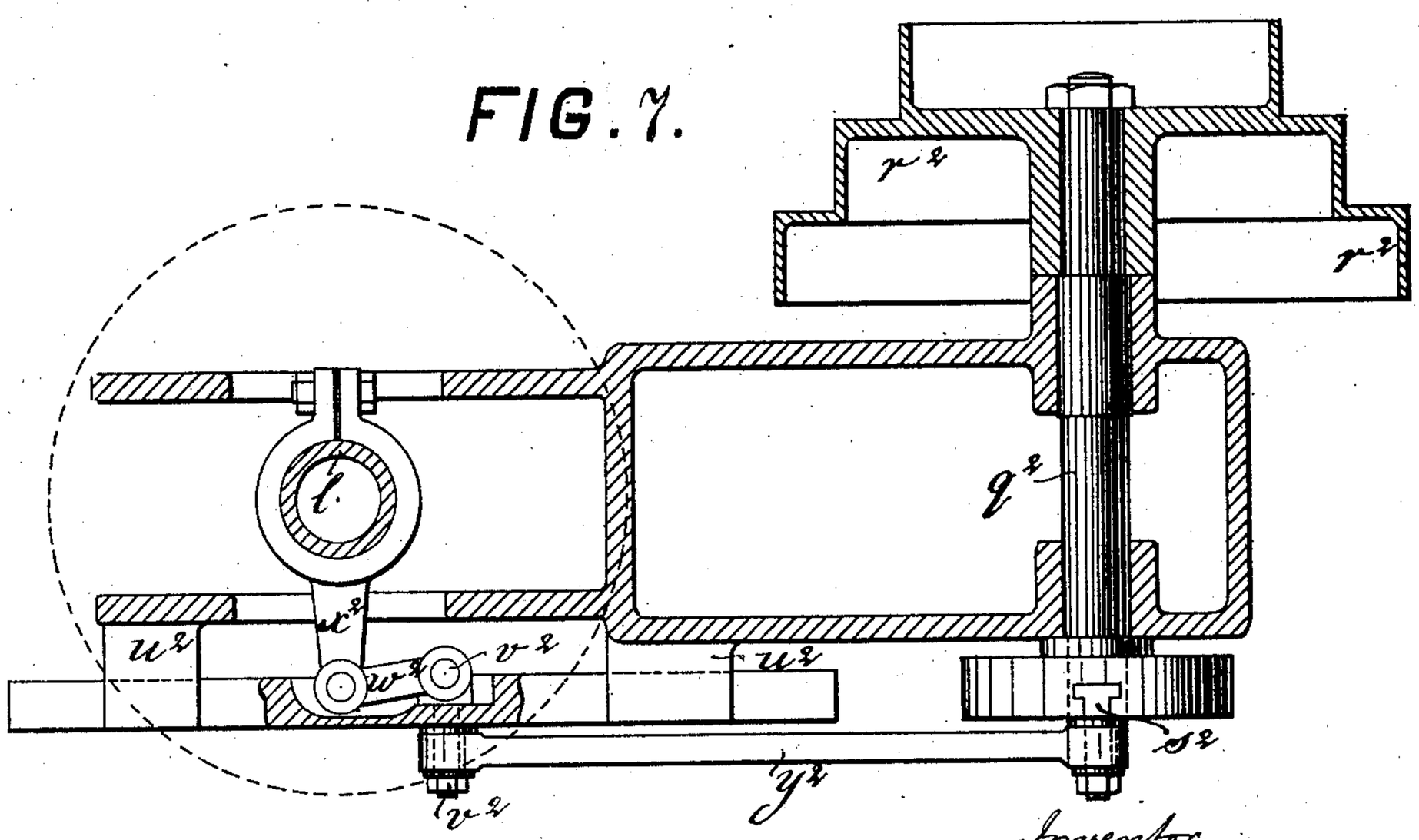


FIG. 7.



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UNITED STATES PATENT OFFICE.

THEODOR BAUM, OF BERLIN, GERMANY.

MACHINE FOR DRESSING THE SURFACES OF METAL ARTICLES.

SPECIFICATION forming part of Letters Patent No. 362,054, dated May 3, 1887.

Application filed November 16, 1885. Serial No. 182,960. (No model.) Patented in Germany October 5, 1885, No. 36,621; in Austria-Hungary October 10, 1885, No. 37,153 and No. 16,297; in Sweden October 24, 1885, No. 523; in England October 28, 1885, No. 12,952; in Belgium October 31, 1885, No. 70,686; in France October 31, 1885, No. 171,980, and in Canada December 3, 1885, No. 23,261.

To all whom it may concern:

Be it known that I, THEODOR BAUM, of the city of Berlin, in the Kingdom of Prussia and German Empire, have invented certain new and useful Improvements in Machines for Simultaneously Operating on or Treating Several Surfaces in Horizontal and Vertical Direction, of which the following is a specification.

My invention relates to a new machine by means of which several surfaces of regular prismatical bodies—such as screw-nuts, bolts, fittings, as well as cocks, water-gages, &c.—may simultaneously be operated upon, both in a horizontal as well as vertical direction; and it consists more particularly in the employment of a number of cutter-holders, which operate together in an exact and accurate manner and can simultaneously be put into operation.

The chief advantage which this machine has over all other existing machines is based upon the application as vertical and horizontal planing or shaping machine in which several objects—such as screw-nuts, for instance—can be simultaneously operated upon, whereby the mechanism effecting the planing in a horizontal direction may also be arranged, together with those parts effecting the planing in a vertical direction, while one or the other of these parts may be put out of function, according to the kind of work which the machine may be required to do. Separate machines, however, may be employed for either of these two kinds of work, so that one machine will only do one kind of work, without departing from the tenor of my invention, as with any new construction any desired mechanism for imparting motive power may be employed.

In the accompanying drawings my invention is represented in a machine for planing in a horizontal and in a vertical direction, but not combined with each other, in order to better illustrate the operation of the parts.

Figure 1 represents a top view of a machine for planing hexagonal screw-nuts, in which, for the better understanding, parts of the cutter-holders are removed. Fig. 2 is a side view and a partial cross-section. Fig. 3 is the front view of one of the tool-supports of the machine. Fig. 4 is a side view of a vertical planing machine, the cutter-holders and their parts being shown in section. Fig. 5 is a side view of a horizontal planing machine, the supports of which are shown in elevation. Fig. 6 is a horizontal section of Fig. 4 on the line A B, and Fig. 7 is a horizontal section of Fig. 5 on the line C D.

The supports *b*, with wedge-shaped grooves, are screwed onto the hexagonal base-plate *a*, which said supports or standards carry the slides *c*, and can be adjusted in lateral direction. These slides carry the cutter or tool holders *d*, which, with their cutters *e*, can be adjusted in a central direction, and are fixed or kept in position by a screw, *f*, the nut of which is omitted in the drawings. The cutters *e* are screwed or fixed in the cutter-holders by pressure-screws *g*, while the adjustment of said cutters in the slide *c* is effected by a piece of metal, *h*, screwed to the front lug of the cutter-holder, which said piece *h* catches into a slot, *i*, of the slide, and is operated by a screw, *k*, which is arranged in the slide *c*.

A tube, *l*, is arranged in the base-plate *a*, and carries at its upper end a disk, *m*, provided with a number of recesses, *n*, corresponding with the number of cutter-holders. A second disk, *o*, with the same number of corresponding recesses, is arranged above the disk *m*, and is capable of being adjusted by means of the screw *p*, or, if the same should be worn out, can be readily replaced by a new disk. In order to obtain an exact movement of the slides *c*, a perforated sliding cube or other suitable piece of metal, *q*, is inserted in each of these recesses, and is fastened to the slide by means of the screw *r*. All these parts rest upon the base-plate *a*, and in an externally-arranged tube, *v*, which can be formed of one piece with the base-plate *a*, as shown in Fig. 4, the whole being arranged in a frame, which may also carry the mechanism for imparting the necessary motive power.

The object or objects operated on—in this case the screw-nuts *w*—are screwed onto the mandrel *t*, which latter is secured to the holder *x* by a clamping-lever in the usual manner. This holder is arranged at the lower end of a slide, *y*, which is allowed to move in the grooves

z of the frame, and is held in the upward position by a counter-weight. A pivot, *a'*, is adjustably arranged in the upper end of the slide *y*, to which said pivot a connecting-rod, *b'*, is fixed, which is eccentrically screwed to a disk, *c'*, arranged upon the end of the shaft *d'*. This said shaft carries a fly-wheel, *f'*, which also serves as strap-drum, and by which the machine is set in operation. The said shaft *d'* also carries a cam, *g'*, the groove of which serves to receive the pin or pivot of a two-armed lever, *i'*, which moves around the fulcrum *h'*. An adjustable connecting-rod, *l'*, is arranged in a slot, *k'*, at the lower end of the lever *i'*, and is at its opposite end fixed in a slot of the lever *m'*, which latter is arranged upon the fulcrum *n'*, and carries a pawl, *o'*, which gears with the ratchet-wheel *p'*, and causes the partial rotation of the same. The ratchet-wheel *p'* is rigidly connected to the bevel-wheel *r'*, Fig. 6, which gears into the bevel-wheel *s'*, arranged upon the axis *t'*, carried in the bearing *u'*. A worm or endless screw, *v'*, operating upon a toothed sector, a^2, is also arranged upon the axis *t'*, the said toothed sector a^2 being firmly secured to the inner tube, *l*, by means of a ring or collar, and provided with a handle, *w'*. The end of the shaft *t'* is carried by a lever, *x'*, and is held in position by the two claws *y' y²*, so that the worm or endless screw is kept in gear with the toothed sector a^2.

The operation of planing in a vertical direction is carried out as hereinafter described.

When planing in a vertical direction, two cutters are employed, of which the one cutter, *e*, serves as a gouging-tool, while the second cutter, *e'*, acts as a smoothing chisel or tool. These cutters are first placed in proper position to each other and rigidly fixed by a clamp, *s*, after which they are brought into nearly their required positions in the cutter-holder and fixed in the latter by the screws *g*, while the cutter-holder is accurately adjusted by the set-screws *k* and fixed in the slide by the screw *f*. If the shaft *d'* is caused to rotate, an upward and downward gliding movement is imparted to the slide *y* by means of the connecting-rod *b'* operating eccentrically upon the disk *c'*, so that the object, *w*, operated upon is carried to and fro past the cutters. After every double stroke an intermittent rotating movement of a given extent is imparted to the tube *l* by the action of the cam *g'*, the lever *m'*, and the screw-gear *v' a²*, whereby and by means of the parts *q*, located in the recesses and fastened to the slides *c*, these said slides, and with them the cutter-holders *d*, are moved in a lateral direction to correspond with the breadth of the chip or metal removed or planed from the object treated. When the article operated upon is finished, the claw *y²* is pressed back and the worm *v'* uncoupled by means of the lever *x'*. By simply rotating the tube *l* the whole system of cutter-holders can now be returned to its original position without the necessity of putting the said cutter-holders separately back to the position they assume at the commencement of the operation. A brake-strap, *b*, arranged upon the shaft *d'*, will bring the machine to an immediate stop when the connecting-rod *c* is operated on by a treadle arranged within the frame. The employment of two cutters for planing in a vertical direction also has the advantage that in the event of the breaking of the cutter or gouging-tool *e* an exchange of the same is not necessary, as in such an event the cutter or smoothing-chisel *e'* will continue to do the work until the object is finished.

For planing in a horizontal direction the mechanism for imparting motive power, as shown in Figs. 5 and 7, is employed.

As before described, the mandrel *t* is held fast by the clamp *x* of the slide *y*, which is also kept in a raised position by the counter-weight e^2 and guided in the grooves *z* of the frame. The movements of the slide must now take place in a slow and accurately-regulated manner, which is insured by the employment of a vertical screw-spindle, d^2, which is able to rotate vertically in its bearings in the frame, but is unable to shift from its position.

The screw-nut f^2, fastened to the slide, bears upon the aforementioned spindle, so that when the latter rotates the slide is moved up and down. A bevel-wheel, g^2, is also arranged at the lower end of the screw-spindle, and is in gear with another bevel-wheel arranged upon the axis h^2. A ratchet-wheel, i^2, is fixed to the axis h^2 outside the frame, into which said wheel i^2 the pawl k^2, attached to the double-armed lever l^2, gears. A connecting-rod, m^2, engages with the lever l^2, said connecting-rod being adjustably arranged in the slot n^2 of the two-armed lever o^2, the lower end of which is guided in a cam-groove, p^2, and effects an oscillating movement, by means of which an intermittent rising movement of the slide *y* is effected.

The grooved cam is arranged upon the driving-shaft q^2, which also carries the step-drum r^2. The reverse side of the aforementioned grooved cam is provided with a swallow-tail slot, s^2, in which a rod, y^2, is eccentrically and adjustably secured in suitable manner, which said rod engages with a slide, t^2, gliding in the bearings w^2. An arm, w^2, is attached to the rigid pivot v^2 of the slide t^2, and connected with the arm x^2, which embraces the central tube, *l*, so as to produce an oscillating movement of the tube *l* at each double stroke of the slide t^2.

When planing in a horizontal direction, the operation of the machine is as follows: As before described, the cutter or tool holders are put in their proper positions. The tube *l* imparts a reciprocating movement to the tube *c*, and consequently to the cutter or tool holders, so that the cutters are passed to and fro along the surface of the object under treatment. After every double stroke the stem or mandrel *t* is raised by the screw d^2 a distance equal to the breadth of the parings or cuttings,

which can be accurately regulated. The hand-wheel z^2 serves to secure an accurate adjustment of the object to be treated with regard to its position to the cutters or tools.

In order to remove the parings or cuttings from the interior of the machine during the working of the same, the tool-holders *b* and the base-plate *a* are provided with a number of slots, through which the said parings or cuttings, which also pass out from the machine through the tube *l*, are removed. A vessel with soap-water may be placed in the center of the system of cutter or tool holders for the purpose of cooling and greasing the cutters or tools.

Having now described my said invention and in what manner the same is to be carried into effect, I declare that what I claim is—

In a machine for dressing nuts, &c., the combination, with a vertically-reciprocating mandrel for carrying the material to be operated upon, of a series of slide-rests arranged radially around the mandrel and carrying radially-adjustable cutter-holders and cutters, with mechanism for giving the slide-rests a lateral reciprocating movement, said mechanism consisting of a tubular spindle passing up centrally through the frame of the machine, and carrying a disk at its upper end having a notch in its periphery for each slide-rest, and a block fixed to each slide-rest and engaging said notches, substantially as and for the purpose set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

THEODOR BAUM.

Witnesses:

ANTHONY STEFFEN,

B. ROI.