(No Model.) 3 Sheets—Sheet 1.

B. HOLMES.

MACHINE FOR GRINDING STEEL BARS.

No. 248,744. Patented Oct. 25, 1881

Fig. 1

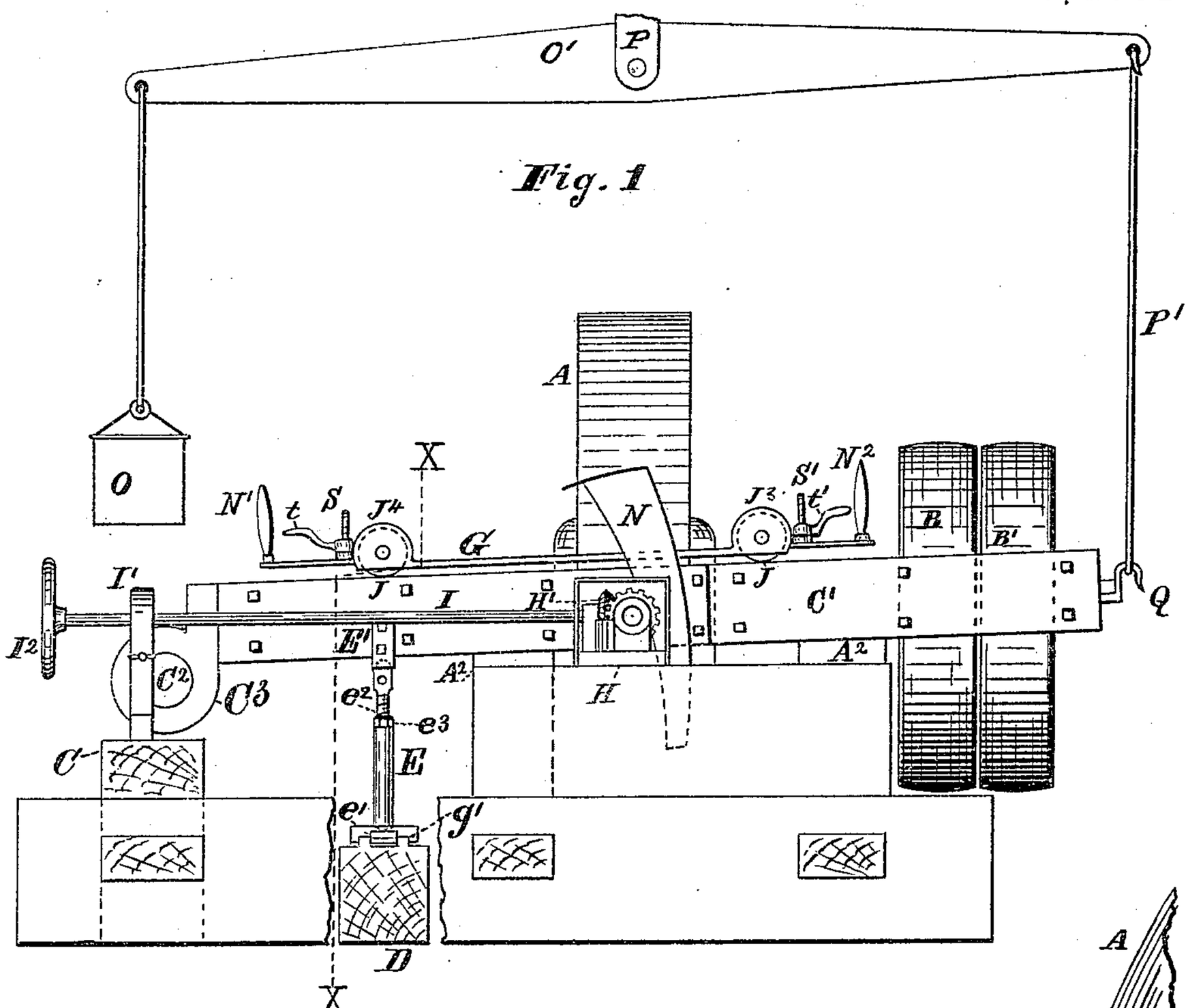
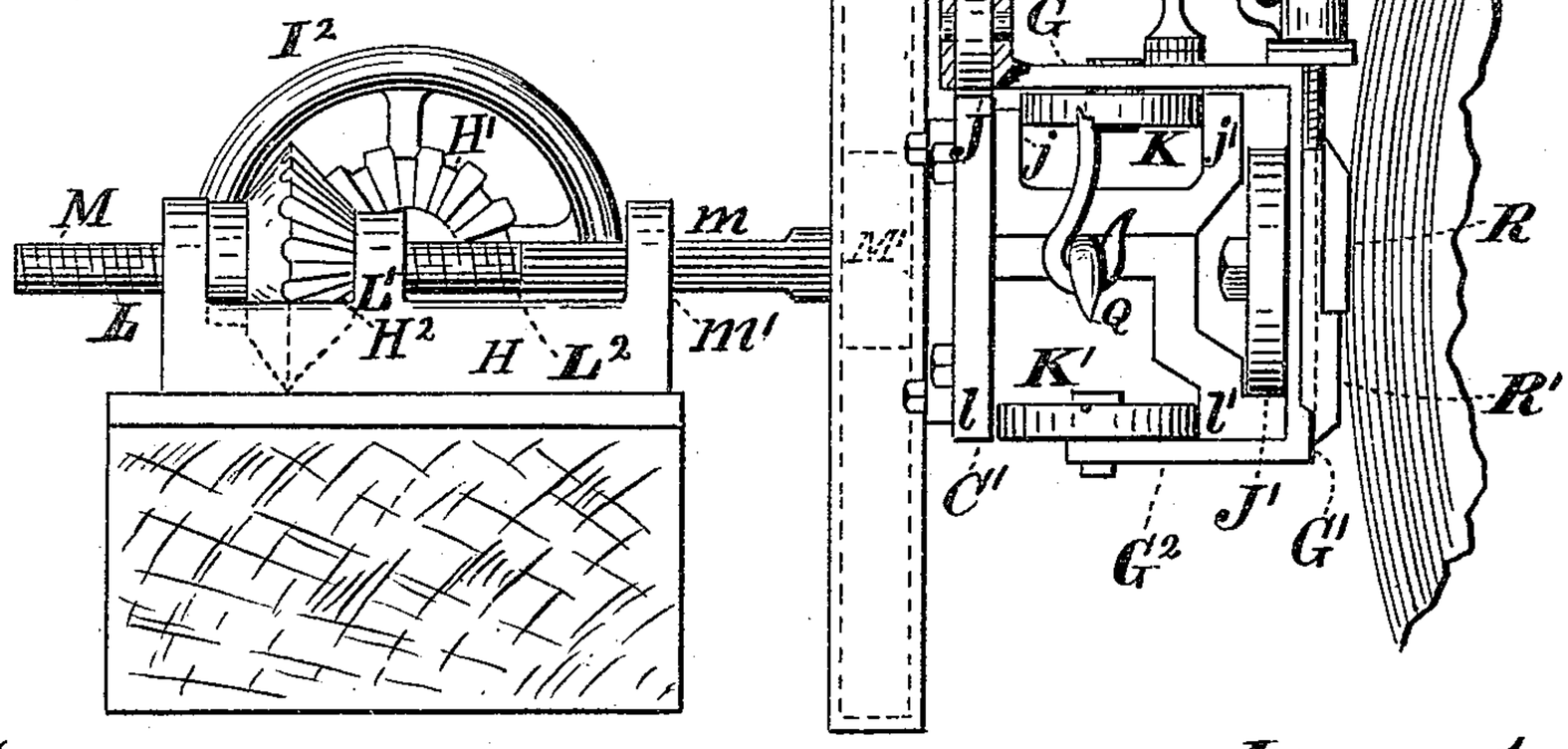


Fig. 2



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(No Model.) 3 Sheets—Sheet 2.

B. HOLMES.

MACHINE FOR GRINDING STEEL BARS.

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Fig. 3

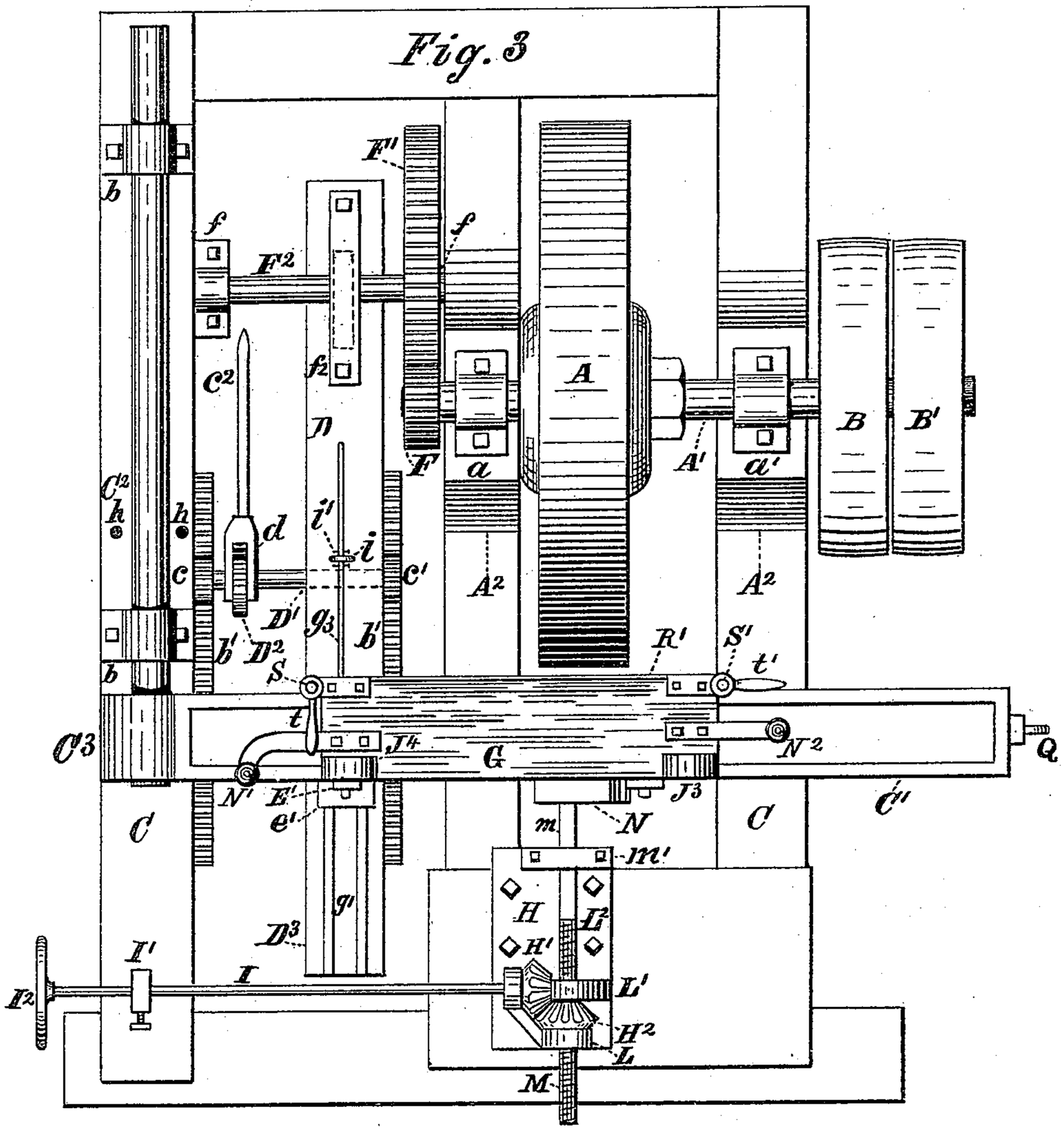
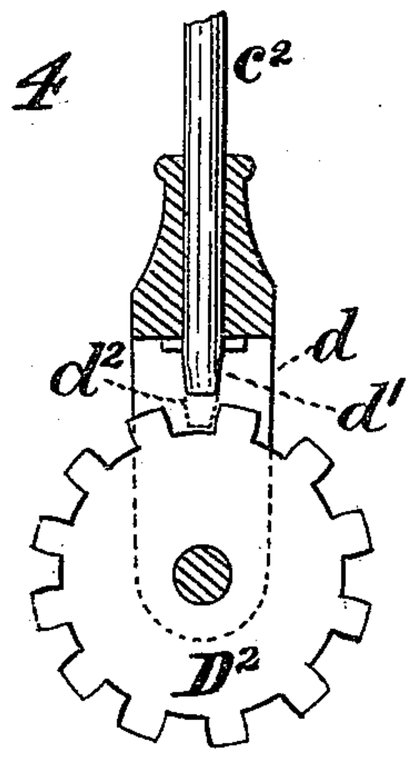


Fig. 4



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(No Model.) 3 Sheets—Sheet 3.

B. HOLMES.

MACHINE FOR GRINDING STEEL BARS.

No. 248,744. Patented Oct. 25, 1881.

Fig. 6

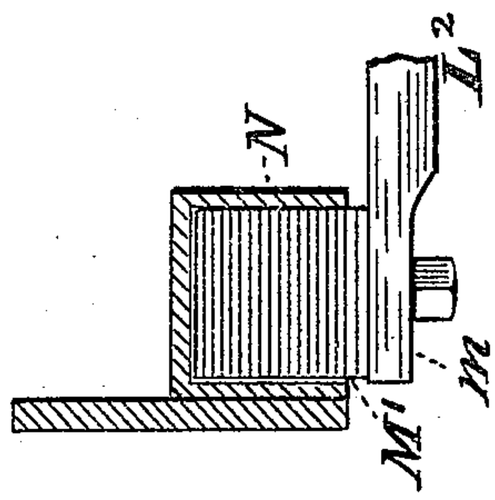
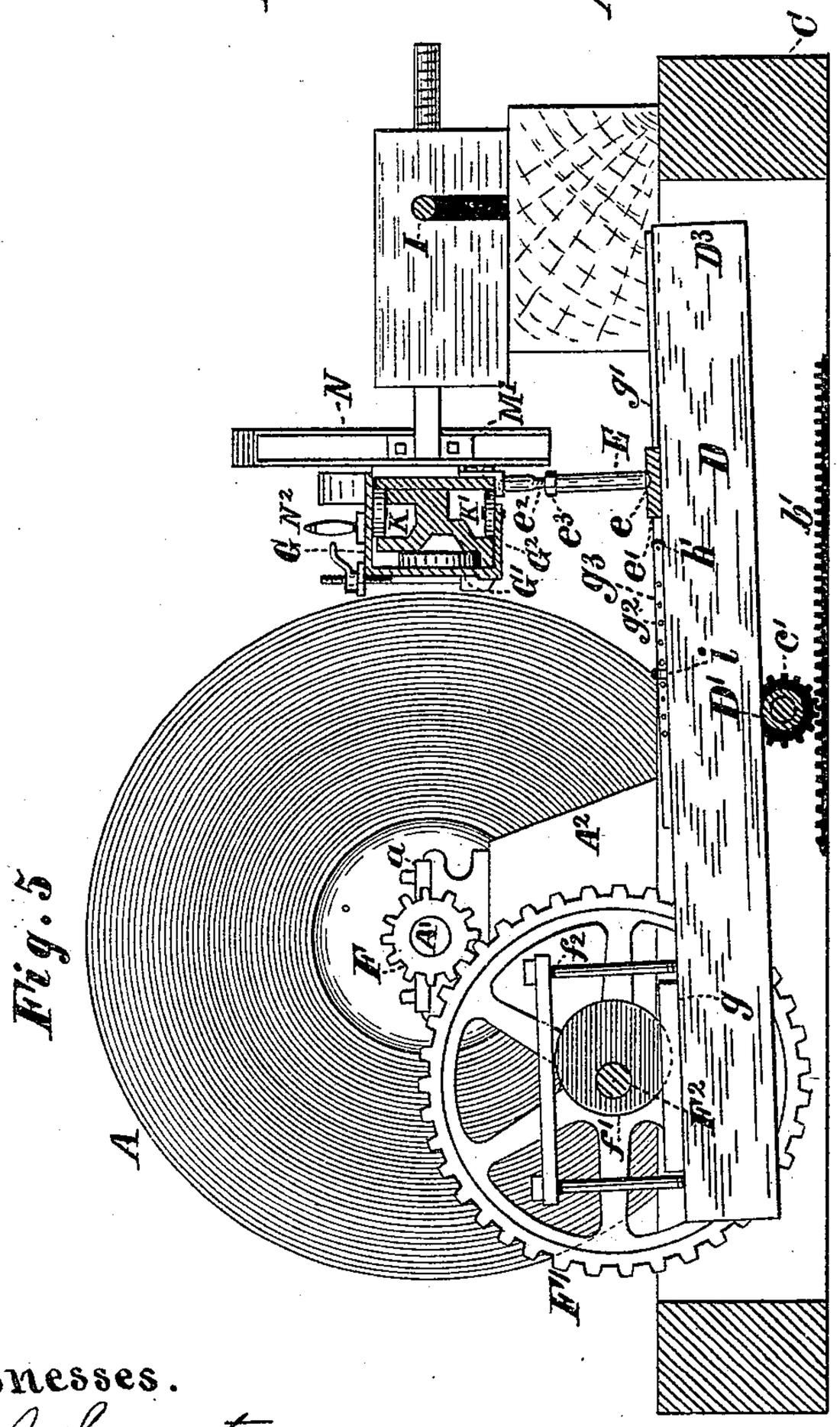


Fig. 5



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UNITED STATES PATENT OFFICE.

BRITAIN HOLMES, OF BUFFALO, NEW YORK, ASSIGNOR TO HIMSELF AND EDWARD HOLMES, OF SAME PLACE.

MACHINE FOR GRINDING STEEL BARS.

SPECIFICATION forming part of Letters Patent No. 248,744, dated October 25, 1881.

Application filed May 7, 1881. (No model.)

To all whom it may concern:

Be it known that I, BRITAIN HOLMES, a citizen of the United States, residing in Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Machines for Grinding or Planing Hard Steel Bars or other articles, of which the following is a specification.

The object of my invention is to produce a machine for grinding a true or plane surface on hardened steel bars, planer-knives, or other articles requiring their sides or other parts to be readily brought to a straight or plane surface; and it consists, first, in the combination of a suitable grindstone, emery, or other wheel with a table having a curved downward and upward movement, and a horizontally-movable table for holding the bar or other article to be ground, the arrangement being such that the combined action of the table having the curved up and down or vibrating movements and the horizontally-movable table allows the article to be ground straight in the direction of its width and also in the direction of its length.

The second part of my invention consists in the combination, with the up and down movable table, of a suitable means, as will be more clearly hereinafter shown, for moving it to or from the grinding-wheel, the said table being connected to a shaft so as to receive its up and down swinging or vibrating movements by means of said shaft as a center to swing on, which shaft is capable of an easy longitudinal adjustment, the object being, first, to provide the means for easily adjusting said table to or from the stone while in operation, according to the thickness of the article to be ground or the thickness it may be desired to grind the article; second, a further means for adjusting the table as the stone wears away.

The third part of my invention relates to the means for adjusting the length of the up and down curved movements of the table, so as to regulate its movements to articles of different widths, all of which will be more clearly understood by reference to the drawings, in which—

Figure 1 is a front elevation of the machine; Fig. 2, an enlarged side elevation of the device for adjusting the distance of the table to or from the grinding-wheel while the same is in operation. Fig. 3 is a plan or top view of the apparatus; Fig. 4, a detached view, showing a side elevation of a portion of the device, partly in section, for adjusting the length of the upward and downward movements of the table. Fig. 5 is a side elevation, partly in section, through line X X, Fig. 1; and Fig. 6 represents a horizontal section through a portion of the device for adjusting the distance of the movable tables to or from the grinding-wheels while the same is in operation.

A represents the grindstone. It is supported by a shaft, A', set on a frame or support, A^2, in boxes *a a'*, in the usual way, and it is provided with the ordinary tight and loose pulleys, B B', for driving it.

C represents the main frame or base, of hard wood or other suitable material. It is put together in the usual way, so as to be strong and secure.

The vibrating or swinging table C' is jointed to the frame C by a strong shaft, C^2, set in boxes *b*, (see Fig. 3,) which shaft C^2 is rigidly fastened to the back end, C^3, of the table C' by a key or other well-known device, and is made long enough and arranged in the boxes *b*, so as to be capable of a longitudinal and also a rocking movement, and thereby afford the means for giving the table C' its necessary movements and adjustments. The table C' receives its up and down swinging curved movements by means of a rocking beam, D, resting on a fulcrum, D', the fulcrum being adjustable back and forth along the racks *b'* (which racks are set upon a foundation made in any well-known way) by means of the pinions *c c'* (see Fig. 3) and the pinion D^2, (see Figs. 3 and 4.) The pinion D^2 is fitted into a suitable holding-piece, *d*, provided with a lever or arm, c^2, and arranged so as to turn easily on the shaft or fulcrum D'. The lever c^2 is made movable longitudinally a sufficient distance to allow its lower end, *d'*, to engage with the teeth in the pinion D^2, as shown by the dotted lines d^2 in Fig. 4, or to be disengaged therefrom by withdrawing it from the teeth in the pinion.

E represents an upright supporting-bar, the

lower end of which rests in a concave or depression, *e*, in the sliding block *e'*. (See Fig. 5.) The upper end is also set in a similar depression in a block, E', secured to or forming a part of the table C', so that the weight of the table keeps it in place. The upper part of the bar E is made adjustable in the direction of its length by means of the screw e^2 and nut e^3, for the purpose of adjusting the height of the table C'.

The beam D receives its oscillating movements from a pinion, F, fastened to the shaft A', and a spur-wheel, F', rigidly secured to the shaft F^2, which shaft is set in suitable bearings, *f*, and provided with an eccentric, *f'*, arranged within a yoke, f^2, on the beam D. The lower portion of the eccentric is set in an oil-pan, *g*. (See Fig. 5.)

It will now be seen that as the pinions *c c'* gear into the racks *b'* the fulcrum or shaft D' may be moved back and forth along the said racks, whereby the length of the oscillating movements of the end D^3 of the beam D and the upward and downward movements of the table C' may be regulated or made greater or less, according to the width of the article to be ground.

The object of the up and down movements of the table C' is to impart the necessary transverse movement to the article to be ground, whereby its whole width is made true.

The mechanism for giving the article to be ground a longitudinal movement, so that it may be made straight in the direction of its length, consists of a table, G, resting upon the table C' upon rollers J J', (see Fig. 2,) where one of the covers J^3 of the upper roller, J, is shown in section, so as to show the roller. The under part of the table G is provided with wheels K, arranged within the ways *j j'*, and to the front plate, G', which forms a part of, or is securely fastened to, the table G, is attached in any well-known way the rollers J', and on the bottom plate, G^2, which is a part of G', or is firmly fastened to it, are two rollers, K', arranged between the ways *l l'*. It will be noticed that both ends of the table G are provided with the above-mentioned wheels or rollers, so that both ends will be supported and held closely to the table C' and yet be capable of a free and easy movement along the same. The upper rollers are covered by covers J^3 J^4. The table G is moved by hand back and forth along the table C', while grinding a bar or other article, by means of the handles N' N^2.

The mechanism for readily moving the table C' to or from the stone while grinding a bar or other similar article, so as to adapt it to articles of different thicknesses and for any slight wearing away of the grinding stone or wheel, is constructed as follows:

H represents an iron frame secured to a block or other support by bolts, so that it may move forward when necessary, and fastened by bolts, or in any well-known way, and is provided with the ordinary bearings for the bevel-gear wheels H' H^2.

To the gear-wheel H' is securely connected a shaft, I, supported at its outer end in an upright bar, I', and provided with a hand-wheel, I^2, for turning it.

The bevel-wheel H^2, which acts as a screw-nut, is inclosed between two vertical supports, L L', which have openings for the bar L^2 to pass through. The front end, *m*, of the bar L^2 is made square or of any other suitable form, and passes through a corresponding opening in the vertical frame-piece *m'*, so as to prevent it from turning therein. The other portion of the bar is made round and provided with a screw-thread, M, which passes through and fits the thread in the nut or bevel-wheel H^2.

To the front end of the bar or shaft L^2 is securely connected a block, M', (see Figs. 5 and 6,) which block is arranged to fit closely and slide in a case, N, which case is securely fastened to the table C' by bolts, and has an open side to receive the said block. In Fig. 5 a back view of the block M' is shown, and a top view in Fig. 6: also a portion of the bar L^2, attached to it. The case N should be in the form of a curve the radius of which would start from the center of the shaft C^2. By this construction it will be seen that by turning the hand-wheel I^2 the bar L^2 will be moved longitudinally, and that, as the frame H is rigidly held to the frame-work below it, and the table C' being connected by a block, M', as before mentioned, the table will be moved to or from the grinding-wheel, according to the direction in which the hand-wheel I^2 may be turned. As the grinding-wheel wears away, so as to be beyond the reach of the movements controlled by the hand-wheel I^2, the table C' is moved toward it by sliding the shaft C^2 forward in the boxes *b*, and if the first box *b* should be in the way it can be moved to the holes *h h*. At the same time the block *e'* should be moved in the same direction along the beam D on the ways *g'*, so as to be vertical, or nearly so, under the table C'. The block *e'* is held in place when so moved by means of a bar, g^3, which passes through a staple, *i*, and is provided with perforations g^2, and when in the desired position it is held in place by two pins, *i'*, which are passed through a perforation, g^2, one on each side of the staple, (see Fig. 3,) thereby holding it securely until the grinding-wheel wears away enough to require a further movement forward.

It will also be noticed that as the table C' is moved toward the grindstone in this way, the frame H and its mechanism, and block on which it rests, should be loosened and moved forward and securely bolted in place.

O (see Fig. 1) represents a counter-weight, suspended to one end of a beam, O', which beam is suspended on any suitable joint, P, near the ceiling, or some other convenient place. The opposite end of the beam is provided with a rod, P', the lower end of which connects with the hook Q on the outer end of the table C'. The object of the weight O is to counterbalance the weight of the table C', so it will work easier.

The bar to be ground—the cutter-bar R, for

instance (shown in Fig. 2)—is placed on the bar R′, which is arranged close to the face of the front of the table G, so as to be moved up or down, when required, by means of the screw-rods S S′ and their handle nuts *t t′*. (See Figs. 1 and 2.) The grinding-wheel holds it with sufficient force in place against the front of the table G′, and, the motion of the stone being in the direction of the arrow, (shown in Fig. 2,) holds it down firmly to the holding-bar R′. During the operation of grinding, the article to be ground is forced up against the grindstone by the hand-wheel I^2, and at the same time the table G is moved back and forth along the table C′ by the handles N′ or N^2.

I claim as my invention—

1. A suitable grinding-wheel, A, supported in the usual bearings, in combination with the table C′, supported in a longitudinally-movable rock-shaft, C^2, and a horizontally-movable table, G, provided with a holding-bar, R′, as and for the purposes specified.

2. The case N, secured to the table C′, the shaft L^2, held from turning in the bearing *m′*, as specified, and provided with a screw, M, in combination with the bevel-wheel H^2, adapted to fit the screw M and arranged between supports L L′, the bevel-wheel H′, shaft I, and hand-wheel I^2, for the purpose of readily moving the tables C′ and G to or from the grinding-wheel, as described.

3. The eccentric *f′*, arranged within a yoke, f^2, on the rocking beam D, the vertical bar E, and table C′, in combination with the movable or adjustable fulcrum D′, for the purpose of operating and adjusting the length of the vertical movements of the table C′, substantially as described.

4. The combination of the table C′, shaft C^2, vertical bar E, sliding block *e′*, bar g^3, staple *i*, and beam D, for the purpose of adjusting the table C′ and its connections as the grinding-wheel wears away, as set forth.

5. The vertically-adjustable holding-bar R′, in combination with the swinging table C′ and horizontally-movable table G, for the purposes specified.

6. The rocking bar D and its operating mechanism, supported on a fulcrum, D′, made adjustable, substantially as specified, the vertical supporting-bar E, and table C′, arranged to swing on a shaft, C^2, horizontally-movable table G, and the case, N, with its operating mechanism, the whole being combined for joint operation, substantially as and for the purposes described.

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Witnesses:
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