(No Model.) 2 Sheets—Sheet 1.

J. C. BUTTERFIELD.

STAMP MILL.

No. 285,388. Patented Sept. 25, 1883.

Fig. 1

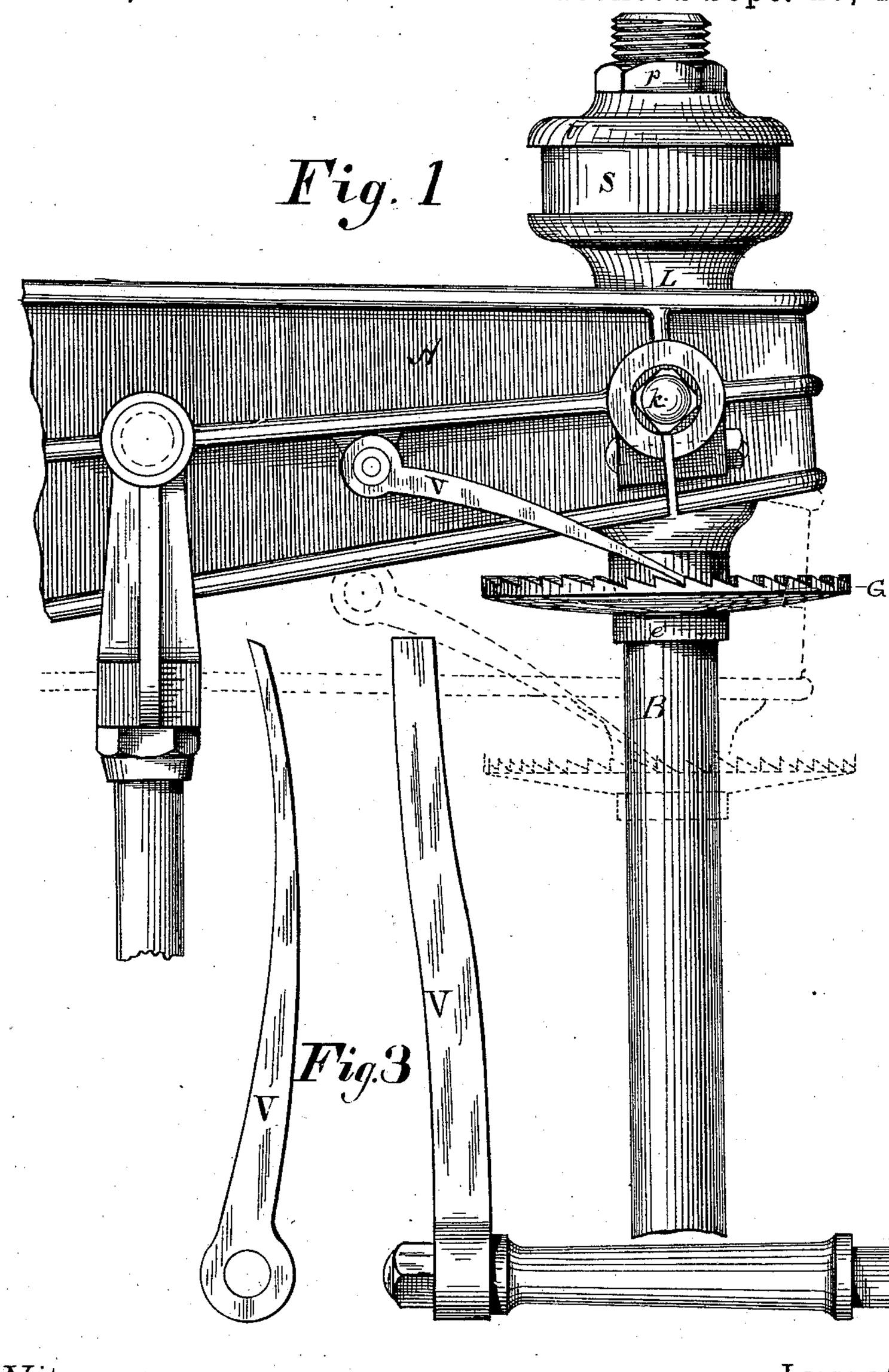

Fig. 3

Witnesses:
J. C. Turner
M. V. Smith

Inventor:
John C. Butterfield
By R. D. O. Smith
his Attorney.

(No Model.) 2 Sheets—Sheet 2.

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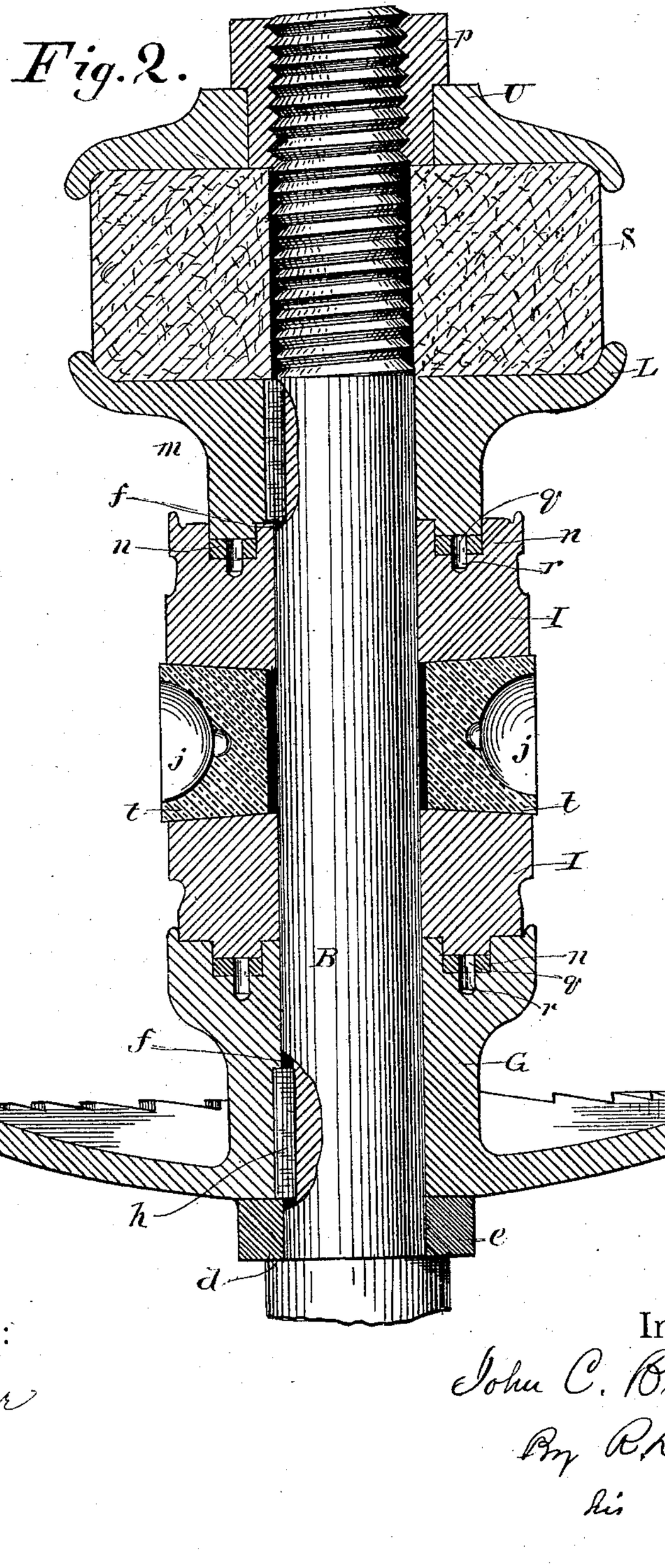
Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN C. BUTTERFIELD, OF CHICAGO, ILLINOIS.

STAMP-MILL.

SPECIFICATION forming part of Letters Patent No. 285,388, dated September 25, 1883.

Application filed May 1, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. BUTTERFIELD, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement Particularly Adapted to Stamp-Mills; and I do hereby declare that the following is an accurate description of the same.

When the pestle or stamp is long in action without rotation upon its axis—the same surfaces of pestle and mortar being continually opposed to each other—unequal wear takes place, because the feed always comes from one and the same side, and therefore the harder labor is continually encountered by one side of the pestle. To avoid this unequal wear the pestles are rotated upon their axes.

The object of my invention is to produce an automatic rotation of the stamp-rod.

For convenience I will represent and describe the mechanism as I have applied it to the pestle or stamp rod of my stamp-mill, heretofore patented to me August 3, 1880, and numbered 230,611, having reference to the accompanying drawings, wherein—

Figure 1 is a side elevation of a part of said machine, showing the front end of the walking-beam, with the stamp-rod and rotating device in position. Fig. 2 is an elevation of the same, partly in section. Fig. 3 represents in plan and elevation the pawl and its pivot-pin.

A is the walking-beam whereby the stamp-rod B is caused to reciprocate. In the ordinary stamp-mills the stamp is elevated by the tappet and falls by its own weight, only so that the blow is due to gravity alone and the speed of delivery is limited. In my machine the blow is assisted by an application of positive force, and the stamp being under equally positive control, the blows can be repeated with much greater rapidity than is possible when gravity alone is called into play. It is required, however, to construct a joint between the stamp-rod and its moving lever A which shall admit of the pounding action without being itself destroyed. In the patents heretofore granted to me for inventions pertaining to this and similar subjects I constructed said joint with an interposed mass of india-rubber to prevent this transmission of vibrations; but in this machine different means are used to render the joint durable, and at the said time to permit the revolution of the stamp-rod, as above described. I therefore form on one stamp-rod B, near its upper end, a shoulder, *d*, and make said rod cylindrical from said shoulder to its extremity, and fit a collar or ring, *e*, upon said shoulder. From the shoulder *d*, or thereabout, to the extremity of the rod B, I cut a groove or key-seat, *f*. Next above the collar *e*, I place the ratchet-disk G and secure it to the rod B by a key, *h*. Next above the ratchet-disk G, I place the cross-head I, having in its opposite sides the sockets *j* for the joint-pins *k*, whereby the cross-head is jointed to the beam; and above the cross-head I place the collar L, which is secured to the rod B by the key *m* in the keyway *f*. Therefore while the rod B may revolve freely in the cross-head I the ratchet-disk G and the collar L can only revolve with said rod. In order to reduce friction between these parts, it is advantageous to interpose the friction-rings *n*. The collar L is held in position by a screw-nut, *p*, at the top of the rod. This is a general description of the cross-head joint; but there are, in addition, some features of refinement, to which reference will be made. A groove, *q*, concentric to the axis, is turned in the upper end of the hub of the disk G, and the cross-head I is provided with a corresponding rib fitting said groove. The friction-ring *n* is laid in said groove. In the bottom of the groove *q* several pits, *r*, are drilled, to catch and hold oil, and the rings *n* themselves are perforated, so that oil may freely pass from one surface to the other, and by the rapid reciprocations of the stamp-rod oil will be thrown from the lower to the upper surface through said perforations, and both sides of the friction-ring will be thereby kept lubricated. At the upper side of the cross-head I there is a groove similar to *q*, and upon the collar L a rib corresponding to and fitted in said groove, and a friction-ring, *n*, is placed therein. In the revolution of the stamp-rod the rotary bearing-surfaces are these interlocking ribs and grooves. The sockets *j* are formed in tapering bushings *t*, which may be readily removed from the cross-head and be replaced with new ones if occasion requires.

Between the collar L and the nut *p*, I place a spring, which permits a slight elastic action in the cross-head connection, to relieve the shock in changing the direction of motion of the stamp-rod. For the purposes of this spring I prefer to employ a mass of india-rubber, and I confine it between the collar L and another similar collar, U, any required degree of pressure being secured by the nut *p*.

The edge of the disk G is provided with ratchet-teeth, and a pawl, V, is pivoted to the beam A in line with the teeth of the ratchet at the point of their greatest lateral distance from the beam, and a point preferably more distant from the joint-pin *k* than the semi-diameter of the ratchet-disk. The pivotal point of the pawl moves in a curve the center of which is the axis of the walking-beam A, and the rod B reciprocates in the tangent of the curve described by the joint-pin *k*, and it follows that during the movements of the beam A the pawl-pivot will alternately approach to and recede from said tangent and the angular position of said pivot, and the ratchet-disk will become correspondingly changed; hence the point of the pawl will be alternately thrust out and retracted at each reciprocation, and being in engagement with the ratchet-teeth on the disk G, the latter will be pushed around or partly rotated by positive means at each reciprocation of the stamp-rod. It is occasionally necessary to lengthen the stamp-rod B to compensate the wearing away of the surface of the stamp, and this I find it convenient to do by removing the ring *e* and replacing it with a thicker ring to lengthen the rod, or with a thinner one to shorten it. By making these rings and the adjacent surfaces interlocking grooves and ribs, as at *q*, said rings may be divided transversely and removed or inserted by merely raising or lowering the nut *p*, and without removing the rod B from the cross-head I.

Having described my invention, what I claim as new is—

1. The combination, in a stamp-mill, of the following instrumentalities, to wit: the rotating stamp-rod B, the cross-head I, the disks L U, and spring S, above said cross-head and rotating with said rod, the ratchet-disk G, similarly attached to said rod below said cross-head, as shown, and for the purpose described, the walking-beam A, provided with the cross-head, joint-pins *k*, and the gravity-pawl V in engagement with said ratchet-disk.

2. The walking-beam A, provided with the pivot-pins *k*, the cross-head I, and the stamp-rod B, passing through said cross-head and capable of rotating therein, combined with a ratchet-disk, G, attached to said rod and rotating with it, and the pawl V, pivoted to the walking-beam A upon a horizontal axis, substantially as described.

3. The cross-head I, walking-beam A, provided with the pins *k*, and the stamp-rod B, having shoulder *d*, and passing through and capable of rotation in said cross-head, combined with the disks G and L, located upon said stamp-rod, and capable of longitudinal movement, but incapable of rotation thereon, whereby said cross-head is confined, and a loose ring or rings, *e*, placed on said rod between said disk G and the shoulder *d*, whereby its effective length may be changed, as set forth.

4. The walking-beam A and stamp-rod B, combined with the disks G and L, each secured to said rod to prevent rotation thereon, the cross-head I, interposed between said disks and free to rotate on said rod, and means for securing these parts upon said stamp-rod, substantially as and for the purposes set forth.

5. The walking-beam A, stamp-rod B, the disks G L, and the cross-head I, secured upon said rod, as set forth, combined with friction-rings *n*, interposed as described.

6. The walking-beam A, stamp-rod B, cross-head I, within which said rod may rotate, and the disks G and L, secured to said rod, whereby said cross-head is confined, combined with the spring S, substantially as and for the purpose set forth.

JOHN C. BUTTERFIELD.

Witnesses:
R. D. O. SMITH,
J. C. TURNER.