(No Model.) 2 Sheets—Sheet 1.

W. E. HATHEWAY.

MARKING OR GRADUATING MACHINE.

No. 324,319. Patented Aug. 11, 1885.

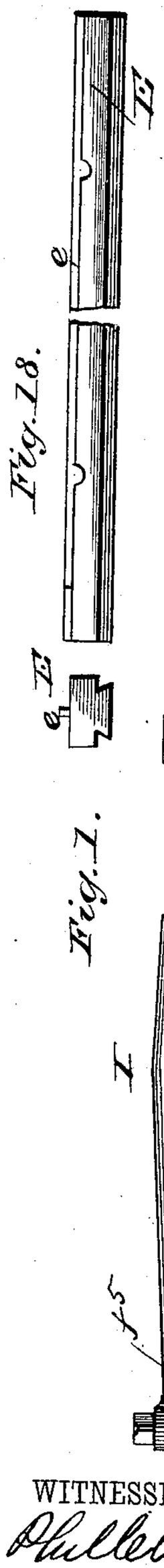

Fig. 1.

Fig. 1a.

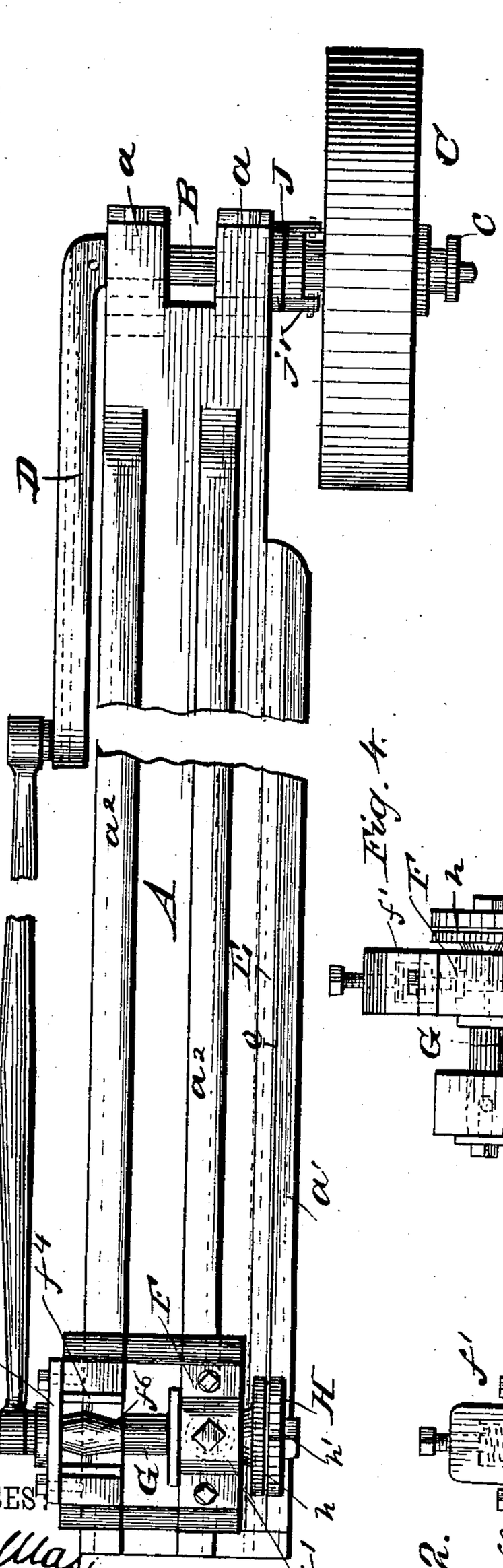

Fig. 1b.

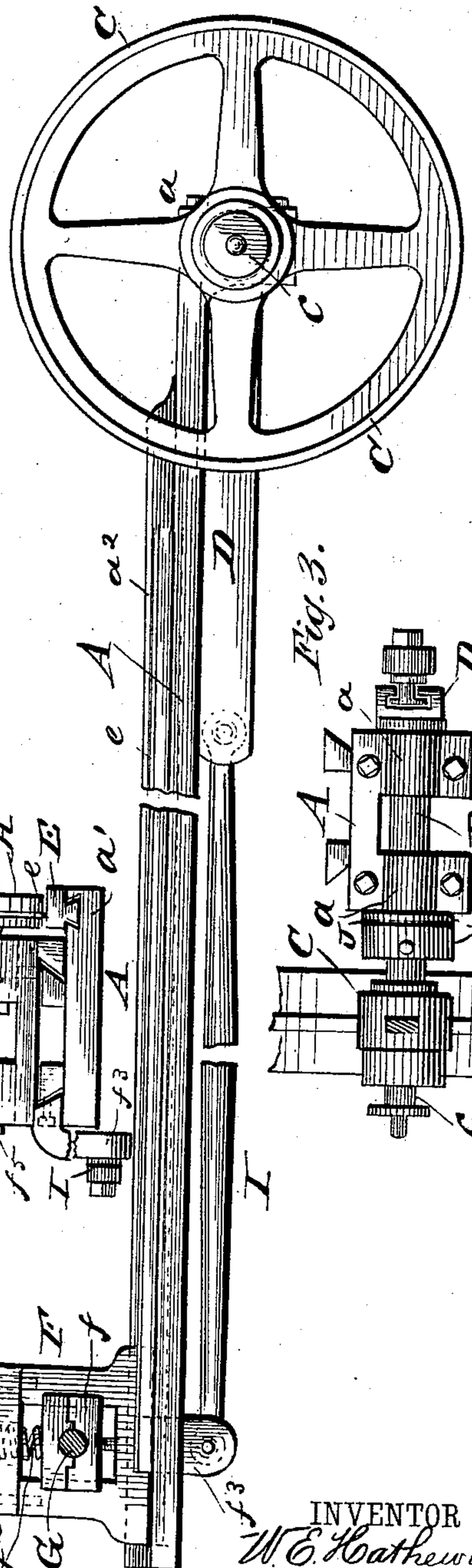

Fig. 3.

Fig. 4.

Fig. 2.

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No Model.)

2 Sheets—Sheet 2

W. E. HATHEWAY.

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Fig. 5.

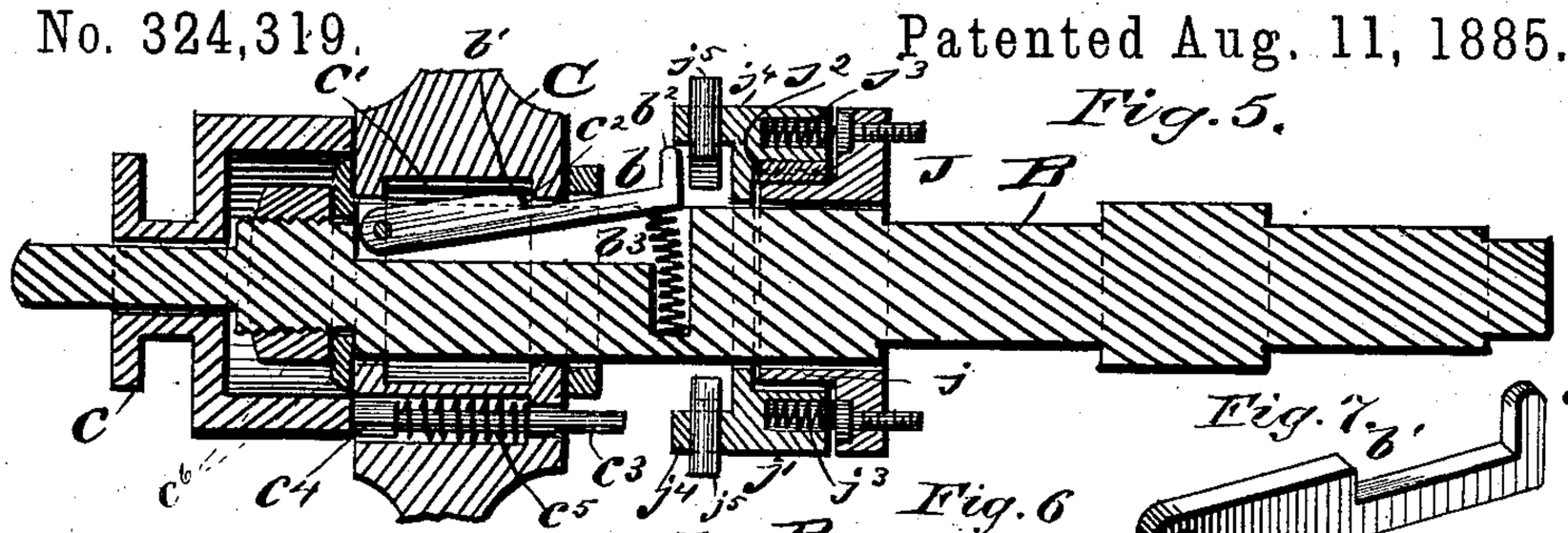


Fig. 6

Fig. 10

Fig. 7.

Fig. 8

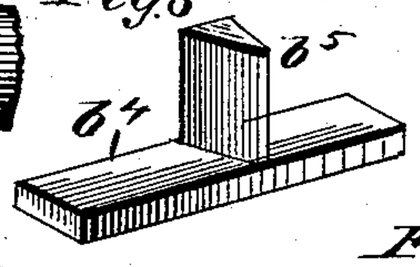


Fig. 9.

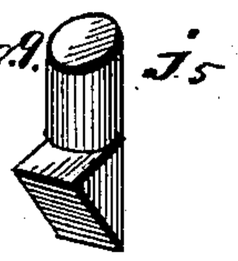


Fig. 11.

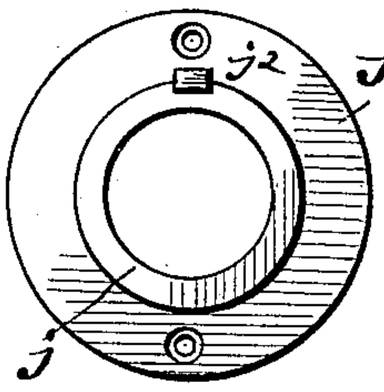


Fig. 12.

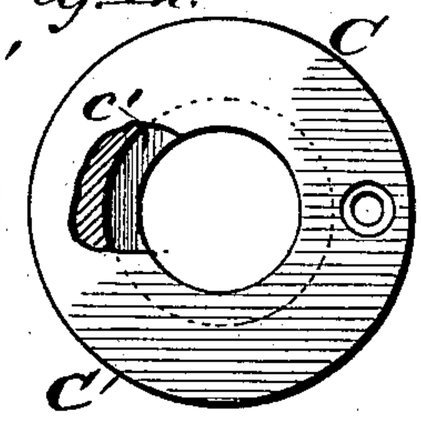


Fig. 13.

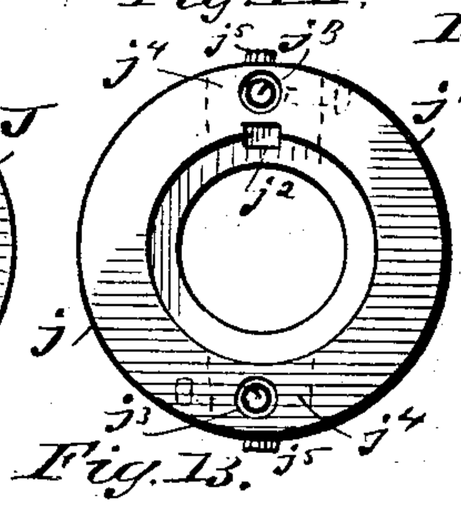


Fig. 17.

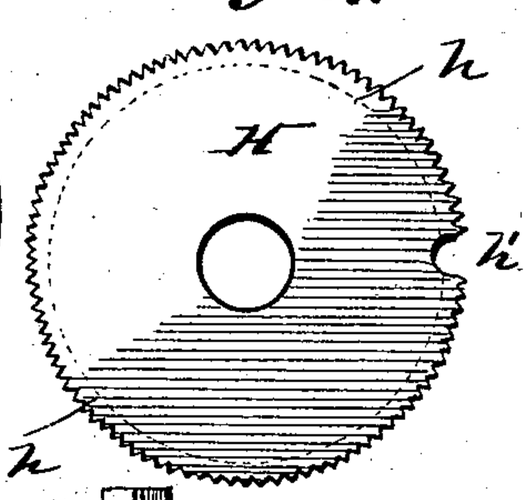


Fig. 14.

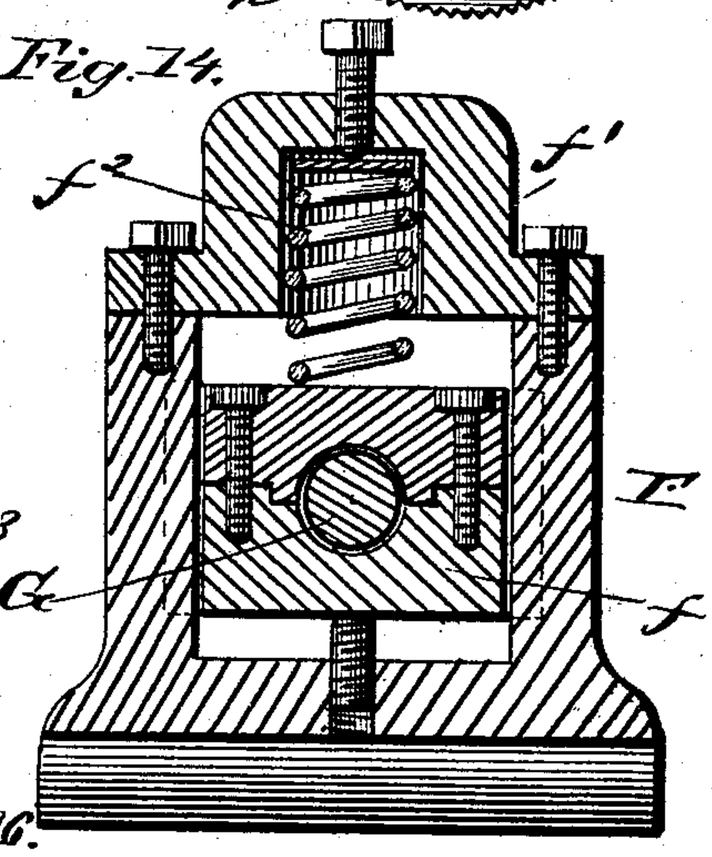
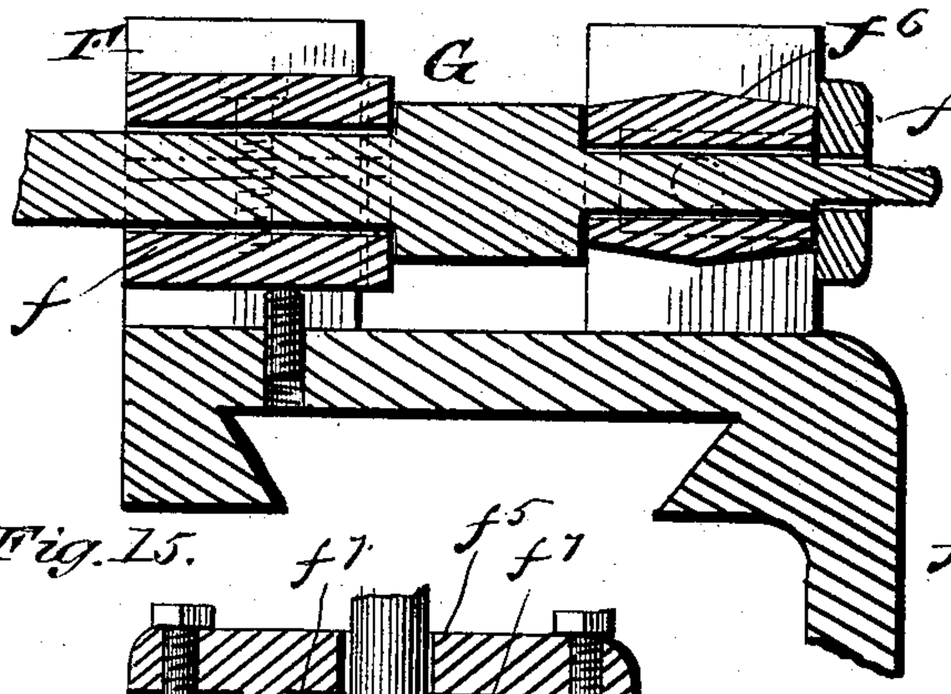


Fig. 15.



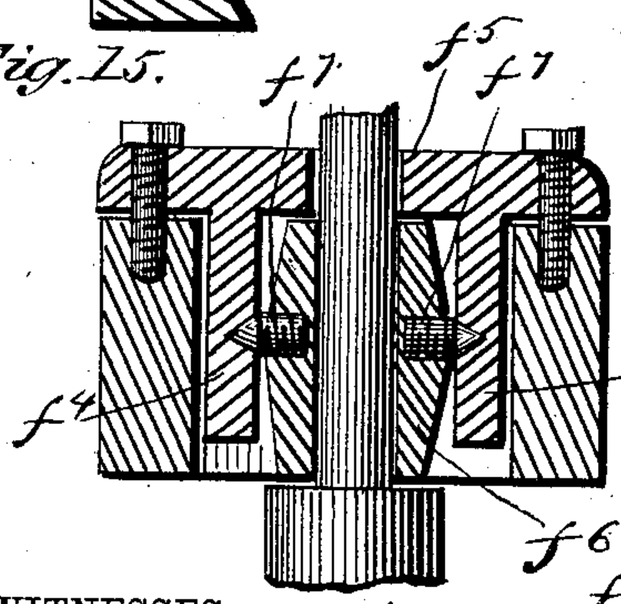
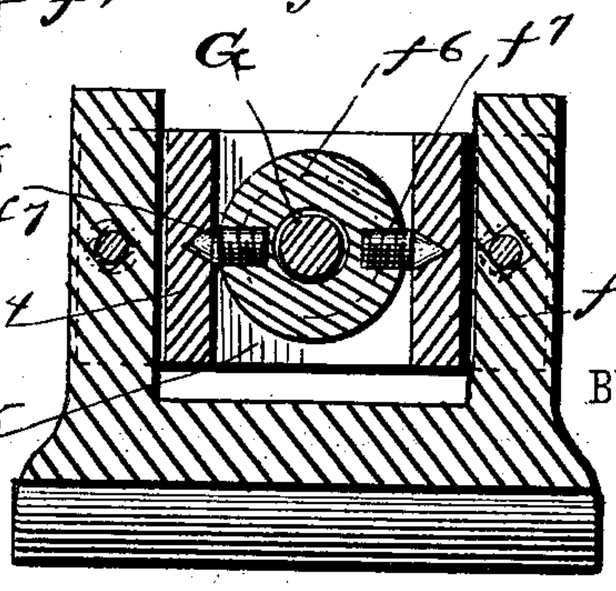


Fig. 16.



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UNITED STATES PATENT OFFICE.

WILLIAM E. HATHEWAY, OF UNIONVILLE, CONNECTICUT.

MARKING OR GRADUATING MACHINE.

SPECIFICATION forming part of Letters Patent No. 324,319, dated August 11, 1885.

Application filed October 30, 1884. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. HATHEWAY, a citizen of the United States, residing at Unionville, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Marking or Graduating Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a plan view of my device. Fig. 2 is a side view of the same. Fig. 3 is a detail view. Fig. 4 is an end view. Fig. 5 is a vertical sectional view. Figs. 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, and 18 are detail views.

This invention relates to improvements in the art of making the divisions on rules, yard-sticks, &c.; and it consists in the construction and novel arrangement of devices constituting a machine for making said divisions, as hereinafter fully described, and pointed out in the claims.

The general construction of the machine is as follows: A is the bed or frame of the machine, of irregular rectangular shape.

B is a transverse driving-shaft turning in the bearings *a a* at one end of the frame, and carrying on opposite ends the driving-pulley C and the crank-arm D.

E is the bed-block upon which the rule rests, dovetailed, and fixed with set-screws upon the lateral projection *a'*, on the same side of the frame as the driving-pulley.

F is a head-block sliding upon dovetailed ways a^2 a^2, made on the upper surface of the frame from the end opposite the driving-shaft.

G is a transverse shaft turning in proper bearings in the sliding head.

H is the marking-roller fixed to the end of the shaft G, on the same side of the frame as the pulley C, and arranged to pass over and bear upon the rule as the machine acts; and I is a connecting-rod, the rear end of which turns on the end of the shaft G opposite the marking-roller, its front end being connected with the crank-arm D, which is adjustable to different lengths, so as to give the sliding head different distances of travel in marking rules of various lengths.

The rule being fixed in place, when the driving-shaft is rotated by the pulley C the action of the crank-arm and connecting-rod will cause the sliding head to move along the frame, and the marking-roller will rotate over the rule beneath, scoring thereon the divisions as it advances. The pulley C turns loosely on the shaft B, and the latter has upon it a clutch, by means of which the shaft turns with the pulley for one-half revolution, and the latter then turns free for a full revolution, &c.

Of course the rules are marked on the half-revolution of the shaft, the free revolution of the shaft being for the purpose of giving the operator time to remove one rule and put another in place. The machine then being inactive the means of accomplishing the result is as follows:

c is a sliding collar outside the pulley and moved on the shaft B by means of a fork, which engages a circumferential recess in the collar, the arm of the fork being secured to a treadle. When the operator bears on the treadle, the collar is driven up against the hub of the pulley.

c' is a circular recess around the bore of the pulley on its inner side of proper depth, and c^2 is a detent standing in said recess.

c^3 is a pin passing through an opening in the hub of the pulley near its edge at a proper distance from the detent c^2. One end of the pin projects a considerable distance from the inner surface of the pulley, and the opposite end is made into a head, c^4, which projects for a proper distance from the outside of the pulley.

c^5 is a coil-spring surrounding the pin within the enlarged part of the opening in the hub and bearing against the shoulder of said opening and the head c^4.

It is evident that when the collar *c* is operated the end of the pin will be driven inward.

c^6 represents the nut and washer by which the pulley is kept in proper place.

b is a detent bar pivoted by its outer end in a longitudinal recess in the enlarged portion

of the shaft between the washer c^6 and the frame A. Said bar has upon it the vertical detent point and shoulder b' b^2, respectively.

b^3 is a spiral spring in an inward extension of the longitudinal recess, which spring by its action drives the detent-bar outward.

b^4 is a bar sliding in a longitudinal slot in the enlarged portion of the driving-shaft, and having extending at right angles from it an arm, b^5, the inner face of which is beveled, as shown. On the shaft the bar b^4 in the direction of rotation is just as far behind the detent b as on the pulley. The pin c^3 is behind the detent c^2.

J is a circular collar surrounding the shaft and facing the pulley, being screwed to the edge of the frame, and j is a hub thereon.

j' is a sliding collar surrounding the hub and keyed at j^2 to the collar J.

j^3 j^3 are opposite coil-springs bearing against the surface of the collar J, and entering recesses in the collar j'.

j^4 j^4 are opposite arms standing at right angles from the surface of the collar j' and facing the pulley. j^5 j^5 are similar detent-bars passing at right angles through said arms and having their inner ends beveled, as shown.

When the machine is in operation, the collar c is pushed inward by the operator bearing on the treadle, so that the pin c^3 is driven inward as far as possible. Suppose the shaft to be rotating with the pulley, the collar j' stands out from the collar J by the action of the coil-springs j^3, and the detent-bar b stands out from the shaft by the action of the coil-spring b^3. As soon as the point b^2 of the detent-bar comes against one of the bars j^5, the beveled end of the latter depresses the former and disengages the shoulder b' from the detent c^2 of the hub of the pulley, consequently releasing the latter from the shaft. The pulley then rotates alone until the point of the pin c^3 engages the beveled face of the arm b^5, sliding it forward, and causing the edge of the bar b^4 to engage and drive back the collar j' against the springs j^3, and consequently releasing the point b^2 from the detent j^5, which has engaged it. The bar b then rises, and the shoulder b' engages the detent c^2, locking the shaft and pulley. At the next half-revolution the point b^2 engages the other bar, j^5, and the shaft is again disengaged from the pulley. As the sliding bar b^4 is just as far behind the bar b as the pin c^3 is behind the detent c^2, it is evident that the releasing of the bar b must correspond with its engagement with the detent c^2. It is also evident that when the bar b is depressed the pulley must make an entire rotation alone before it can be again engaged with the shaft, as the pin c^3 must make a complete revolution around the shaft before it can again engage the sliding bar and release the detent-point b'.

To totally disengage the pulley and shaft the operator raises his foot from the treadle, and the action of the spring c^5 forces the collar c and pin c^3 back, so that the latter cannot engage the sliding head.

The head-block E, upon which the rule rests and upon which it is held down by springs at the end and outside of the frame, is divided longitudinally by a thin metal plate or fence, e, which rises from its upper surface. On the outside of this fence is placed the rule, and on the inside a similar but longer bar of soft wood, for a purpose hereinafter explained.

The end of the sliding head-block F adjacent to the marking-roller is properly recessed to admit the journal-box f, which forms one bearing for the shaft G. f' is a cap bolted over said roller and recessed for the accommodation of the strong coil-spring f^2, which bears down on top of the journal-box f and makes the marking-roller also bear down upon the rule. It also allows a little upward give as the roller is passing over the brass. The lower part of the journal-box rests on a vertically-adjustable screw, as shown.

f^3 is an arm depending from the side of the sliding head opposite the marking-roller, to the lower end of which the end of the connecting-rod I is attached to bring centers in a straight line, as the connection of the crank-arm to the driving-shaft is just as far below the frame A.

f^4 is a rectangular fork fitting into a transverse slot in the side of the sliding head opposite the roller, and retained therein by bolts which pass through the transverse bar f^5.

f^6 is the journal-box opposite f, of double conical or other proper form, and provided on its sides with the central opposite screw-trunnions, f^7 f^7, the pointed outer ends of which have proper bearings in the fork f^4. By this means the bearing f^6 will accommodate itself to the shaft G when the latter is moved out of the horizontal by the movement of the bearing f.

H is the marking-roller, retained in place on the shaft G by means of a collar next to the sliding head and a nut on the opposite side. h is a central circumferential groove around the marking-roller, into which the fence e passes when the roller is moving. The marking-roller is properly scored on its edge outside of the groove h for inches, halves, and eighths, (or twelfths,) or any other desirable divisions, just as they are seen on rules, the inch-marks extending across the whole edge. On the inside all the scores pass across that part of the edge of the roller, and are merely intended to bear and hold on the above-mentioned strip of wood when the roller is off the rule. h' is a semi-circular groove made in the outside part of the edge of the roller to allow the latter to pass properly over the metal joints of the rule that extends upward from its face.

The manner of operating the machine is as follows: The rule being fixed in position the crank-arm D is adjusted to give the sliding head the proper length of motion, and also to bring the groove h' into position to pass freely

over the brass joints of the rule, said groove being made at the sixth inch of the roller so that the rule will be marked right. The machine is then put in motion and the rule is marked, the roller passing beyond the same and keeping its proper marking-distance by engaging on the strip of wood on the other side of the fence. The machine having made a half-revolution the driving-shaft and pulley disengage by means of the described mechanism, and the pulley makes a complete revolution alone, giving the operator time to replace the marked by an unmarked rule. The pulley and driving-shaft then couple, and the sliding head and marking-roller pass back to the rear end of the machine, marking the second rule. The marking-roller moves in opposite directions upon every alternate half-revolution of the crank-arm; but the result is necessarily the same, as it passes over alternate rules from opposite ends, making the same scores, the throw of the crank-arm and position of the rules being adjusted to effect this purpose.

Having thus described my invention, what I desire to secure by Letters Patent, is—

1. In a machine to mark rules, the combination, with the frame of the same, a head-block sliding thereon, a rule-bed fixed to the frame, and a marking-roller arranged to pass over and mark the rule on the bed, and fixed to one end of a shaft having bearings in the sliding head, of a rod or pitman connecting the other end of said shaft with a crank-arm fixed to the driving-shaft, which carries a driving-pulley, and mechanism whereby said shaft and pulley may be alternately engaged or coupled for one half-revolution and disengaged for one whole revolution, the pulley rotating continuously, substantially as specified.

2. In a machine to mark rules, the combination, with the frame A, driving-shaft B, detent-bar b, spring b^3, and sliding bar b^4, of the driving-pulley C, sliding collar c, detent c^2, spring-pin c^3, collars J and j', springs j^3, and detent-bars j^5, substantially as specified.

3. In a machine to mark rules, the combination, with the frame A, sliding head-block F, shaft G, and marking-roller H, of the journal-box f and f^6, cap f', coil-spring f^2, fork f^4, and proper means to reciprocate the head-block on the frame, substantially as specified.

4. In a machine to mark rules, the combination, with the marking-roller H, provided with the groove h and notch h', and fixed to the shaft G, turning in bearings in the sliding head F, of the bed-block E, provided with the fence e, and a strip of wood similar to but larger than the rule, which strip lies on the inner side of the fence while the rule lies on the outer side, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM E. HATHEWAY.

Witnesses:

WM. A. HITCHCOCK,

W. W. WOODFORD.