

(No Model.)

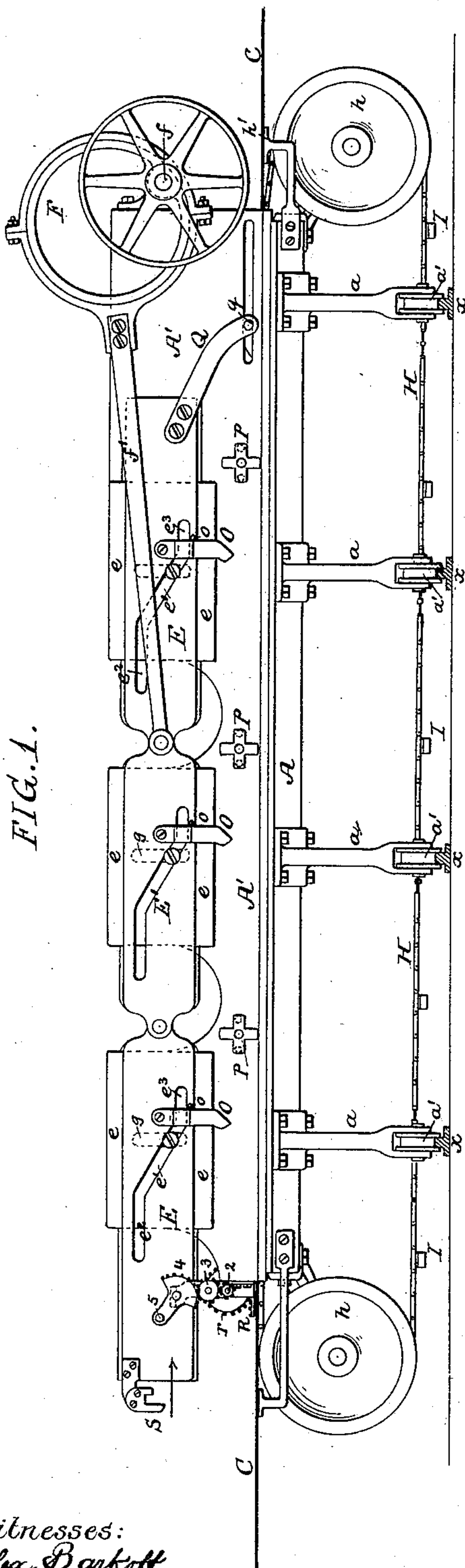
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H. A. BOUCHER.

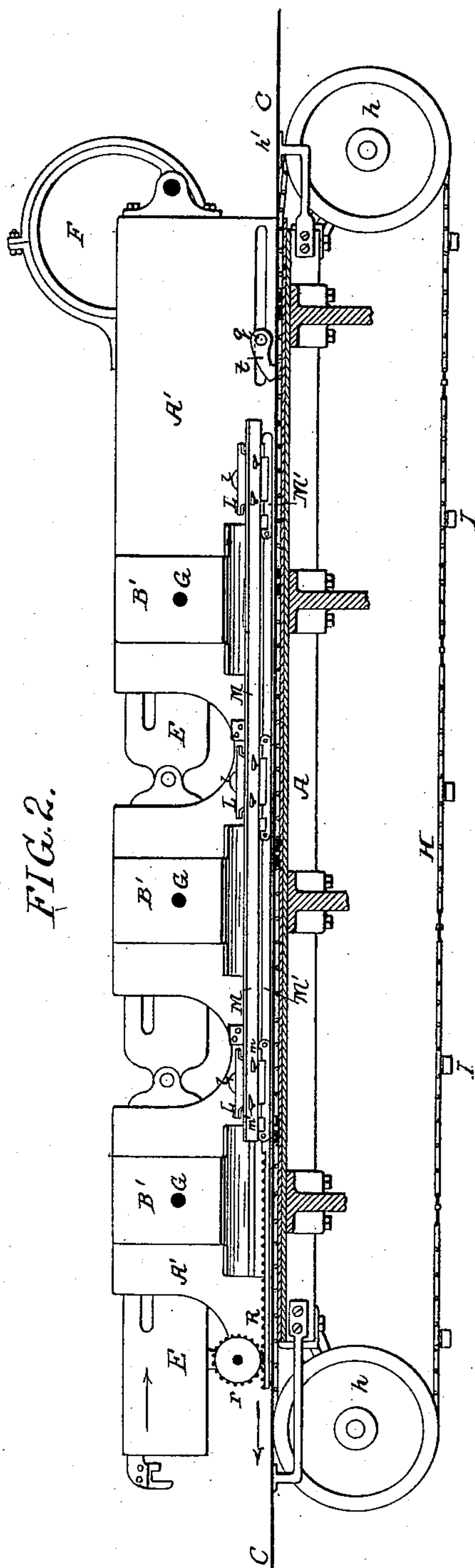
OIL CLOTH PRINTING MACHINE.

No. 364,890.

Patented June 14, 1887.



Witnesses:  
*Alex. Barkoff*  
*David S. Williams.*



Inventor:  
*Henry A. Boucher*  
by his Attorneys  
*Howson and Co.*

(No Model.)

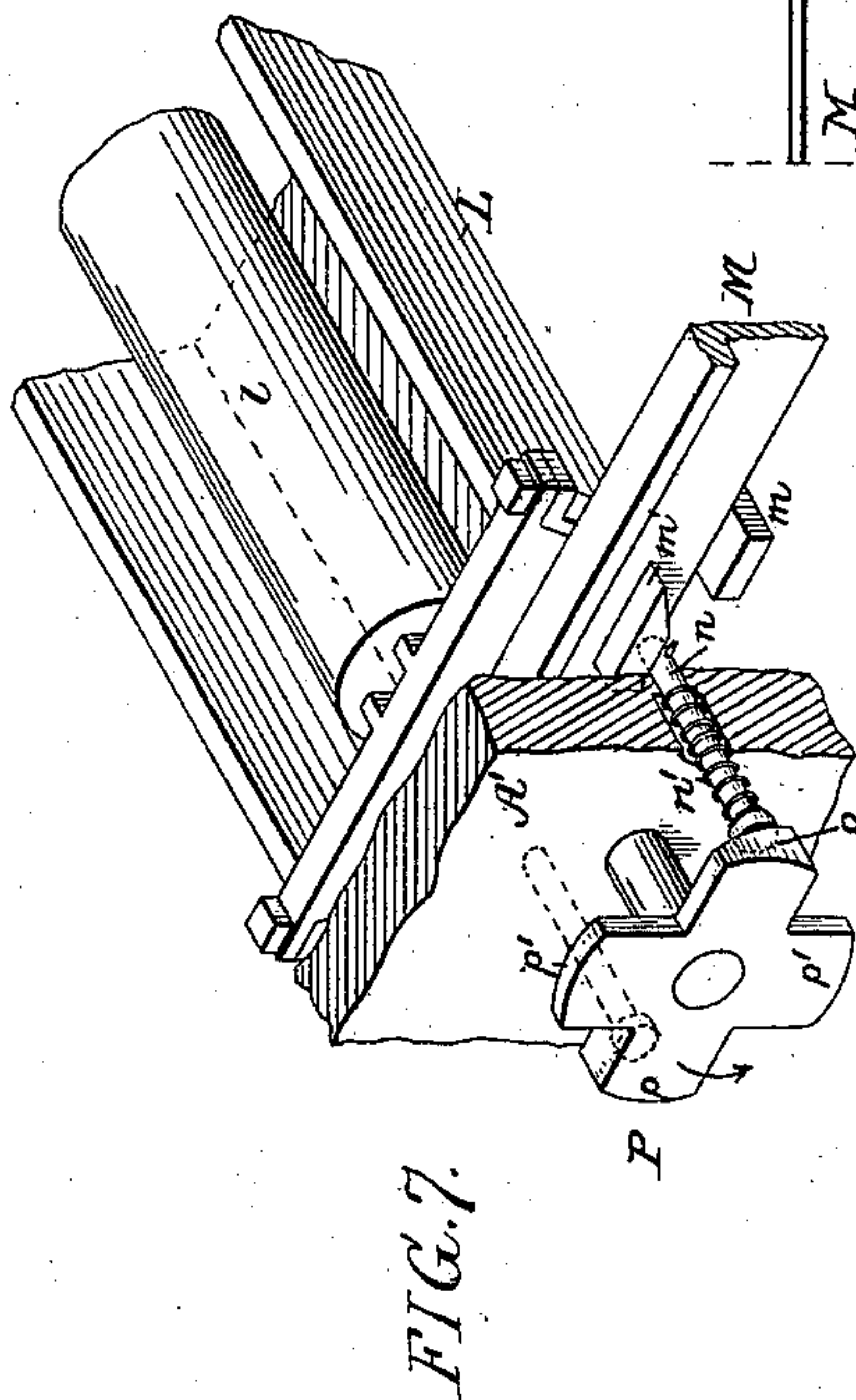
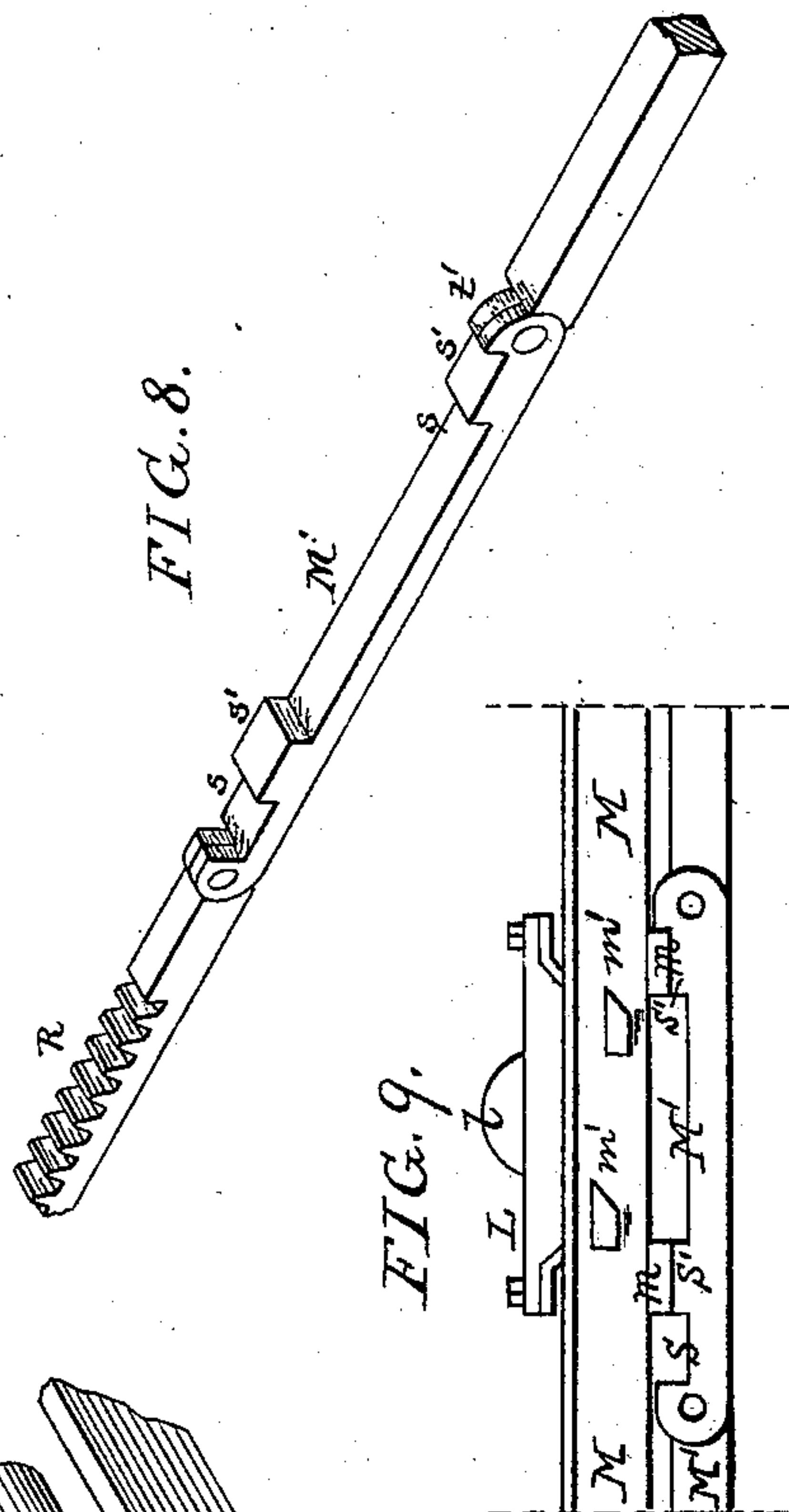
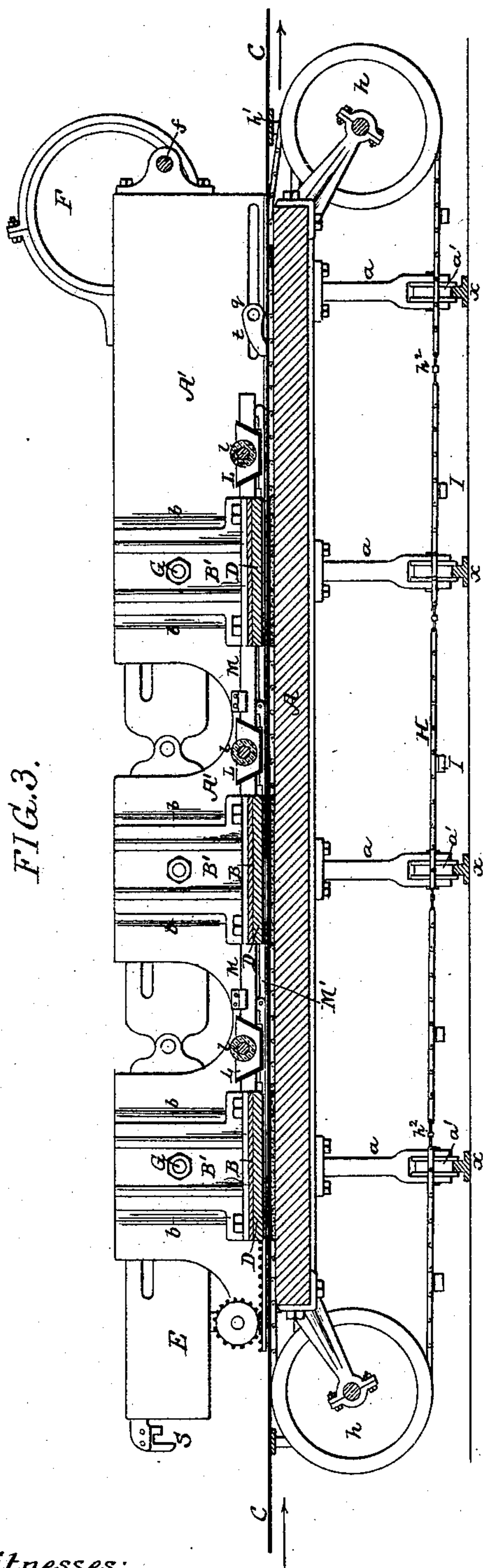
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3 Sheets—Sheet 3.

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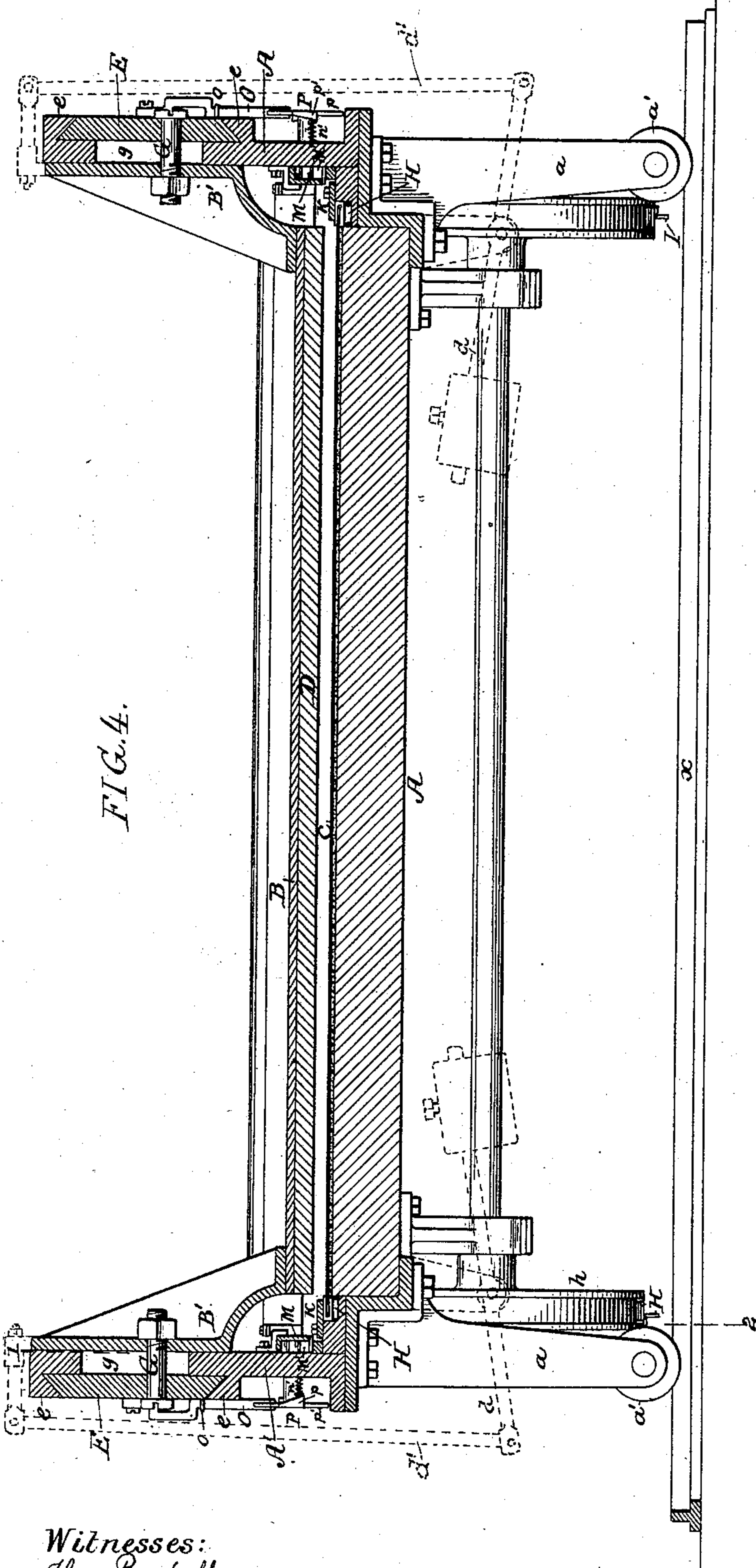


FIG. 4.

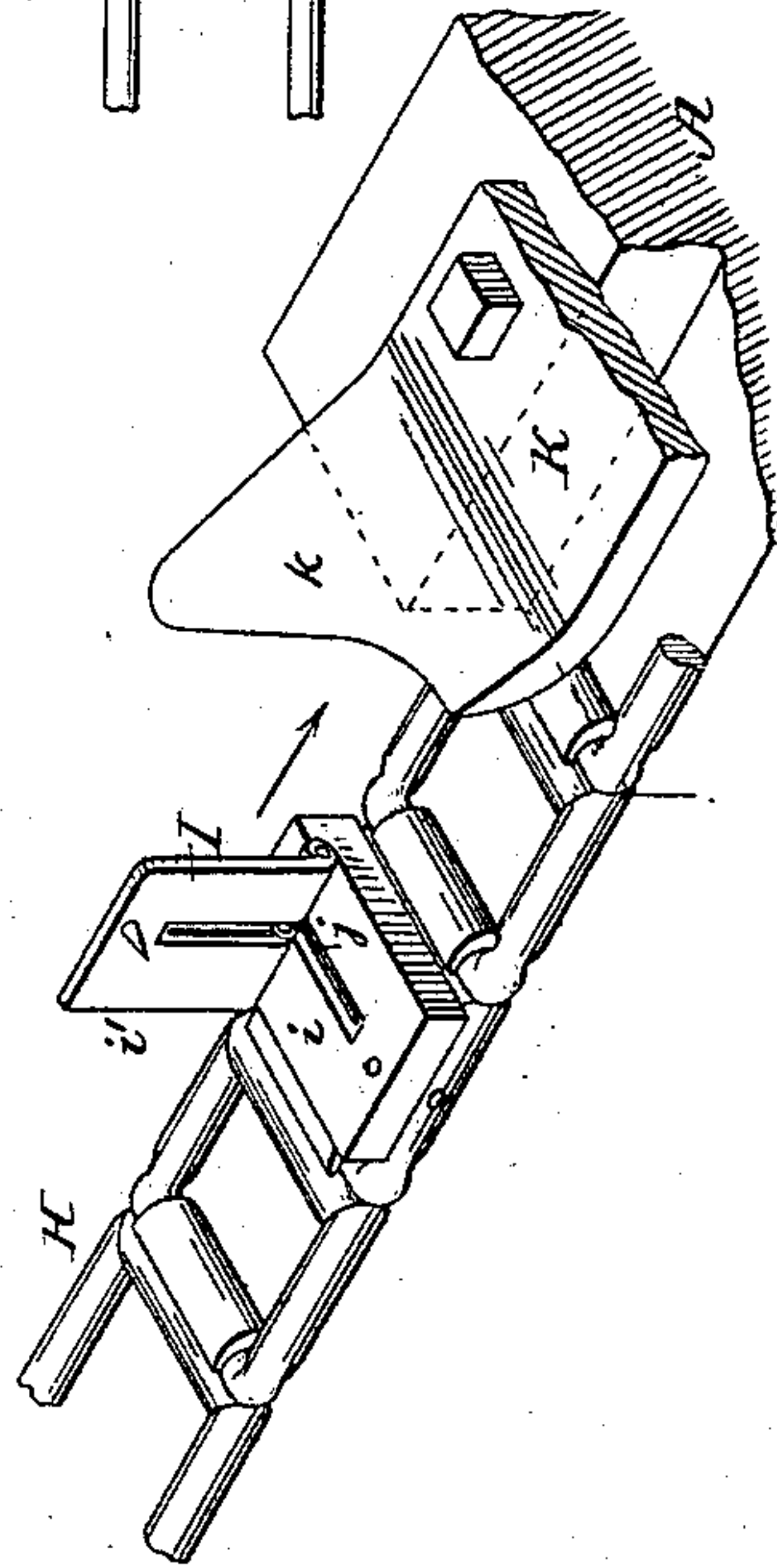


FIG. 5.

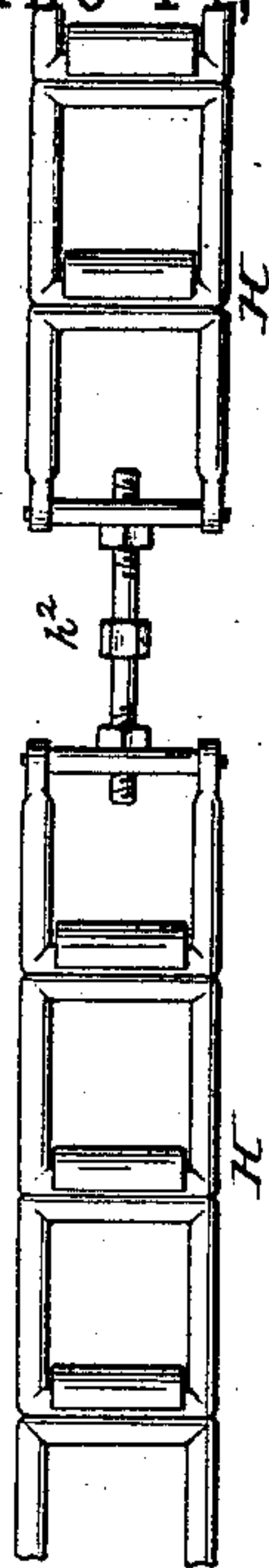


FIG. 6.

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Inventor:  
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Howson and Sons



# UNITED STATES PATENT OFFICE.

HENRY A. BOUCHER, OF PHILADELPHIA, PENNSYLVANIA.

## OIL-CLOTH-PRINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 364,890, dated June 14, 1887.

Application filed July 6, 1886. Serial No. 207,230. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY A. BOUCHER, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Oil-Cloth-Printing Machines, of which the following is a specification.

My invention relates to that class of oil-cloth-printing machines in which the cloth passes between a bed-plate and reciprocated platens carrying the printing-blocks, the cloth being at rest while the impression is being made, and being fed forward while the impression blocks and platens are lifted and while the color is being applied to the blocks by traveling color-boxes.

The main objects of my invention are to simplify and improve the mechanism for operating the platens carrying the color-printing blocks, to construct the mechanism for feeding the oil-cloth, so as to obtain a true registry of the successive impressions, and to so construct the devices for traversing the color-boxes that the color will be applied to the faces of the blocks as the said boxes travel in one direction only, and so that, when desired, the color may be applied to the printing-blocks at every other impression only.

In the accompanying drawings, Figure 1 is a side view of my improved oil-cloth-printing machine. Fig. 2 is a longitudinal section on the line 1 2, Fig. 4. Fig. 3 is a central longitudinal section of the machine. Fig. 4 is a transverse section drawn to an enlarged scale. Fig. 5 is a perspective view illustrating a portion of the feeding devices for the cloth. Fig. 6 is a plan view of a portion of one of the feed-chains. Fig. 7 is a perspective view of a portion of one of the color-boxes and its operating devices. Fig. 8 is a perspective view of a portion of one of the bars controlling the movement of the color-boxes; and Fig. 9 is an end view of one of the color-boxes and parts of the carrying-bars.

In the present drawings I have illustrated my machine as provided with three sets of printing devices, including three printing-blocks for three sets of colors of the pattern; but it should be understood that the machine may be constructed with any desired number of such printing-blocks and their operating devices.

The bed A of the machine is mounted on legs *a*, having flanged wheels or rollers *a'*, adapted to traverse on rails *x* on the floor of the factory, so that the machine can be readily moved from one set of drying-racks to another, as occasion may demand.

The bed-plate A of the machine is of about the width of an ordinary cloth to be printed, and is provided with side frames, A', extending upward from the bed-plate. Each side frame A' is provided on the inside with pairs of vertical dovetail guides *b*, corresponding in number with the number of printing-blocks to be used. To these guides *b* are adapted brackets B', carrying the platens B, to the faces of which the printing-blocks D are secured. To raise and lower these platens with their printing-blocks, I make use of longitudinal reciprocating cam-bars E, adapted to corresponding longitudinal guides, *e*, on the outside of the side frames, A', and to impart the necessary reciprocating motion to these cam-bars I prefer to use an eccentric, F, on the main shaft *f*, which may be driven in any ordinary way. The eccentric gives a steady movement, which is of great importance in oil-cloth-printing machines, where a true registry of the successive impressions is absolutely necessary. The straps of the eccentrics are connected to the bars E by the usual connecting-rods, *f'*.

In the drawings I have illustrated the bars E as being made in sections; but these sections are firmly bolted together, so that in operation and effect the several sections constitute one bar. Each bar E is provided with cam-slots E', corresponding in number to the number of platens and printing-blocks used, and the brackets B of the platens carry pins or projections G, which pass freely through vertical slots *g* of the side frames and into the cam-slots E' of the bars E. These cam-slots are in three parts—one inclined part, *e'*, for the purpose of raising and lowering the platens as the bars are reciprocated, a straight portion, *e''*, at the upper end of the inclined part, for the purpose of retaining the platens and printing-blocks in an elevated position while the color is being applied and while the cloth is being fed forward, and a shorter straight portion, *e'''*, at the lower end of the inclined portion of the slot, to press the printing-blocks onto the cloth.



If desired, I may use in connection with the above-described mechanism some counterbalancing devices to partly counterbalance the weight of the platens and printing-blocks, so as to reduce the friction on the reciprocating bars E. For instance, in Fig. 4 I have indicated in dotted lines a form of counter-balance which may be used, and which consists of counterweighted levers  $d$ , pivoted to the under side of the bed-plate, and acting on the platens through connecting-rods  $d'$ , connected to the brackets B'. It will be understood, however, that other forms of counter-balance may be used.

Immediately below each platen on the bed A of the machine is a suitable impression-blanket, over which the cloth C passes. The cloth is fed forward intermittently by means of intermittently-operated endless chains H H, which pass over suitable pulleys,  $h$ , at each end of the machine, and, as illustrated in Fig. 4, these chains traverse longitudinal grooves on each side of the bed-plate of the machine. Each chain is provided at intervals with nippers I, so as to grasp the fabric.

In the drawings each nipper is shown as composed of a pair of jaws,  $i$   $i'$ , hinged to each other, and having a spring,  $j$ , to tend to separate and hold the two at right angles, as indicated in Fig. 5. One of the jaws,  $i$ , is secured to the feed-chain H, and the other carries a pin or pins, or teeth, to get the necessary hold on the cloth.

In order to automatically close these jaws to grip the edges of the cloth as the chain enters its longitudinal groove along the bed of the machine, and to keep the jaws closed until the cloth emerges from the opposite end of the machine, I provide a holding-down plate, K, along the top of each chain-groove. At the entering end  $k$  each plate K is made funnel shape, as shown in Fig. 5, so that as the open jaws advance the funnel-shaped end  $k$  has the effect of pushing down the free hinged jaw  $i'$ , to grip the cloth against the opposite jaw, and the plates K keep the jaws closed as the chains travel along the bed-plate. When the grippers reach the opposite ends of their grooves in the machine where the oil-cloth comes out, they are freed from the holding-down plate K, and the spring  $j$  opens the jaws to release the fabric, which passes over the guide  $h'$  and onto the drying-racks, while the feed-chains pass around the end pulleys,  $h$ .

To impart the desired intermittent feed motion to these chains, I provide on the bars E arms Q, having pins  $q$ , passing through horizontal slots in the side bars and provided on the inside of the side bars with pivoted pawls  $t$ . These pawls, as the bars are moved away from the driving-shaft  $f$ , slide over the chains and the surfaces of the holding-down plates K; but when the side bars begin their return movement the noses of the pawls  $t$  enter slots in the plates K and engage with the links, so as to draw the chains and cloth forward with the movement of the bars. The feed-chains,

and consequently the cloth to be printed, are thus intermittently fed forward a certain distance equal to a certain number of links, and this exactly equal to the widths of the printing-blocks.

L L are the color-boxes, provided with rollers  $l$ , carrying the colors and adapted to come into contact with the faces of the printing-blocks when the latter are raised out of contact with the cloth, and when these boxes are traversed underneath the printing-blocks.

In oil-cloth-printing machines as heretofore constructed it has been customary to simply traverse the color-applying devices across the faces of the printing-blocks and to apply the color on both the backward and forward movements. This is sometimes objectionable, however, because the color-roller on the return movement is apt to remove from a part of the block some of the color which has been applied in the forward movement, and an uneven impression is thus produced.

I so construct my devices for operating the color-boxes that the color will be applied to the faces of the printing-blocks only as they traverse in one direction. The color-boxes are secured at opposite ends to a pair of flanged bars, M M, which may or may not be connected by cross-pieces to form a frame, and these bars are adapted to traverse on ways with their flanges in contact with the inside faces of the side frames, A', as shown in Fig. 4. These bars are provided at intervals on their under sides with feet or projections  $m$ , Fig. 7, resting on steps on the traversing-bars M', as hereinafter described. Each bar M' has at the end of the machine where the cloth enters a rack, R, Figs. 1, 2, and 8, into which gears a spur-wheel,  $r$ , on the frame. To the axis of this spur-wheel is secured, on the outside of the frame, a pinion, 2, gearing into an idler, 3, which in turn meshes with a toothed quadrant having an arm and finger, 5, which projects into the path of an open jaw, S, on the end of the corresponding slide-bar, E, Figs. 1 and 2. As the slide-bars E traverse in the direction of the arrow, Fig. 1, therefore these jaws S will engage with the projections on the arms of the quadrants 4, and through the gearing described will impart movement to the racks R, bars M' and M, and the color-boxes carried thereby, so as to traverse the latter across the faces of the elevated printing-blocks in the direction of the arrow, Fig. 2. Each bar M' is provided with two pairs of steps—one,  $s$ , at a slight distance below the other pair,  $s'$ , as shown more fully in Figs. 8 and 9—and on either of these pairs of steps the corresponding feet,  $m$ , of the bars M are adapted to rest. When the bars M are on the lower pair of steps,  $s$ , the tops of the color-rollers will be below the line of the faces of the printing-blocks, so that if then the color-boxes are traversed beneath the latter no color will be applied to the blocks; but when the bars M are on the upper pair of steps,  $s'$ , and the color-boxes are then traversed beneath the blocks



the rollers will be in position to apply color to the faces of the blocks.

To elevate the bars M from the lower to the upper pair of steps, I provide along the outer face of each flanged bar pairs of cams  $m'$ , Fig. 7, which are adapted to act in connection with pins  $n$  on the side frames, A'. These cams  $m'$  are such and the pins  $n$  are in such position that the cams will slide up on the pins  $n$ , and so raise the bars when the color-boxes reach the end of their movement toward the discharge end of the machine, as shown in Fig. 2, so that when the bars M are first moved forward, by the mechanism above described, in the direction of their arrow, Fig. 2, the upper steps,  $s$ , of the bars M' will pass under the feet  $m$  of the bars M, and the projections  $t'$ , Fig. 8, on the bars M' will catch the said feet  $m$  and cause the bars M of the color-boxes to traverse with the bars M' at such a height as to apply color to the faces of the raised printing-blocks. When the return movement of the bars M' takes place, the feet  $m$  of the bars M will fall into the lower steps of the bars M', so that as the color-boxes move back again no color will be applied to the faces of the printing-blocks.

In some cases it is desirable that color shall be applied to the faces of the printing-blocks only at every other impression, and to do this automatically I make use of the devices which I will now proceed to describe. Instead of having the pins  $n$  fixed to the side frames, A', they may be adapted to slide therein and be provided with springs  $n'$ , as shown in Fig. 7, which tend to prevent their inner ends from protruding into the path of the cams  $m$ . In order, however, to force these pins  $n$  into the path of these cams, I provide a four-armed cam-piece, P, mounted to turn on a pin on the outside of the side frame for each pair of pins  $n$ . Two of the arms of this piece P have on their inner side inclined or cam faces  $p$ , while the other arms,  $p'$ , have no cams, so that when the piece P is turned to bring the cams  $p$  to bear on the outer ends of the pins  $n$  their inner ends will be pushed into the path of the cams  $m'$  on the bars M, to raise the color-boxes at the end of their movement onto the upper steps of the bars M', as above described. On the other hand, when the cam-piece is turned to bring the arms  $p'$  opposite the ends of the pins  $n$ , the latter will be forced outward by their springs  $n$ , so that their inner ends do not protrude into the paths of the cams  $m'$ , and the color-boxes will therefore remain on the lower steps,  $s$ , of the bars M', and no color will then be applied to the faces of the printing-blocks, as the color-boxes are traversed in either direction. To turn these cams P, I pivot a corresponding number of pawls, O, to the sliding bars E, as shown in Fig. 1, and provide stop-pins  $o$  on the bars, so that as the bars traverse in the direction of their arrow, Fig. 1, these pawls will slide over the cam-pieces P; but as they move in the opposite direction they will give but a quarter-turn to

the cam-pieces to throw the pins  $n$  alternately into and out of action at the successive backward and forward movements.

In order to make up for wear, I make the feed-chains H in sections united by right and left hand screw-bolts  $h^2$ , Fig. 6, so as to provide for a certain amount of adjustment and wear.

I wish it to be understood that I do not claim, broadly, the horizontal reciprocating cam-bars for operating the platens carrying the printing-blocks.

I claim as my invention—

1. The combination of the bed-plate and side frames of an oil-cloth-printing machine, with horizontal reciprocating cam-bars E, having cam-slots, platens carrying the printing-blocks, and brackets carrying the platens and provided with pins adapted to the cam-slots in the bars, substantially as specified.

2. The combination of the bed-plate and side frames of an oil-cloth-printing machine, with horizontal guides on the outside and vertical guides on the inside, platens carrying brackets adapted to the inside guides, and operating cam-bars adapted to the outside guides, substantially as described.

3. The combination of the bed-plate and platens of an oil-cloth-printing machine, with operating cam-bars for the platens, feed-chains for the cloth, and pawls carried by the said bars and adapted to engage with the chains, substantially as described.

4. The combination of the bed-plate and platens of an oil-cloth-printing machine, with feed-chains for the cloth having spring gripping-jaws, and holding-down plates having funnel-shaped ends, to automatically close the spring-jaws as the chain advances.

5. The combination of the bed-plate and platens of an oil-cloth-printing machine, with color-rollers free to be moved vertically toward and from the faces of the printing-blocks carried by the platens, and devices, substantially as described, for bringing the color-rollers up to the printing-blocks as the color-boxes traverse in one direction, and carrying them away from the printing-blocks as the color-boxes traverse in the other direction, all substantially as set forth.

6. The combination of the bed-plate and platens of an oil-cloth-printing machine, having bars M, carrying the color-boxes, reciprocating-bars M', on which the said bars M rest at different heights, and devices, substantially as described, for raising and lowering the upper bar on the lower one, substantially as specified.

7. The combination of the bed-plate and platens of an oil-cloth-printing machine, with bars M, carrying the color-boxes, and having feet  $m$ , reciprocating bars M', having steps  $s s'$  at different heights, and devices, substantially as described, for raising the upper bar from the lower to the upper steps, substantially as set forth.

8. The combination of the bed-plate and



platens of an oil-cloth-printing machine, and bars M, carrying the color-boxes and having cams  $m'$ , with reciprocating bars M', having steps at different heights, on which the bars M and color-boxes can rest, and pins on the frame, with which the cams  $m'$  engage as the bars reach one end of their movement, to raise the bars M and the boxes from the lower to the upper steps.

9. The combination of the bed-plate and platens of an oil-cloth-printing machine, with bars carrying the color-boxes, and having racks R, quadrant-arm 4, geared to the said rack, and the reciprocating cam-bars E, having open jaws to engage with the said quadrant, substantially as described.

10. The combination of the bed-plate and platens of an oil-cloth-printing machine, bars M, carrying the color-boxes and having cams  $m'$ , and bars M', having steps at different heights which carry the said bars M, with spring-pins  $n$ , cam-plates P, and reciprocating bars E, provided with pivoted pawls to operate the plates P, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY A. BOUCHER.

Witnesses:

WILLIAM D. CONNER,  
HUBERT HOWSON.