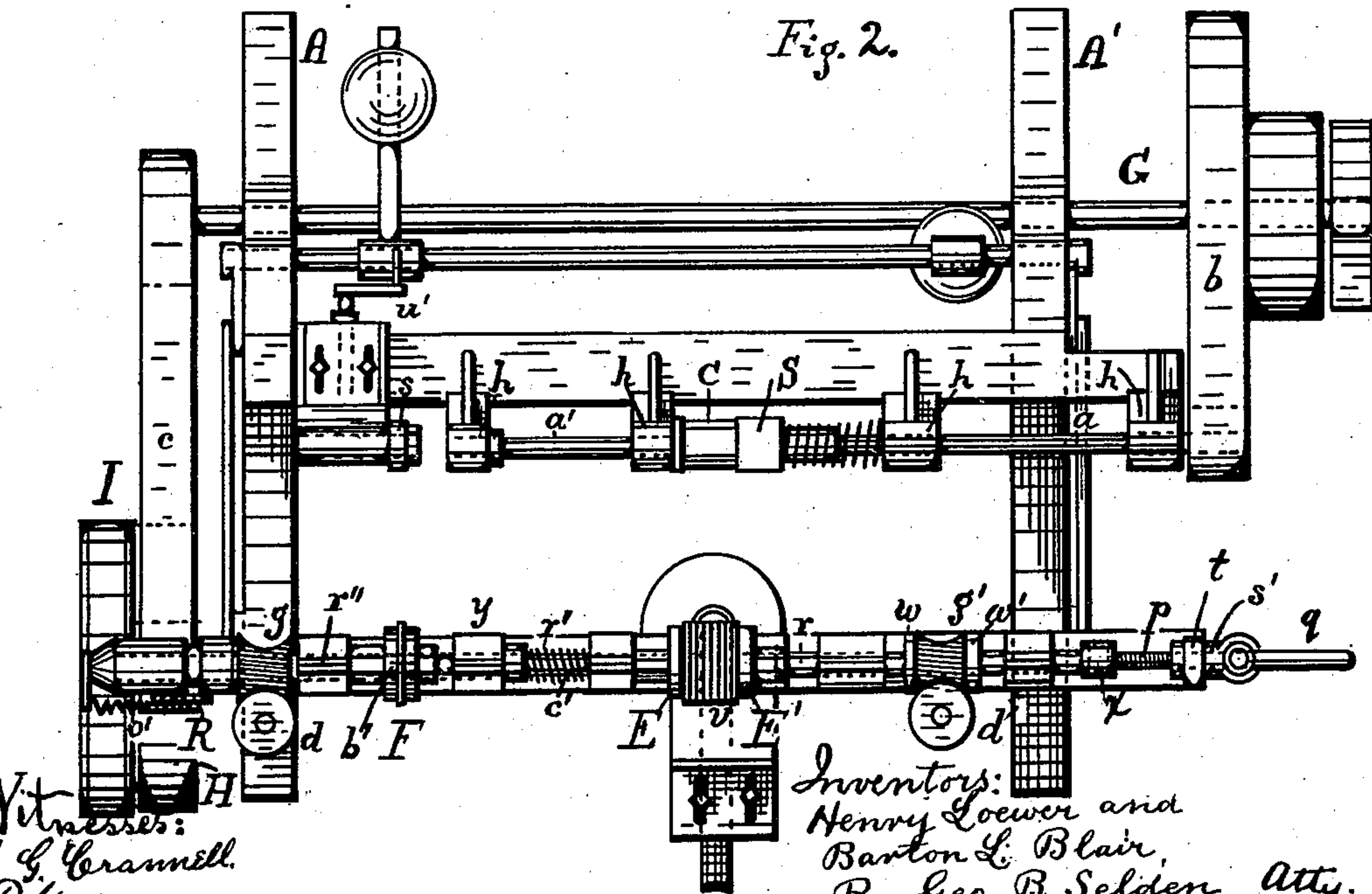


3 Sheets—Sheet 1.

No. 407,735.

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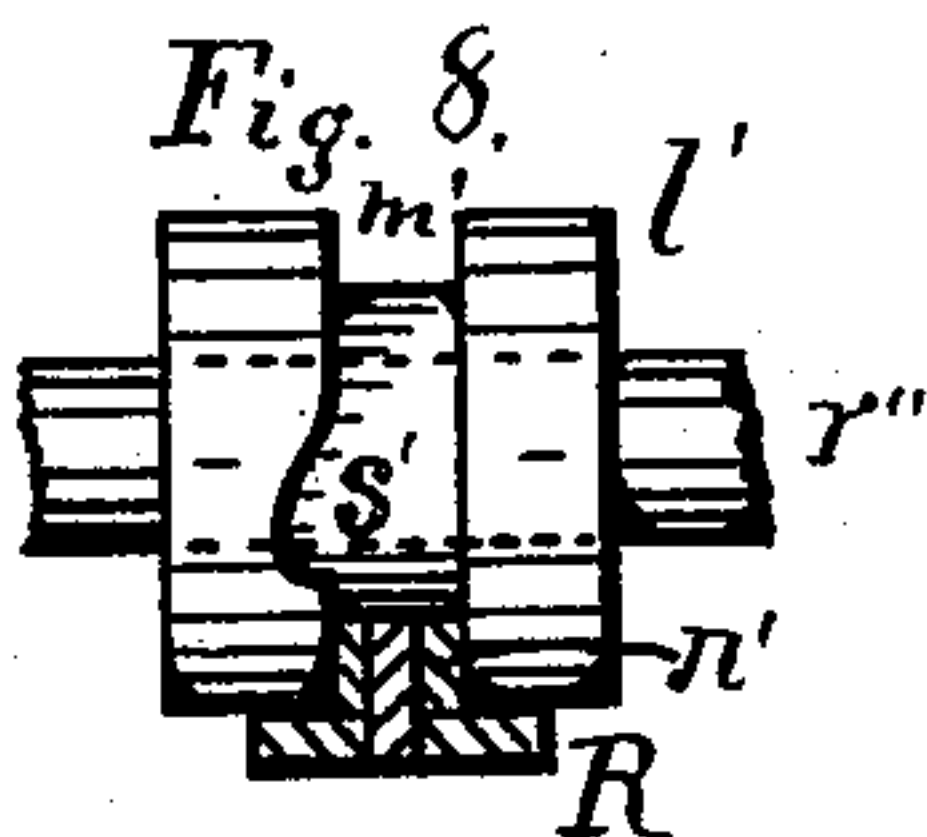
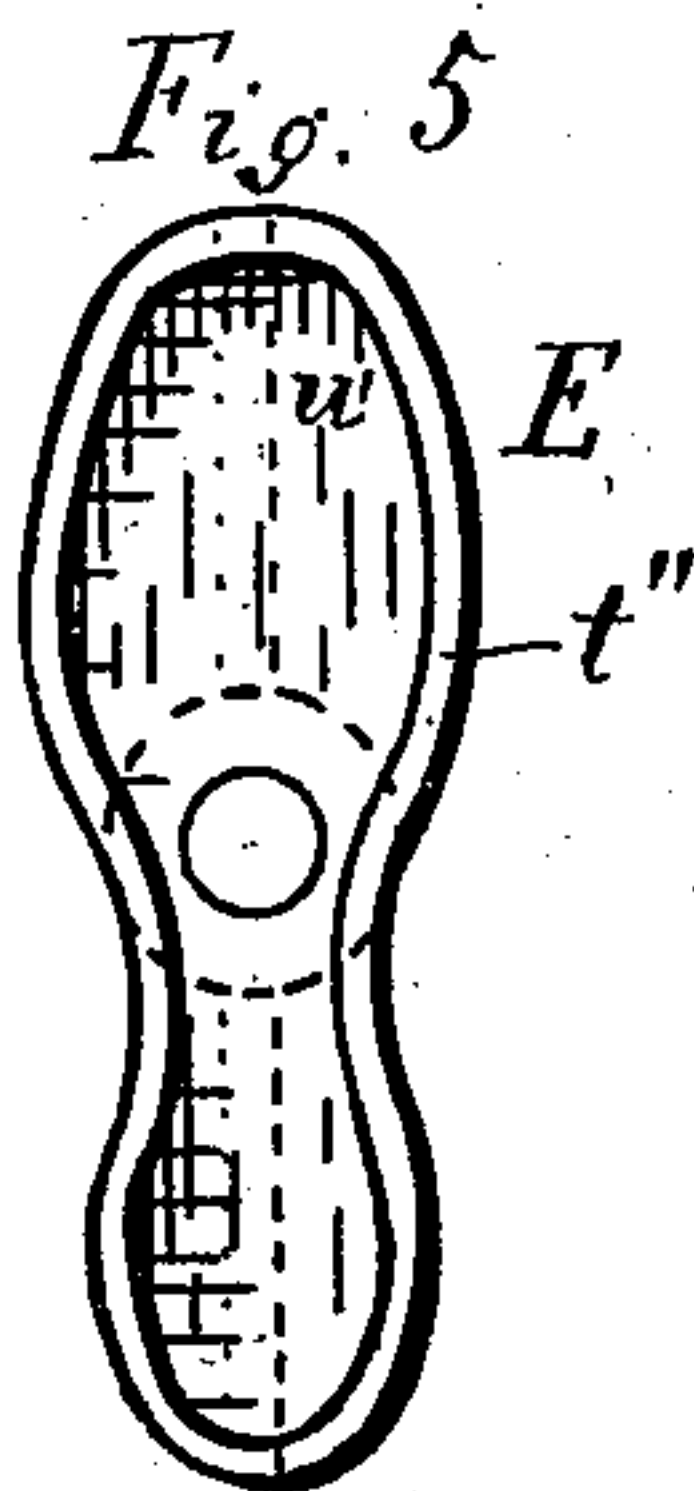
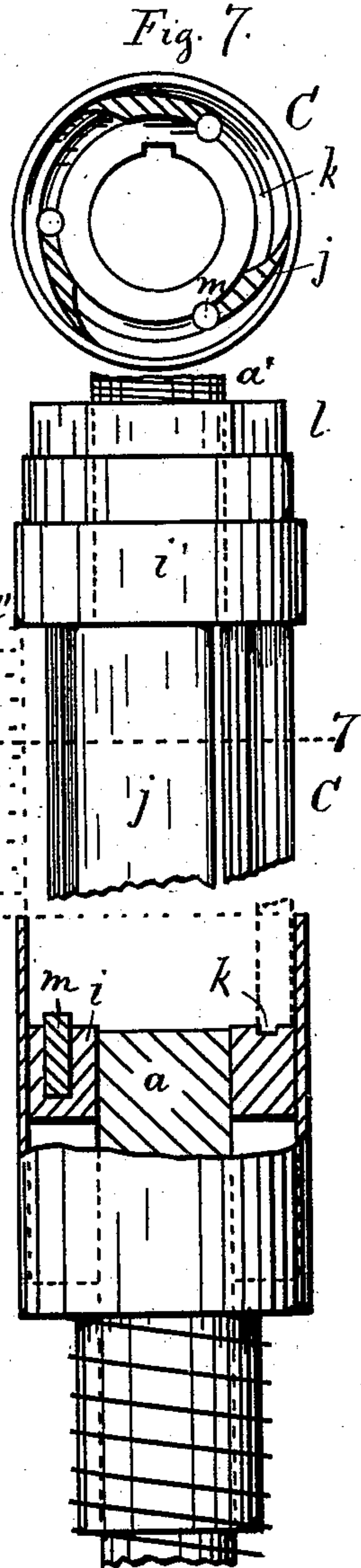


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3 Sheets—Sheet 2.

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(No Model.)

3 Sheets—Sheet 3.

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SOLE CUTTING MACHINE.

No. 407,735.

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Fig. 9.

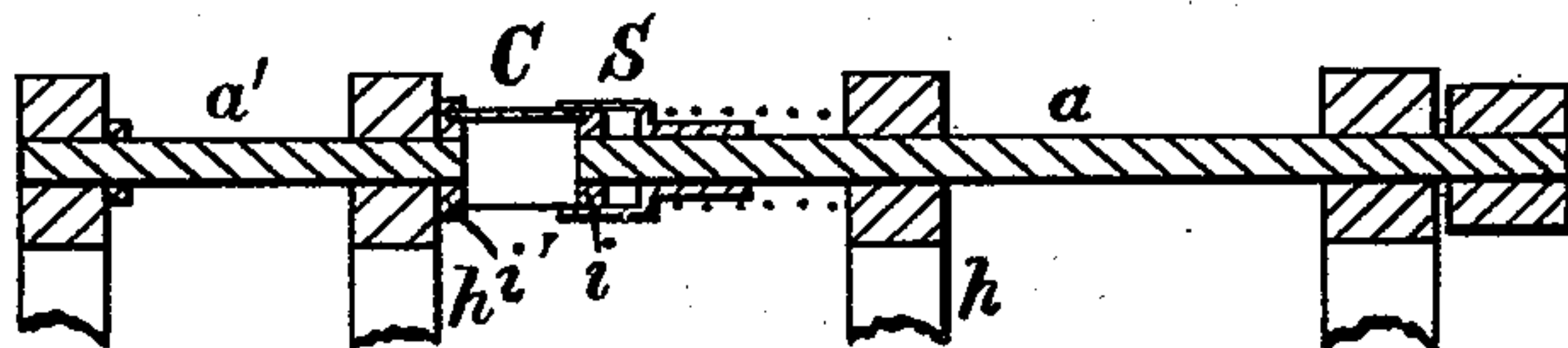
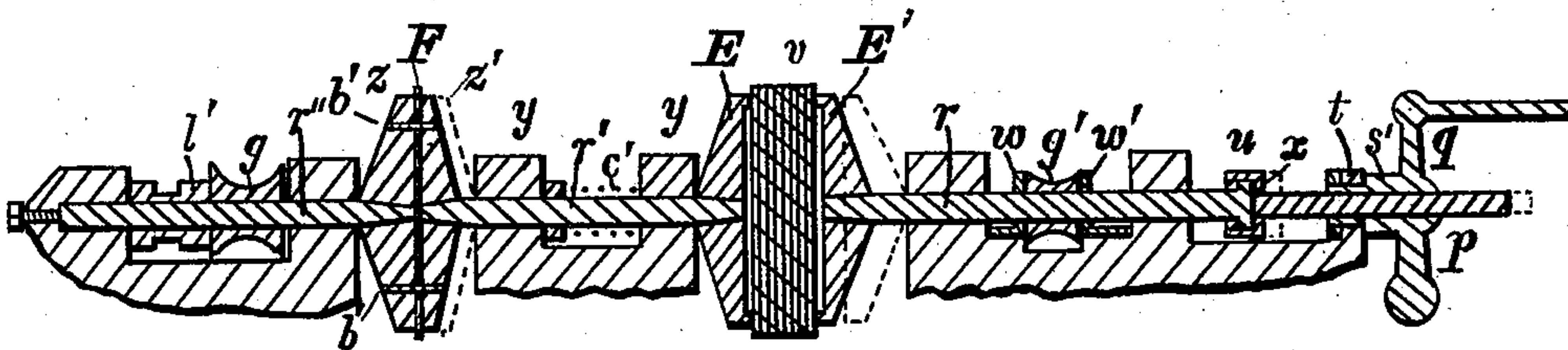


Fig. 10.



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# UNITED STATES PATENT OFFICE.

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## SOLE-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 407,735, dated July 23, 1889.

Application filed March 11, 1889. Serial No. 302,801. (No model.)

*To all whom it may concern:*

Be it known that we, HENRY LOEWER and BARTON L. BLAIR, citizens of the United States, residing at Rochester, in the county of Monroe, in the State of New York, have jointly invented an Improved Sole-Cutting Machine, of which the following is a specification, reference being had to the accompanying drawings.

Our invention relates to an improved sole-cutting machine, which is fully described and illustrated in the following specification and the accompanying drawings, and the novel features thereof specified in the claims annexed to the said specification.

Our improved sole-cutting machine is represented in the accompanying drawings, in which—

Figure 1 is a front elevation. Fig. 2 is a plan view. Fig. 3 is an end elevation of the machine as seen from the right hand in Figs. 1 and 2. Fig. 4 is a longitudinal section through the sole-clamps. Fig. 5 represents the face of one of the clamps. Fig. 6 represents the cutter and sliding cutter-guard. Fig. 7 is a section of the cutter on the line 7 7, Fig. 6. Fig. 8 represents the stopping-cam. Fig. 9 is a longitudinal section through the cutter. Fig. 10 is a longitudinal section through the sole-clamps.

Our improved sole-cutting machine consists, essentially, of a suitable frame-work A A', supporting a revolving cutter C, and the movable carriage or frame D, sustaining the revolving clamping-plates E E', and the revolving pattern or form F, which causes the carriage to travel to and from the cutter, so as to give the blanks held between the clamping-plates the required shape.

G is the main driving-shaft, from which motion is transferred to the cutter-shaft a by means of the belt b, and to the revolving clamps E E' by means of the belt c and f, pulleys H and I, shaft J, bevel-gears e e', worms d d', and worm-gears g g'. The shaft a is supported in suitable journals h h on the horizontal cross-bar, which connects together the upper ends of the standards A A'.

B is another cross-bar lower down. The cutter-shaft is divided in two parts a a', to

the inner ends of which the heads i i', which sustain the knives j, are secured. One of the heads is made removable by means of the nut l, fitting a thread on the cutter-shaft. The ends of the knives are fitted in an annular groove k, Figs. 6 and 7, pins m being inserted in the heads, against which the rear edges of the knives bear.

The frame D swings on the shaft n, its upper end being free to swing to and from the cutter, as indicated by the full and dotted lines D D' in Fig. 3. On one end of the shaft n are placed the pulleys H and I, which revolve together, receiving motion from a pulley on the main driving-shaft G by means of the belt c. Shaft n is supported in suitable journals on the uprights A A'. The shaft J revolves in boxes on the carriage D, and, by means of the bevel-gears e e', transmits motion to the worm-shafts o o', carrying the worms d d'. On the upper part of the carriage, in suitable boxes, is supported the clamp-shaft r r' r'', which receives motion from the worms d d' through the worm-gears g g', so that the form F and the clamps E E' are caused to revolve simultaneously.

The leather to be cut into soles is placed between the clamps E E', one of which, as E', is made movable for the purpose of the insertion and removal of the stock. Provision is also made for clamping the blanks v tightly between the clamps, which, in the construction indicated in the accompanying drawings, is effected by the screw d, Figs. 1 and 2. The lever q is connected with a nut s', which revolves in a suitable journal t in the carriage D, and causes the screw p to slide backward and forward. The inner end of the screw p is connected to the shaft r by a joint u, which permits the shaft to revolve independently of the screw, and still causes the two to move together lengthwise, so that the clamp E' on the inner end of the shaft may be adjusted to and from the opposite clamp E by turning the lever q, and the blanks v can be clamped in place between the plates E E', so as to sustain the action of the knives. The shaft r is splined through the worm-gear g'. The worm-gear is prevented from shifting laterally by the ears w w', Fig. 2, at



tached to the carriage. The inner end of the screw  $p$  is provided with a collar or enlargement  $x$ , fitted with a socket, screwed on the end of the shaft  $r$ .

5 In order to make the pattern or form  $F$  removable from between the plates  $z$   $z'$ , the shaft  $r'$  is made to slide lengthwise through the journals  $y$  when there is no stock in the machine, as indicated by the full and dotted  
10 lines in the figures. One of the plates  $z$   $z'$  is provided with pins  $b'$ , passing through the form  $F$  and entering the other plate, so as to hold the form in place and to cause the plates to revolve together. As indicated in the  
15 drawings, the plate  $z'$  is forced against the plate  $z$  by means of the spring  $c'$  bearing against a collar on the shaft  $r'$ . As the form  $F$  revolves, it bears against the roller  $s$  of the same diameter as the cutter  $C$ , and arranged  
20 with its center in the line of the axis of the shaft  $a$   $a'$ , so that the carriage  $D$  is controlled in its movements to and from the cutter, and the blanks are shaped by the knives into soles of the same form and dimensions  
25 as the pattern  $F$ . The carriage or frame  $D$  is given a tendency to move toward the cutter by means of a counter-weight or a spring. In the arrangement shown in the drawings the counter-weight is applied to the rock-shaft  
30  $O$ , connected with the carriage at each end by arms  $f'$  and links  $h'$ . A balancing-weight  $N'$  can also be employed.

A clutch is provided so that the revolution of the clamps and the former may be stopped  
35 while the cutter is allowed to run. In the arrangement shown in the drawings pulley  $I$  runs loose on the shaft  $J$ , and its hub is provided with suitable clutch-jaws  $j'$ , Fig. 1, which engage with a clutch-collar  $k'$  on the end of  
40 the shaft, when the pulley is shifted laterally by means of the lever  $R$ . In order to provide for the automatic stopping of the clamps and the form when they have made one revolution, a collar  $I'$  is placed on the  
45 shaft  $r''$ , having the groove  $m'$ , Fig. 8, in which a pin or roller  $n'$  on the lever  $R$  travels. The lever is drawn constantly toward the left hand by the spring  $o'$ , and the groove  $m'$  is provided with a notch  $s'$ , into which the pin  
50  $n'$  enters when the clamps have completed their revolution, by which means the clutch  $j'$   $k'$  is disengaged and the motion of the shaft  $J$  stopped.

The roller  $s'$  is made adjustable to and from  
55 the form, so as to compensate for wear. Its position is controlled by means of a slide  $t'$ , arranged to be moved by a lever  $u'$  or other suitable device.

In order to prevent the formation of a rough  
60 edge on the outer side of the outside sole during the cutting operation, the cutter is provided on one side of the blanks with the annular flange or lip  $x'$ , Fig. 6, and on the other side with a sliding collar  $S$ , provided with a  
65 spring, which causes its inner edge to bear on the stock during the cutting operation. This collar revolves with the cutter and the

spring permits its lateral adjustment to suit different thicknesses of stock. The carriage is held from swinging too far away from the  
70 frame  $A$   $A'$  by the link  $Z$ .

The operation of our improved machine will have been already understood from the preceding description.

The cutter having been set in motion, the  
75 operator inserts a number of pieces of leather, cut approximately to the desired shape of the soles, between the clamps  $E$   $E'$ , which are forced firmly together by the screw  $p$ . The carriage is then allowed to move toward the  
80 cutter until the form  $F$  comes in contact with the roller  $s$ , after which the clutch is engaged and the blanks are cut to the required form by the revolving knives, while the clamps and form revolve. As many as eight or ten pairs  
85 of soles may be cut at one operation. The insertion of the blanks between the clamps in proper position is facilitated by the use of the guide  $T$ , which is fixed on the upper end of a rod  $U$ , arranged to be moved up and  
90 down by the treadle  $W$ . The clamps are turned into position with their length arranged horizontally, after which the guide-plate  $T$  is raised up, so that its horizontal surface determines the proper position of the  
95 blank relatively to the clamps in one direction, while its upright portion  $y'$ , Fig. 3, secures the proper position of the blank lengthwise of the clamps. The upright plate  $y'$  is adjustable lengthwise of the horizontal plate  
100  $T$ , and the rod  $U$  is provided with a collar  $p'$ , which determines the position of the plate  $T$  relatively to the clamps when raised up. The collar  $p'$  may be threaded on the shaft. In order to enable the clamps to grip the blank  
105 firmly, they are recessed on their faces, as indicated at  $i$   $i'$ , Figs. 4 and 5, so that the blanks are held by the projecting lip or margin  $l''$ , which runs around the edges of the clamps.

It is obvious that the roller  $s$  might be a  
110 stationary guide for the form  $E$ ; but we prefer to make it revolve, to reduce the friction and wear.

We claim—

1. In a sole-cutting machine, the combination, with the revolving cutter  $C$  and its shaft, of the revolving sole-clamps  $E$   $E'$ , their supporting-shafts, the movable carriage, and a revolving form operating to vary the relative positions of the cutter and the sole-clamps,  
115 substantially as described.

2. In a sole-cutting machine, the combination, with the revolving cutter  $C$  and its shaft, of the revolving and traveling recessed sole-clamps  $E$   $E'$ , form  $F$ , suitable supporting-shafts, and guide  $s$ , substantially as described.  
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3. In a sole-cutting machine, the combination, with the revolving cutter  $C$  and its shaft, of the revolving sole-clamps  $E$   $E'$ , supported on shafts on a suitable traveling carriage, and clamp-screw  $p$ , substantially as described.  
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4. In a sole-cutting machine, the combi-



nation, with the revolving cutter C and its shaft, and guide s, of the revolving sole-clamps E E', clamp-plates z z', removable form F, and suitable supporting-shafts, substantially as described.

5. In a sole-cutting machine, the combination, with the revolving cutter C and its shaft, and guide s, of the revolving and traveling sole-clamps E E', form F, suitable supporting-shafts, and movable blank-guide T, substantially as described.

6. In a sole-cutting machine, the combination, with the revolving cutter C and its shaft, and guide s, of the revolving and traveling sole-clamps E E', suitable supporting-shafts, and movable blank-guide T, provided with adjustable plate y', substantially as described.

7. In a sole-cutting machine, the combination, with the revolving cutter C and its shaft, and guide s, of the revolving and traveling sole-clamps E E', divided shaft r r', screw p, removable form F, and suitable supporting-shafts, substantially as described.

8. In a sole-cutting machine, the combination, with the revolving cutter C and its shaft, and guide s, of the revolving and traveling sole-clamps E E', shafts r r' r'', screw p, clamp-plates z z', removable former F, and suitable supporting-shafts, substantially as described.

9. In a sole-cutting machine, the combination, with the main frame A A', supporting the revolving cutter C and its shaft, and the guide s, of the movable frame D, carrying the revolving sole-clamps E E' and form F, and mechanism adapted to secure the simultaneous revolution of the sole-clamps and the form, substantially as described.

10. In a sole-cutting machine, the combi-

nation, with the cutter C and its shaft, and the guide s, of the movable carriage D, supporting the sole-clamps E E' and form F, divided shafts r r' r'', worms d d', and worm-gears g g', substantially as described.

11. In a sole-cutting machine, the combination, with the cutter C and its shaft, and guide s, of the movable carriage D, supporting sole-clamps E E', clamp-screw p, divided shafts r r' r'', worms d d', and worm-gears g g', substantially as described.

12. In a sole-cutting machine, the combination, with the cutter C and its shaft, and guide s, of the movable carriage D, supporting the revolving sole-clamps E E', divided shafts r r' r'', worms d d', and worm-gears g g', shaft J, bevel-gears e e', clutch j' k', lever R, and cam l', substantially as described.

13. In a sole-cutting machine, the combination, with the main frame A A', supporting the revolving cutter C and its shaft, and the guide s and driving-shaft G, of the swinging frame D, pivoted to the main frame and carrying the revolving sole-clamps E E', divided shafts r r' r'', worms and worm-gears d d' g g', bevel-gears e e', shaft J, and pulleys I H L, substantially as described.

14. In a sole-cutting machine, the combination, with the revolving cutter C and its shaft, provided with the spring-guard S, of the guide s, and the revolving sole-clamps E E', form F, and suitable supporting-shafts, substantially as described.

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