

(No Model.)

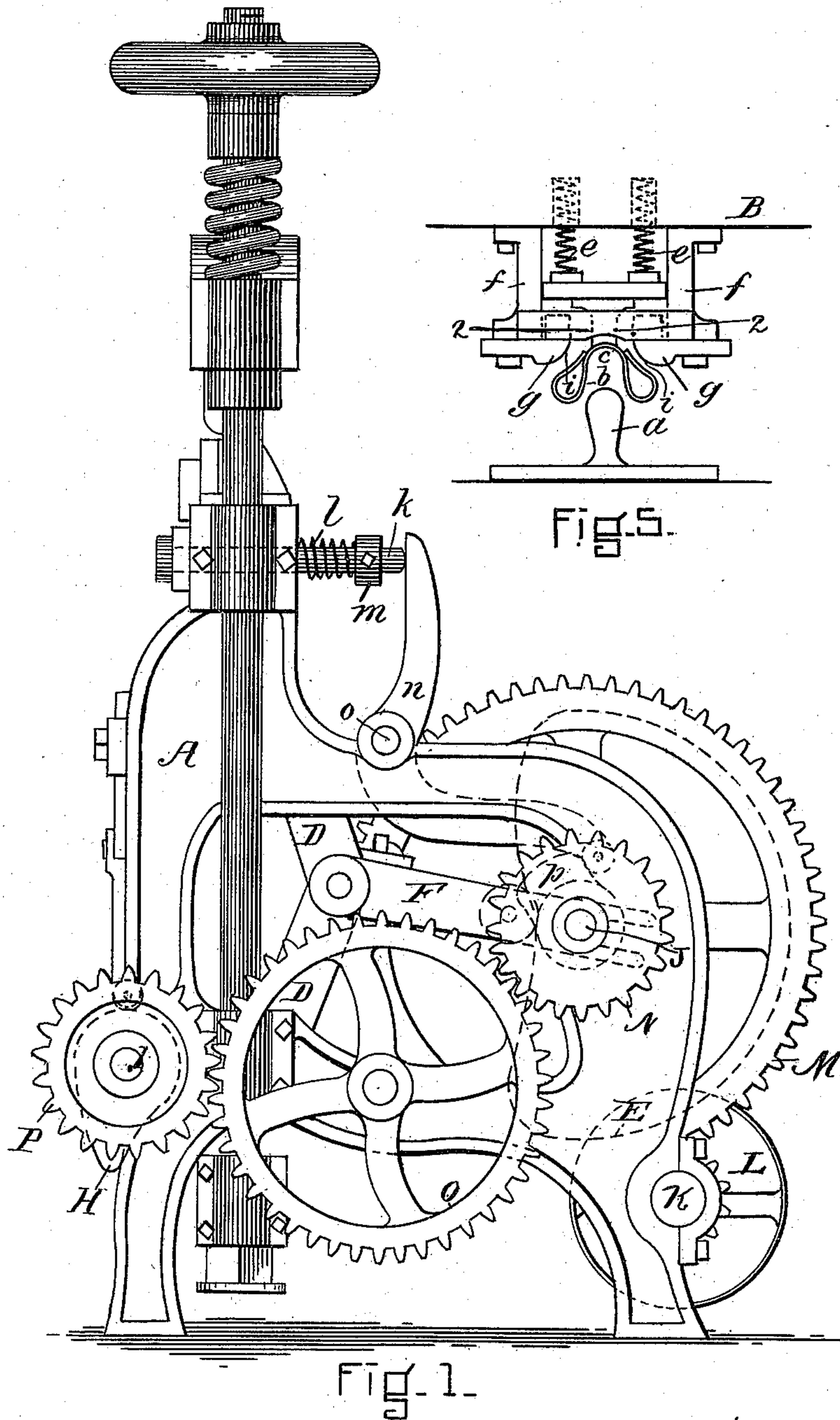
2 Sheets—Sheet 1.

G. A. KNOX.

MACHINE FOR MOLDING HEEL STIFFENERS FOR BOOTS OR SHOES.

No. 383,580.

Patented May 29, 1888.



WITNESSES.

H. Brown.

Chas. Spaulding.

INVENTOR.

G. A. Knox.

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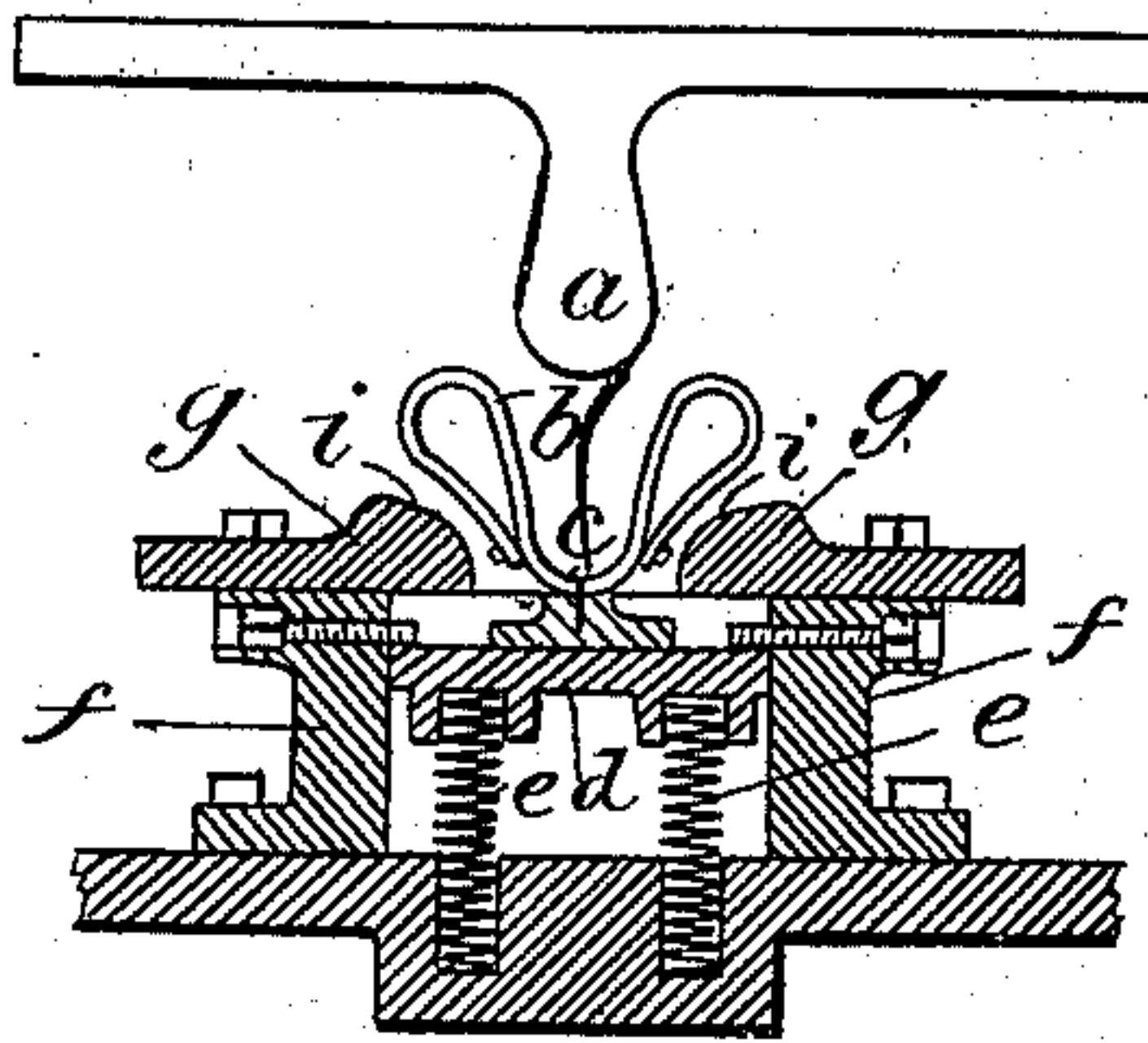
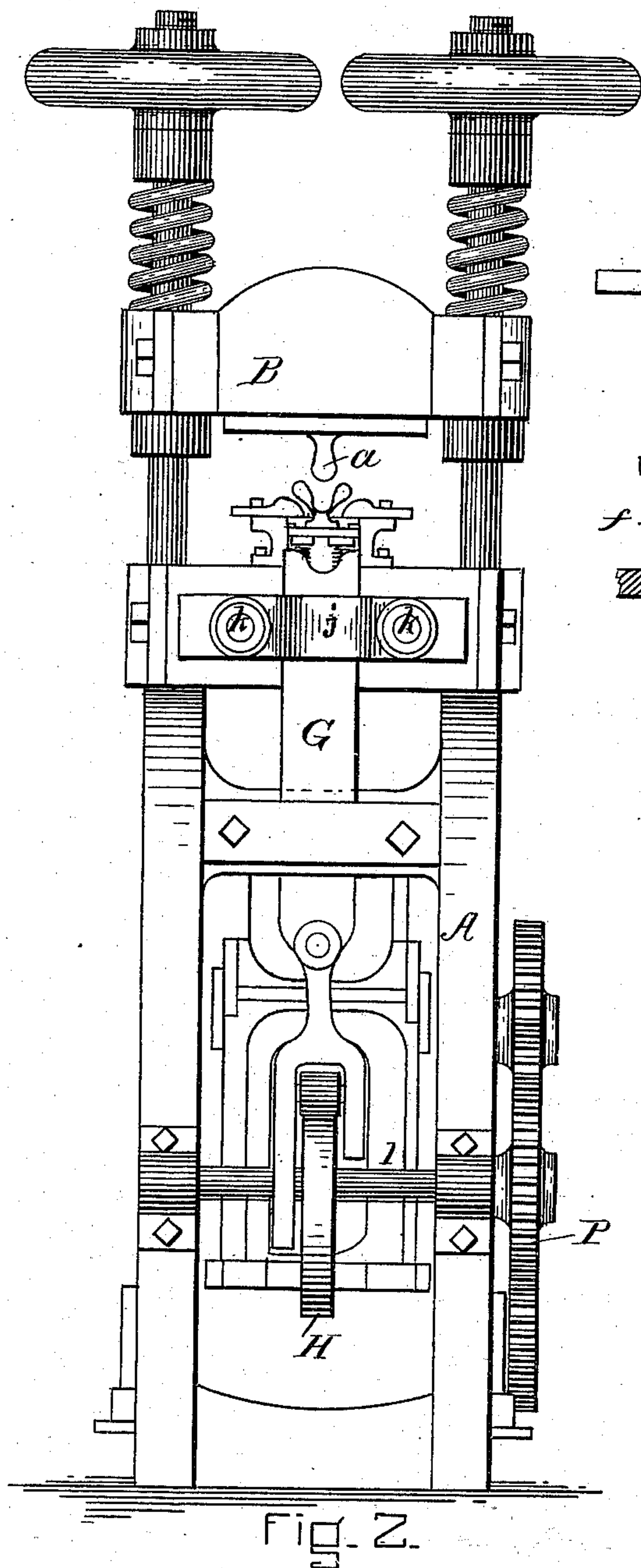


Fig. 3.

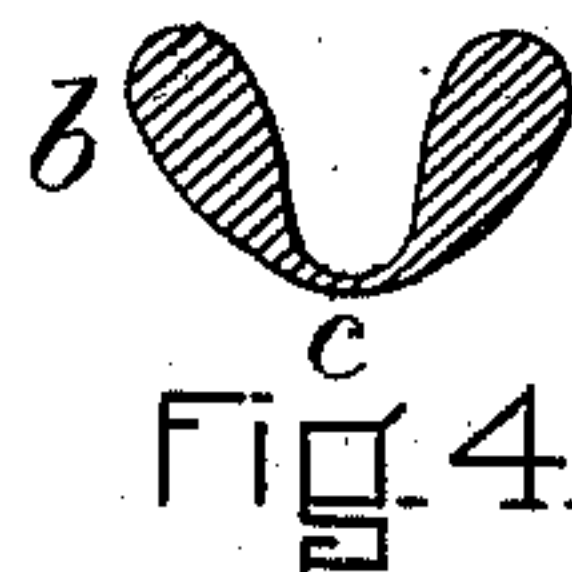


Fig. 4.

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UNITED STATES PATENT OFFICE.

GEORGE ALFRED KNOX, OF LYNN, MASSACHUSETTS.

MACHINE FOR MOLDING HEEL-STIFFENERS FOR BOOTS OR SHOES.

SPECIFICATION forming part of Letters Patent No. 383,580, dated May 29, 1888.

Application filed July 5, 1887. Serial No. 243,369. (No model.)

To all whom it may concern:

Be it known that I, GEORGE ALFRED KNOX, of Lynn, in the county of Essex and State of Massachusetts, have invented certain new and
5 useful Improvements in Machines for the Manufacture of Heel or Counter Stiffeners for Boots or Shoes, of which the following is a specification.

My invention relates to machines for the
10 manufacture of heel or counter stiffeners for boots and shoes.

It is the object of my improvements to provide a machine which shall be certain and efficient in its operation, molding a stiffener so
15 that it shall exactly fit or conform to the form of the shoe or last to which it is applied, and entirely avoid any "buckling" of the flange at the rear or bow point thereof.

I will now proceed to describe my improvements, reference being had to the accompanying drawings, and to the letters of reference marked thereon, forming a part of this specification, the same letters indicating the same parts wherever they occur, of which drawings—
25

Figure 1 represents a side elevation of a machine embodying my improvements. Fig. 2 is a front elevation of the same. Fig. 3 is a sectional detail view designed to clearly illustrate the construction of the molds and the support for the lower or female mold. Fig. 4 is a sectional view of a modified form of the female mold. Fig. 5 represents another modification.

My improvements are for the most part confined to the lower or female mold or die and its adjuncts and means for operating and controlling the operations of the slide, whereby the latter is held with a powerful though yielding
40 force against the counter or stiffener when said slide moves upward or forward to set or lay the flange, and released as it moves downward or off the stiffener, so as not to "drag" on the flange and damage the work done by it.

The general design of the machine and the means and manner of effecting the reciprocations of the cross-head and of the flange-setting slide may be the same as are shown and described in Letters Patent No. 365,608, granted
50 to me June 28, 1886, to which reference may be had.

In the drawings, A represents the frame of

the machine; B, the reciprocating cross-head; C, the rods attached to the cross-head, and by which it is drawn down; D, the toggle-levers
55 for drawing down the rods, said toggle-levers being operated by a cam, E, (shown in dotted lines in Fig. 1,) through the medium of arm F; and G, the reciprocating flange-forming slide, operated by a cam, H, on shaft I. 60

Cam E is secured to cam-shaft J, which shaft is operated from main shaft K through the medium of gears L M. Shaft I is driven from cam-shaft J through the medium of gears N
65 O P.

This description is regarded as sufficient, particularly in view of my before-mentioned patent, to give a clear understanding of the construction and operations of the various parts of the machine mentioned. 70

a designates the male mold or die, secured to the cross-head B, as usual. As shown, the neck of mold *a* is made somewhat narrower than the lower or body part, this form being for the purpose of securing the molding or shaping of
75 the stiffener to exactly fit the shoe to which it is to be applied.

b designates the lower or female mold or die, which is of a flexible nature, being constructed at its bow-point *c* as a spring. The sides of
80 the female die may be made flexible or yielding also, as represented in Figs. 1 and 3, by a return-bend of the strip or bar of metal composing said mold, or the sides of the mold may be made solid, as represented in cross-section
85 in Fig. 4. This mold *b* is mounted on a bed, *d*, supported on strong springs *e*, the bed *d* being guided in the limited vertical movement that it is permitted to have by the frame *f*. Secured to the frame *f* on each side of mold *b*
90 are two adjustable cam-blocks, *g g*, the rounded faces *i* of which are adapted to engage with the outer faces of the sides of the mold as the latter is depressed, and presses said sides inward against the sides of the neck of the male
95 mold *a*, and so mold the stiffener placed in the molds to conform to the form of the male mold.

By forming the sides of the female mold solid, as shown in Fig. 4, or connecting the return-bend with the inner wall of the mold
100 where the sides of the same are made flexible, as in Figs. 3 and 5, the sides of the female mold from the bow-point *c* to the top are pressed with uniform force against the sides

of the male mold and the interposed stiffener being operated upon, which would not be the case if the sides of the female mold were pressed inward by springs or spring-arms connected to said mold only at the top thereof. In the latter case the major amount of the lateral pressure on the sides of the mold would be on the upper end thereof and against the sides of the neck of the male mold.

It is important that the pressure on the stiffener should be equal at all points in order to effect perfect molding and an exact and perfect "setting" or laying of the flange.

In the operation of my machine a stiffener, having received preparatory molding in another and separate machine or not, is placed in position on the female mold *b* and the male mold *a* descends, pressing the female mold and its bed downwardly against the stress of the springs *e* and bringing the sides of the mold in contact with the cam-blocks *g*, pressing said sides inward against the sides and neck of the male mold, effectually molding the stiffener to conform to the form of the male mold, which form is that of the boot or shoe to which the stiffener is to be applied. While the stiffener is held clamped between the molds the slide *G* is raised by the action of cam *H*, as described, and the projecting edge laid or ironed down as a flange on the stiffener. The slide is guided in its vertical movements and held pressed against the face of the molds with a yielding pressure by means of a cross-bar, *j*, secured to the machine-frame by means of a bolt, *k*, secured to said bar and passing through and beyond the frame, having springs *l* surrounding the projecting ends between the frame and an adjustable nut, *m*, thereon. To prevent the slide on its downward movement from dragging on the set-flange and damaging the same, I have provided levers *n*, fulcrumed at *o* to the frame, resting at their upper ends against the rear ends of the bolts *k* and at their lower ends on a cam, *p*, (shown only in dotted lines in Fig. 1,) secured on cam-shaft *J*. This lever *n* is operated by a cam, *p*, at the moment the slide starts on its return or downward movement to press bolts *k* forward against the stress of springs *l*, and so relieve the slide of all pressure against the face of the dies or molds, and so prevent it from dragging down on and injuring the set-flange.

Various changes may be made in the form and arrangement of parts comprising my invention without departing from its nature or spirit.

In the modification shown in Fig. 5 the cam-blocks *g* are extended downwardly and have parallel vertical pieces 2 2, which hold the sides of the flexible female mold against the stiffener, and the flexible mold is placed over the male mold, the former being movable and the latter fixed. When the flexible mold is depressed, its sides are pressed inwardly by the blocks *g g* and held pressed inwardly by the extensions 2 2 of said blocks while the mold is being still further depressed for the

purpose of having the flange formed on it. By the term "flexible mold" as herein employed I mean to be understood as defining a mold constructed as a single piece or part and practically flexible—that is, capable of being bent from one position to another and when released of springing back by its own resilient properties to its normal position—in contradistinction to practically rigid molds and what are known in the art as "divided" molds—that is, molds to all intents and purposes rigid and constructed in two parts hinged together.

I am aware that it is not new to employ flexible straps for holding the counter or stiffener on one of the molds while the lip or flange on the stiffener is being set or formed or crimped, the molding of the stiffener so as to fit around the heel being accomplished by separate means, and I therefore do not broadly claim any such means or devices.

What I claim is—

1. In the machine herein described for molding stiffeners for boots and shoes, a reciprocating male mold, a flexible female mold, *b*, a yielding bed for the latter, and cam-blocks *g* to engage the sides of the flexible female mold to press its sides inward or laterally as it yields on its bed to the pressure of the male mold, all combined and operating substantially as and for the purpose set forth.

2. The herein-described mold for molding counters or stiffeners for boots and shoes, having rigid sides and being flexible at its bow-point *c*, substantially as set forth.

3. In the machine herein described for molding stiffeners for boots and shoes, the molds, a reciprocating slide for ironing down and setting the flange, mechanism, substantially as set forth, for holding the slide with a yielding pressure against the face of the dies as the slide is moved to set the flange, and mechanism, substantially as described, for relieving the slide of such pressure as it is moved backward after having set the flange, all combined and operating substantially as and for the purpose set forth.

4. In the machine herein described for molding counters or stiffeners for boots and shoes, a male mold, a female mold having practically rigid sides flexibly connected at the bow-point, a yielding bed for the female mold, and cam-blocks to engage the sides of the female mold to press its sides inward or laterally as it yields on its bed to the pressure of the male mold, all combined and operating substantially as and for the purposes hereinbefore set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 29th day of June, A. D. 1887.

GEORGE ALFRED KNOX.

Witnesses:

ARTHUR W. CROSSLEY,
C. F. BROWN.