

(No Model.)

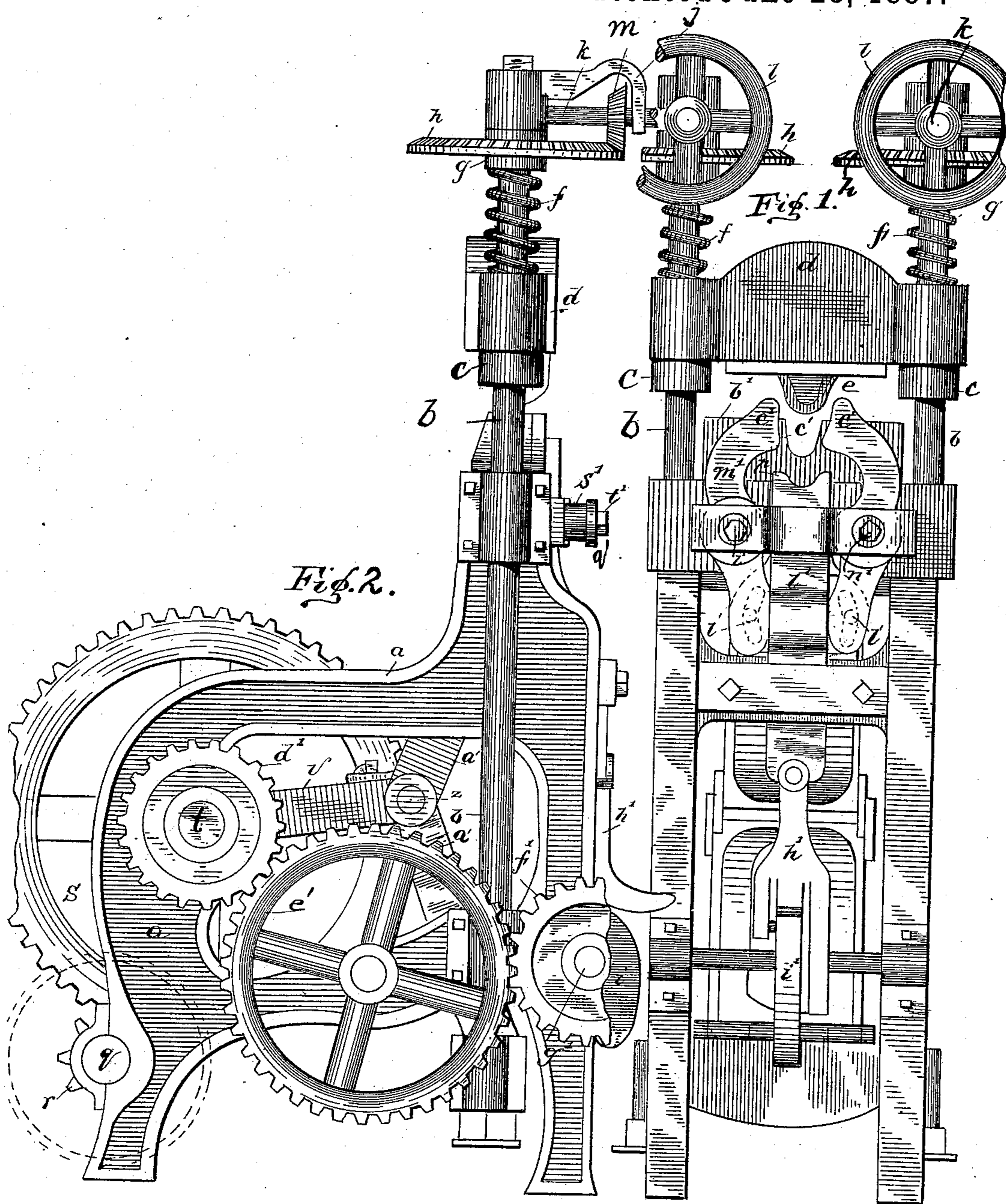
3 Sheets—Sheet 1.

G. A. KNOX.

PROCESS OF AND MEANS FOR MOLDING HEEL STIFFENERS FOR
BOOTS OR SHOES.

No. 365,608.

Patented June 28, 1887.



Attest:
L. H. H. Brown.
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(No Model.)

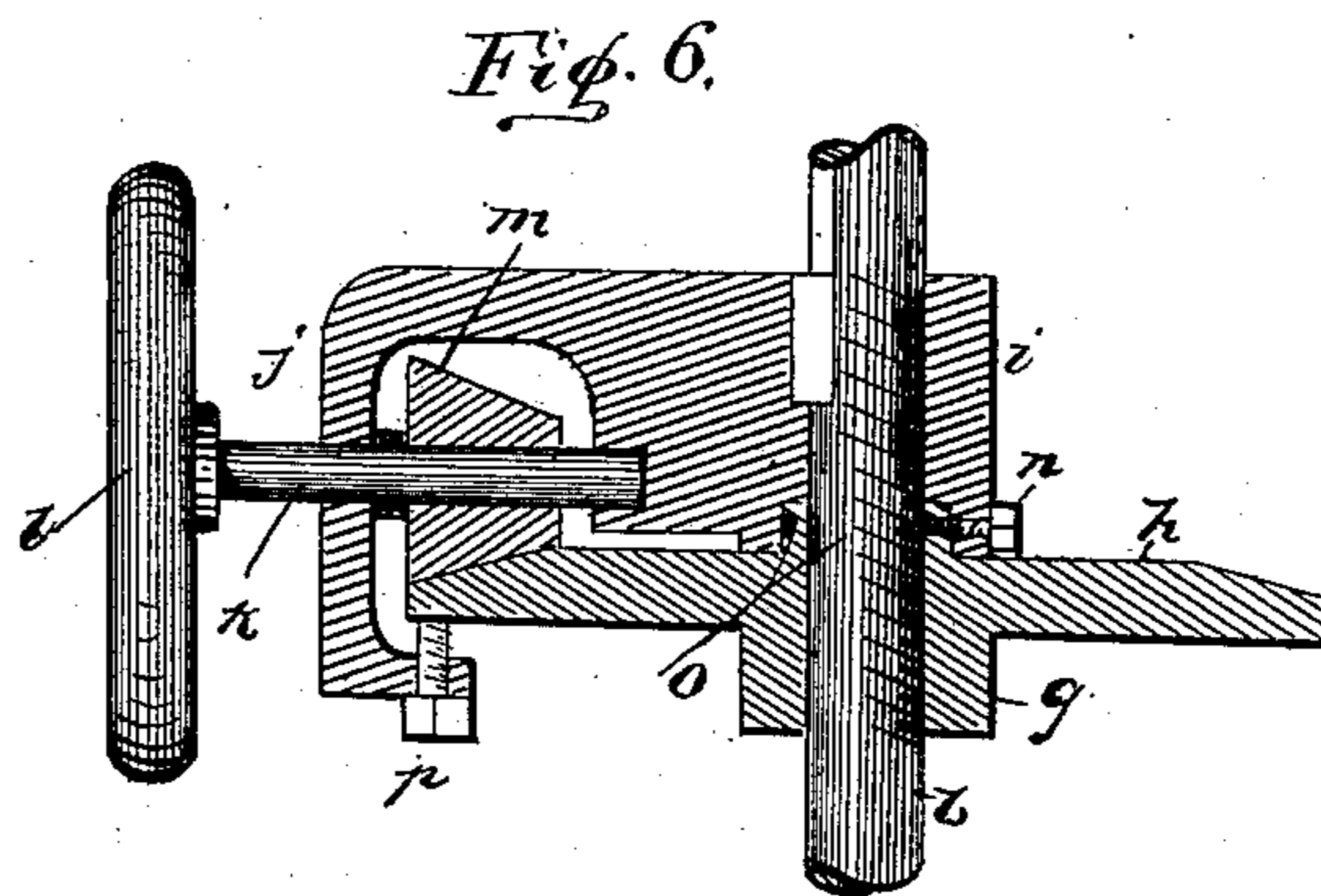
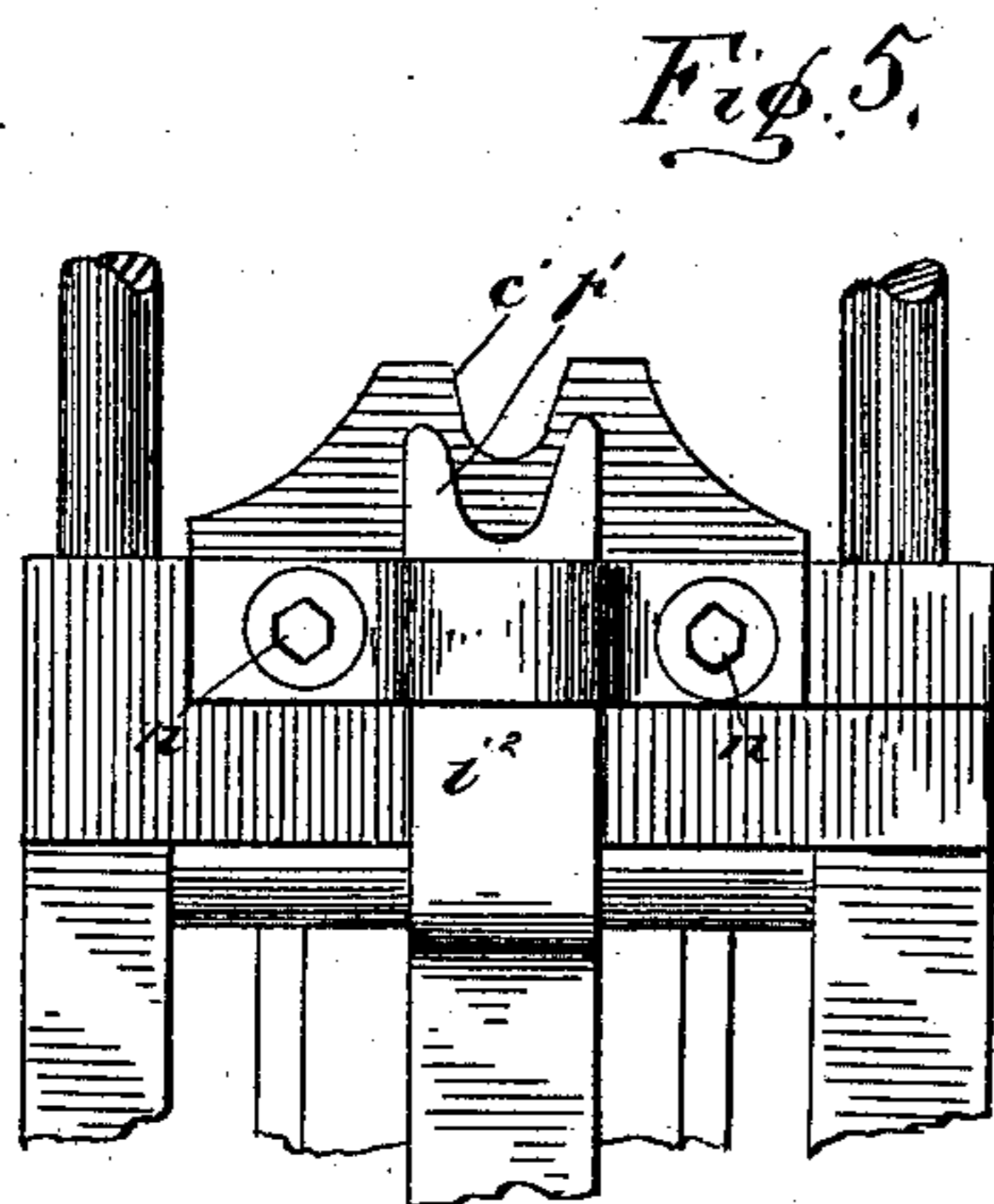
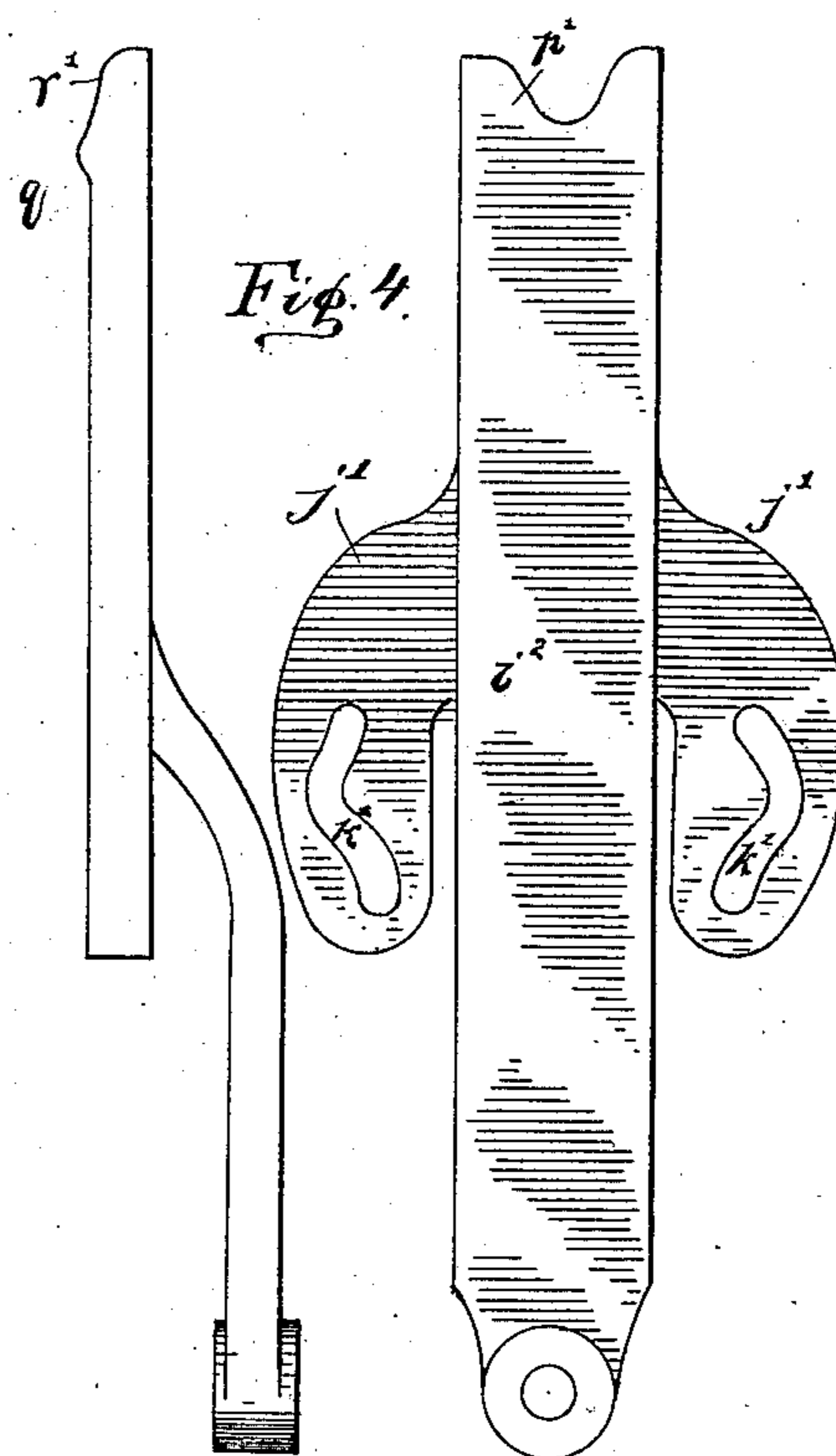
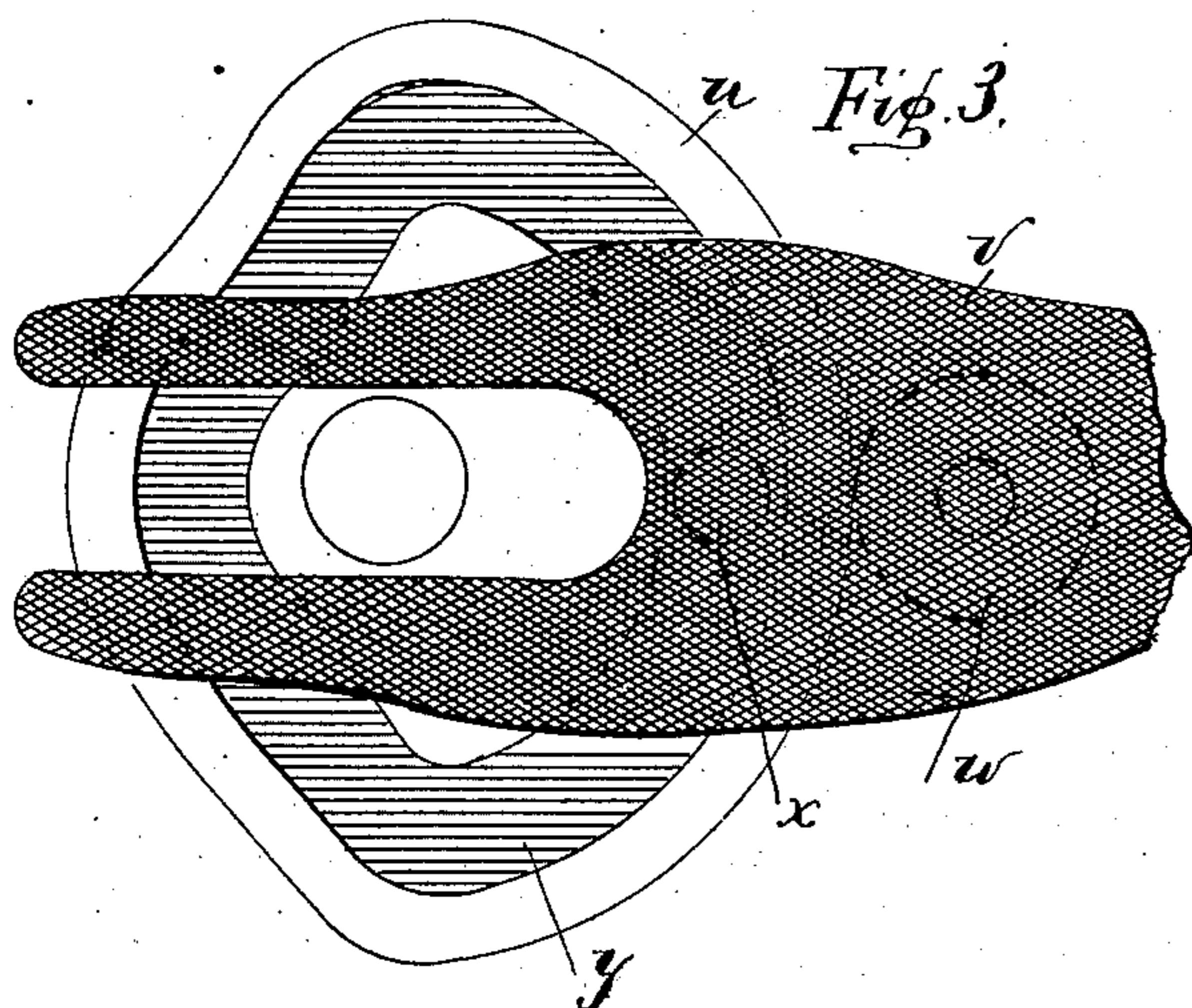
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PROCESS OF AND MEANS FOR MOLDING HEEL STIFFENERS FOR BOOTS OR SHOES.

No. 365,608.

Patented June 28, 1887.



Attest:
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(No Model.)

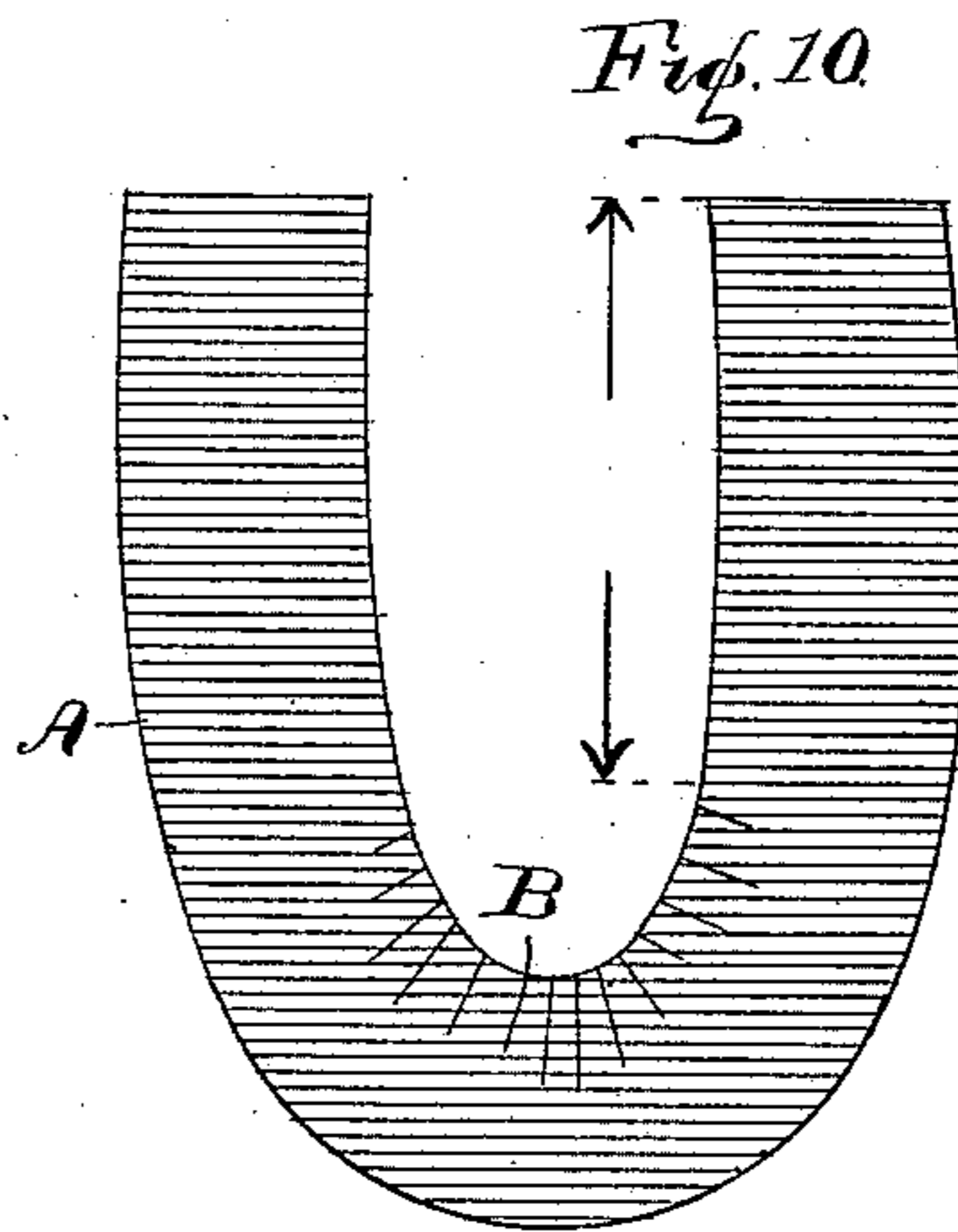
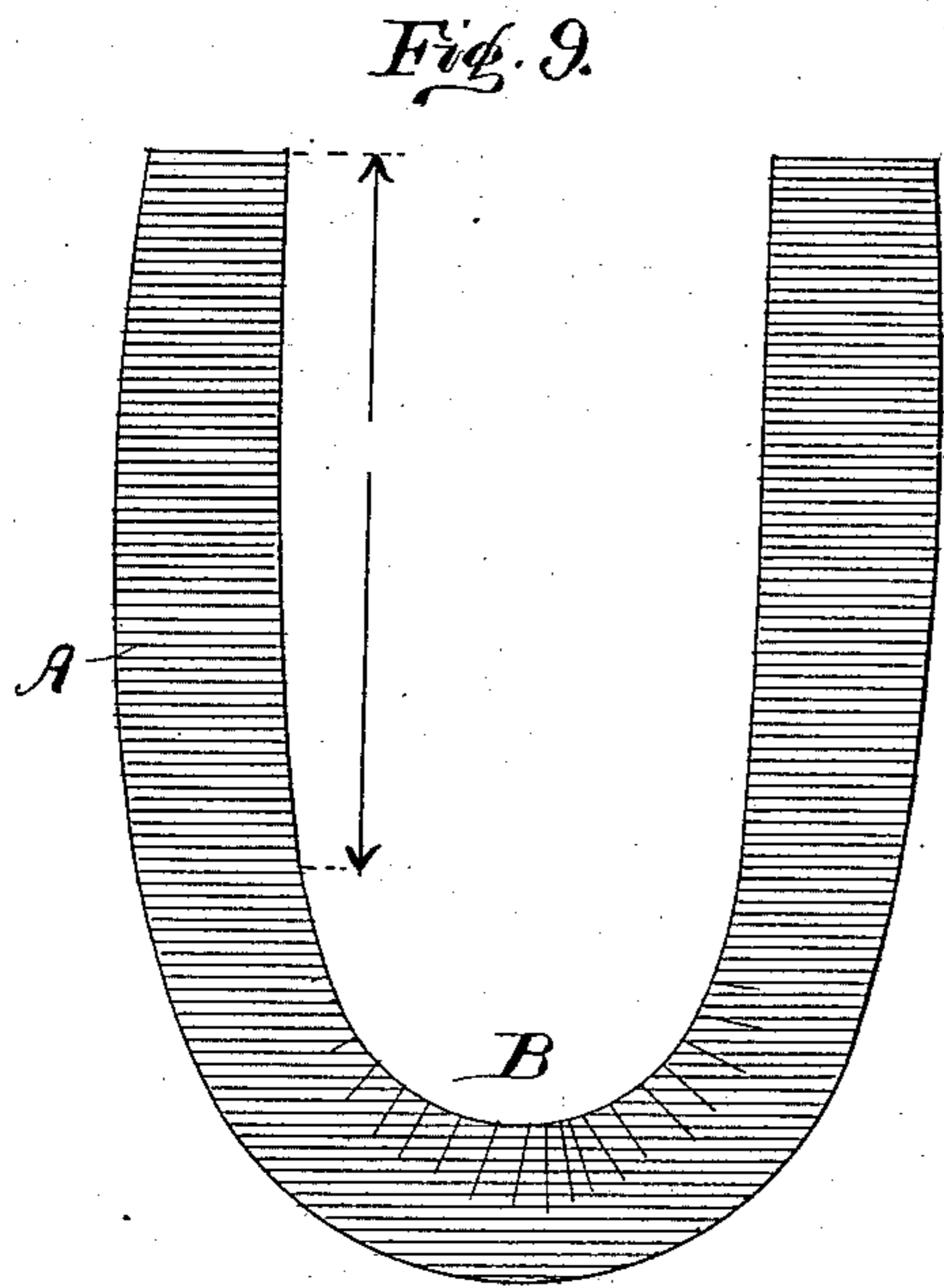
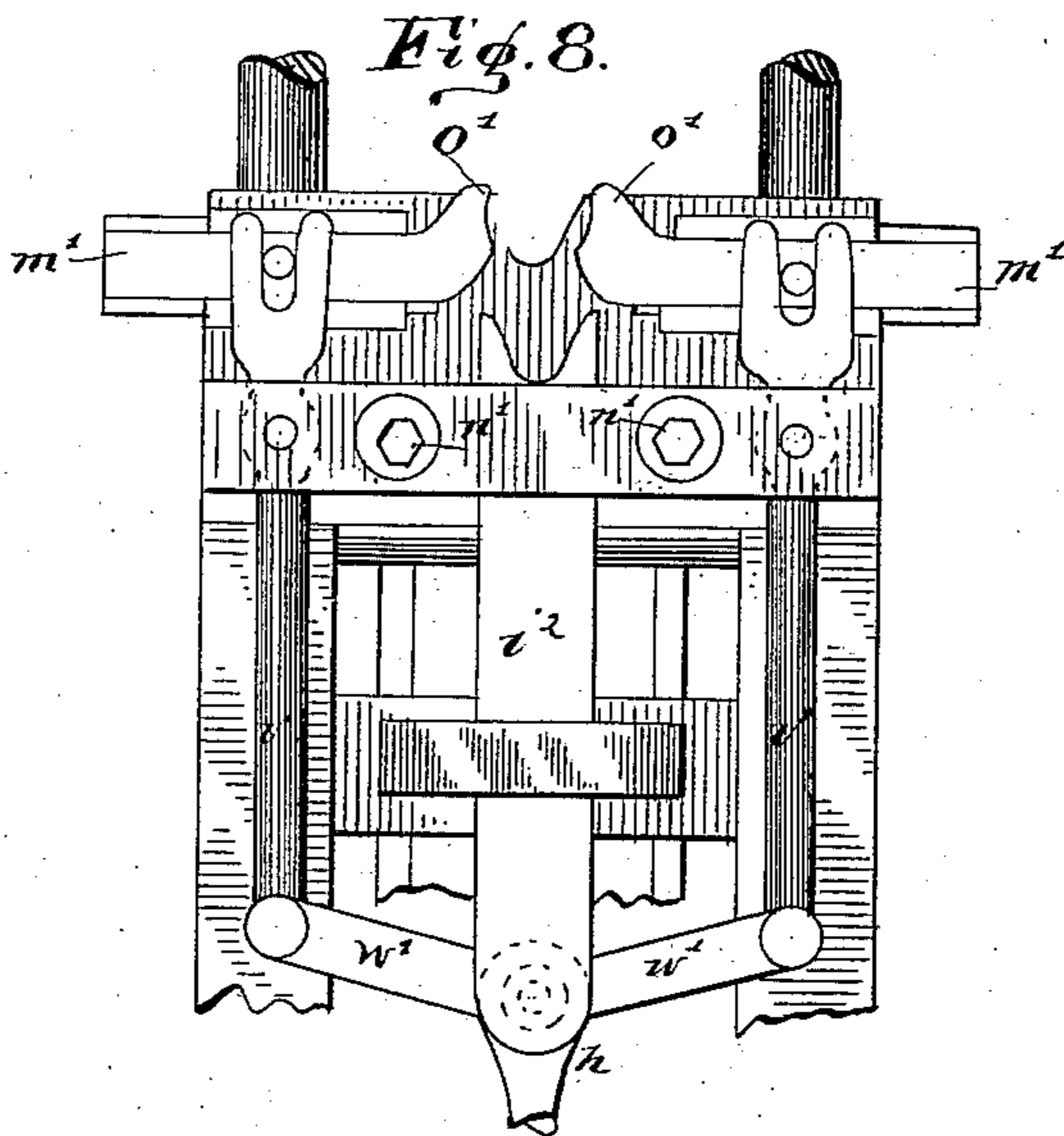
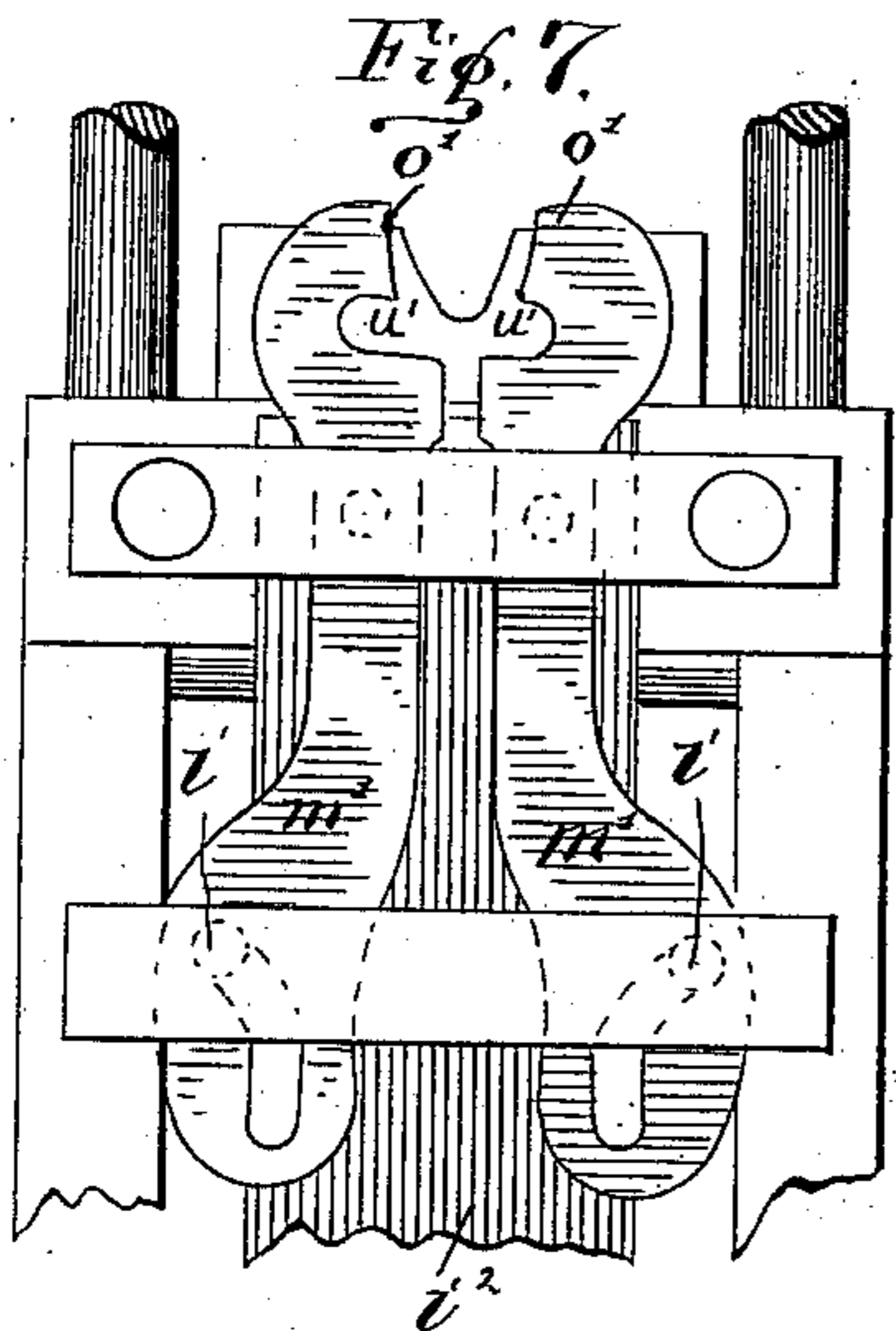
3 Sheets—Sheet 3.

G. A. KNOX.

PROCESS OF AND MEANS FOR MOLDING HEEL STIFFENERS FOR
BOOTS OR SHOES.

No. 365,608.

Patented June 28, 1887.



Attest:
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UNITED STATES PATENT OFFICE.

GEORGE ALFRED KNOX, OF LYNN, MASSACHUSETTS.

PROCESS OF AND MEANS FOR MOLDING HEEL-STIFFENERS FOR BOOTS OR SHOES.

SPECIFICATION forming part of Letters Patent No. 365,608, dated June 28, 1887.

Application filed February 8, 1887. Serial No. 226,991. (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 Process of and Means for Molding Stiffeners or Counters for Boots or Shoes, of which the following is a specification.

My invention has relation to machines for
10 molding stiffeners or counters used in the manufacture of boots and shoes.

The invention has for its object to provide a machine which shall be simple in construction and operation, durable in use, and more
15 powerful than any other of a similar character now known to me; to provide means whereby the pressure may be made variable, and at the same time adjustable to meet varying thicknesses or characters of work; to provide
20 for the use exclusively of solid dies or forms for accomplishing the molding; to provide means whereby the forms or dies and means for adjusting the same may be easy of access to the operator; to so arrange the forms or
25 dies with respect to other parts of the machine as that they may permit the operator to readily place and arrange the stiffeners in the forms to insure the proper formation of the flange thereon; and, finally, to provide a new mode
30 of molding a stiffener and forming the flange thereon.

To these ends my invention consists in the improvements which I will now proceed to describe and claim, reference being had to the
35 accompanying drawings, and to the letters of reference marked thereon, forming a part of this specification, in which drawings—

Figure 1 represents a front view of the machine, parts being shown as broken away. Fig.
40 2 is a side view of the same, parts being shown as broken away. Fig. 3 is a side view of the cam on the main shaft for operating the toggle-levers, hereinafter referred to, a portion of the link connecting the cam with the toggle-
45 levers being also shown. Fig. 4 represents side and edge views of the flange-forming slide. Fig. 5 is a fragmentary view representing a modified form of slide. Fig. 6 is a detail sectional view representing the means for
50 adjusting the tension on the springs bearing down on the cross-head. Figs. 7 and 8 are

respectively modified forms of means for forming flanges on the stiffeners. Figs. 9 and 10 represent bottom plan views of stiffeners of two different sizes.

The same letters of reference indicate the same parts in all of the views.

In carrying out my invention I construct a frame, *a*, of suitable dimensions and strength, and secure thereto at each side thereof a ver-
60 tically-arranged rod, *b*. Collars *c*, having a screw-threaded connection with said rods to permit them to be adjusted thereon, constitute a rest for the cross-head *d*, carrying the male mold or former *e*. Springs *f*, surround-
65 ing rods *b* above the cross-head, and bearing thereon at their lower ends, and at their upper ends against the hub *g* of a gear-wheel, *h*, serve to hold the cross-head down upon col-
70 lars *c* with a yielding pressure.

Gear-wheels *h* have a screw-threaded connection with rods *b*, in order to enable them to be regulated or adjusted thereon to adjust the tension on springs *f*; and as a means for accom-
75 plishing the turning of the wheels *h*, I provide a collar, *i*, splined upon, or having a feather-and-groove connection with rods *b*, so as to move longitudinally, but not turn, thereon, which collar *i* is provided with an outwardly and downwardly extending arm, *j*, in which is
80 journaled a shaft, *k*, provided on its outer or forward end with a hand-wheel, *l*, the inner end of said shaft *k* having a bearing in collar *i*.

Between collar *i* and its arm *j* shaft *k* is provided with a bevel-gear, *m*, engaging gear *h*.
85 A pin or screw, *n*, extends through collar *i* into a groove formed in an upwardly-extending hub, *o*, of wheel *h*, whereby said wheel, collar *i*, gear-wheel *m*, and their associated de-
90 vices may be maintained in proper relative position, all as clearly shown in Fig. 6.

It will be seen that by turning hand-wheel *l* gear-wheel *h* will be turned, and the tension with which springs *h* bear on cross-head *d* ad-
95 justed with great ease and nicety. A set-screw, *p*, passing through a portion of arm *j*, and adapted to abut or join against gear-wheel *h*, affords means whereby said wheel may be held from being accidentally turned when once the
100 adjustment on springs *f* has been regulated to suit the work in hand.

q indicates the main shaft driven by a belt

(not shown) on a pulley represented by dotted lines in Fig. 2. A pinion, *r*, on the main shaft intermeshes with a large gear-wheel, *s*, secured to cam-shaft *t*, to which is affixed a cam, *u*.
 5 (See Fig. 3.) A link-lever, *v*, forked at its rear end so as to straddle shaft *t*, is provided on one side with a roller or bowl, *w*, adapted to roll on the face of cam *u*, and with a pin or roller, *x*, extending into a groove, *y*, formed
 10 in the side of said cam, whereby said link-lever is given a particular movement, for a purpose to be presently explained.

a' a' indicate toggle-levers connected at *z* with link-lever *v*, and pivoted or similarly connected at their upper end to the frame of the
 15 machine and at their lower end to the rods *b*, with which the cross-head *d* is connected, so that they may draw down said rods and cross-head at the proper times, for the purposes
 20 hereinafter explained.

c' indicates the female mold or former, of converse shape to die or former *c*, the two being of such form as to properly mold a stiffener-blank placed therebetween to fit around the
 25 last of a boot or shoe.

d' indicates a gear-wheel on cam-shaft *t*, which gear meshes with arm-idler *e'*, the latter in turn engaging with a gear, *f'*, similar to gear *d'* on cam-shaft *g'*, having its bearings in
 30 front of the machine. A lever, *h'*, is connected at its lower end with a cam, *i'*, on shaft *g'* in a manner similar to that which has just been described with reference to link *v* and cam *u*,
 35 and therefore need not be further explained herein. Lever *h'* is pivoted or otherwise suitably connected at its upper end with a flange-forming slide, *i²*, having suitable guide-bearings in the frame and on the bed *b'*. Said
 40 flange-forming slide has wings or extensions *j'*, *j'*, extending outwardly and downwardly from its sides, in which are formed cam-slots *k' k'*, adapted to receive pins *l' l'*, projecting inward from the lower ends of levers *m' m'* pivoted to
 45 the bed *b'* at *n' n'*, and provided at their upper ends with flange-forming jaws *o' o'*, adapted to move in close proximity to the front face of dies or formers *e c'*, as will be clearly understood by an inspection of the drawings.

A stiffener-blank being placed on die or
 50 mold *c'*, with the edge out of which the flange is to be formed projecting a suitable distance forward of its face, and the machine being set in operation, cross-head *d* will first be lowered through the medium of cam *u*, link *v*, and
 55 toggle-levers *a' a'* to mold and clamp the stiffener between dies *e* and *c'*, when slide *i²*, which meanwhile has remained substantially quiescent, will be raised through the medium of cam *i'* and lever *h'*, and the slots *k'* in wings *j'*,
 60 acting on pins *l'* of levers *m'*, will rock said levers on their pivots, so as to move their flange-forming jaws against the projecting edges at the sides of the front face of the molds or dies, forming and setting that portion of the
 65 flange of the stiffener or counter A indicated between the arrow-heads in Figs. 9 and 10.

As slide *i²* continues to rise the cam-shaped slots *k'* in the rings *j'* operate on pins *l'* of levers *m'*, so as to move the flange-forming jaws
 70 off from the flange of the stiffener formed and set by them, as aforesaid, when the V-shaped end *p'* of the slide engages the projecting portion of the blank at the rear or heel end of the stiffener, being at the lower portion of the front
 75 face of the dies, and irons or sets the flange at this point, the dies or molds *e c'* during all these operations holding the blank firmly clamped between them. Cam *i* is so constructed as to cause a comparatively quick re-
 80 ceeding motion to slide *i²*, when dies or molds *e c'* separate and the molded stiffener is removed.

By reference to Fig. 4 it will be seen that the crimping-face of the V-shaped end *p'* of slide *i²* is provided with a rib, *q'*, and that the edges are slightly rounded off, as at *r'*.
 85 This construction is for the purpose of insuring that there will be no sharp edge on the slide to cut or tear the stiffener in ironing or setting the flange thereon, the rib *q'* providing, in connection with the rubber springs, *s'*,
 90 (see Fig. 2,) interposed between the heads of bolts *l'* and the guide-bearings for slide *i²* to hold the latter against the face of the dies, for any unevenness or variation in the thickness
 95 of the material being operated upon, so that all portions of the flange will be ironed or rubbed down with substantially the same pressure.

By first forming or setting the side portions of the flanges—that is, that portion indicated
 100 between the arrow-heads in Figs. 9 and 10—and then the rear or heel portion, as at B, and holding the blank firmly clamped between said formers during the process, I am enabled
 105 to avoid all liability of crowding back any portion of the projecting edge of the blank between the points indicated by arrow-heads in Figs. 9 and 10, and so prevent the imperfect work which the first ironing down of the
 110 rear portion of the flange and afterward the sides would occasion.

In Fig. 5 I have shown the slide *i²* as adapted to co-operate with the dies without the levers *m'* and their co-operating appliances.

In Fig. 7 I have shown a slightly-modified
 115 form of levers *m'*, operated by the slide *i²*. In this instance the jaws *o'* operate to first form the flange on the side of the blank, as before explained, and are then moved upward over the same to iron it down, when the offset *u'* of
 120 said levers below the jaws comes in contact with the lower or heel portion of the projecting edge of the blank, as at B, Figs. 9 and 10, and forms and sets the flange in precisely the same manner as the upper U-shaped end
 125 of the slide shown in Fig. 1.

In Fig. 8 I have shown slightly-modified means for operating the jaws *o'* in precisely the same order with respect to the slide *i²*, as heretofore explained. In this instance the le-
 130 vers *m'* (which are here made in the form of slides) and their jaws *o'* are moved inward by

means of the levers *v' w'* in a manner that will be readily understood by an inspection of said last-mentioned figure.

Having thus described my invention, what I claim is—

1. The holding dies or formers for molding the stiffeners, reciprocating flange-forming jaws *o'* for forming the side portions of the flange of the stiffener, and a reciprocating slide provided with a V-shaped end, *p'*, for engaging the heel or lower projecting portion of the blank to form the flange thereon, all combined and operating substantially as and for the purposes hereinbefore set forth.

2. A single solid stationary die or former, a single solid reciprocating die or former, movable jaws for first forming the flanges on the sides of the stiffener, and a reciprocating slide for engaging the heel or lower portion of the blank to form the flange thereon, all combined and operating substantially as and for the purposes hereinbefore set forth.

3. The combination, in a counter-molder, of the rotary shaft *g'*, cam *i'*, lever *h'*, slide *i''*, and single solid molds *e c'*, all constructed, arranged, and operating as and for the purposes set forth.

4. The combination, in a counter-molder,

of rotary shaft *g'*, cam *i'*, lever *h'*, slide *i''*, movable jaws *o' o'*, and mechanism, substantially as described, connecting said jaws to said slide for moving the former, and single solid molds *e c'*, all constructed, arranged, and operating as and for the purposes set forth.

5. The combination, in a counter-molder, of rods *b*, collars *c*, cross-head *d*, springs *f*, wheel *g*, collar *i*, provided with arm *j*, shaft *k*, hand-wheel *l*, and wheel *m*, as set forth.

6. The process of molding heel-stiffeners and forming the flanges thereon hereinbefore described, which consists in molding and clamping the blank between suitable dies or formers, leaving an edge, out of which the flange is to be formed, projecting from the dies, then flanging the side portions of the projecting edge, and finally flanging the rear or heel portion of such projecting edge, substantially as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 2d day of February, A. D. 1887.

GEORGE ALFRED KNOX.

Witnesses:

ARTHUR W. CROSSLEY,
C. F. BROWN.