

No. 706,038.

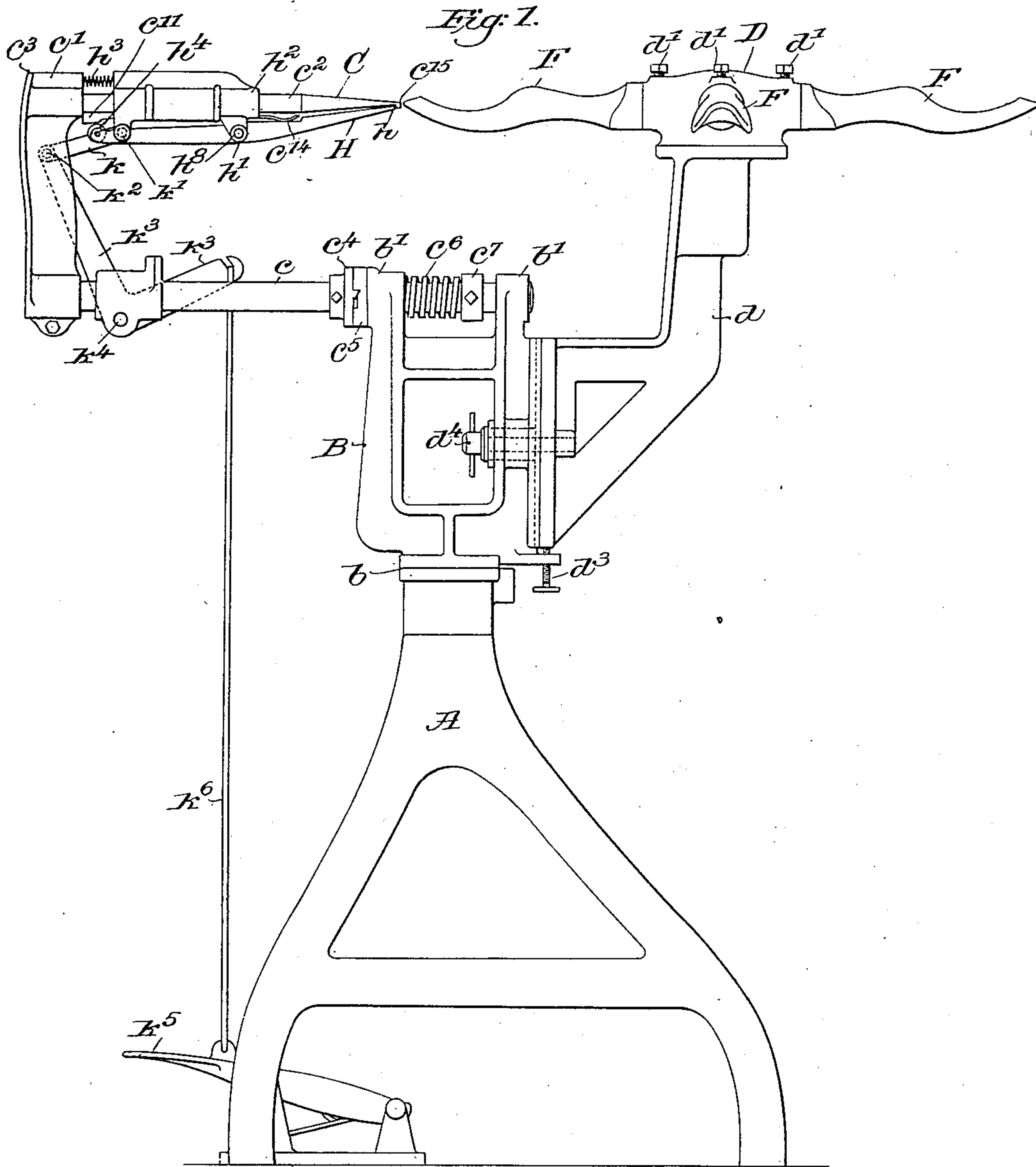
Patented Aug. 5, 1902.

A. EPPLER, JR.
SHOE TURNING MACHINE.

(Application filed Oct. 10, 1901.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:

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Horace Van Eiman

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Benjamin Phillips

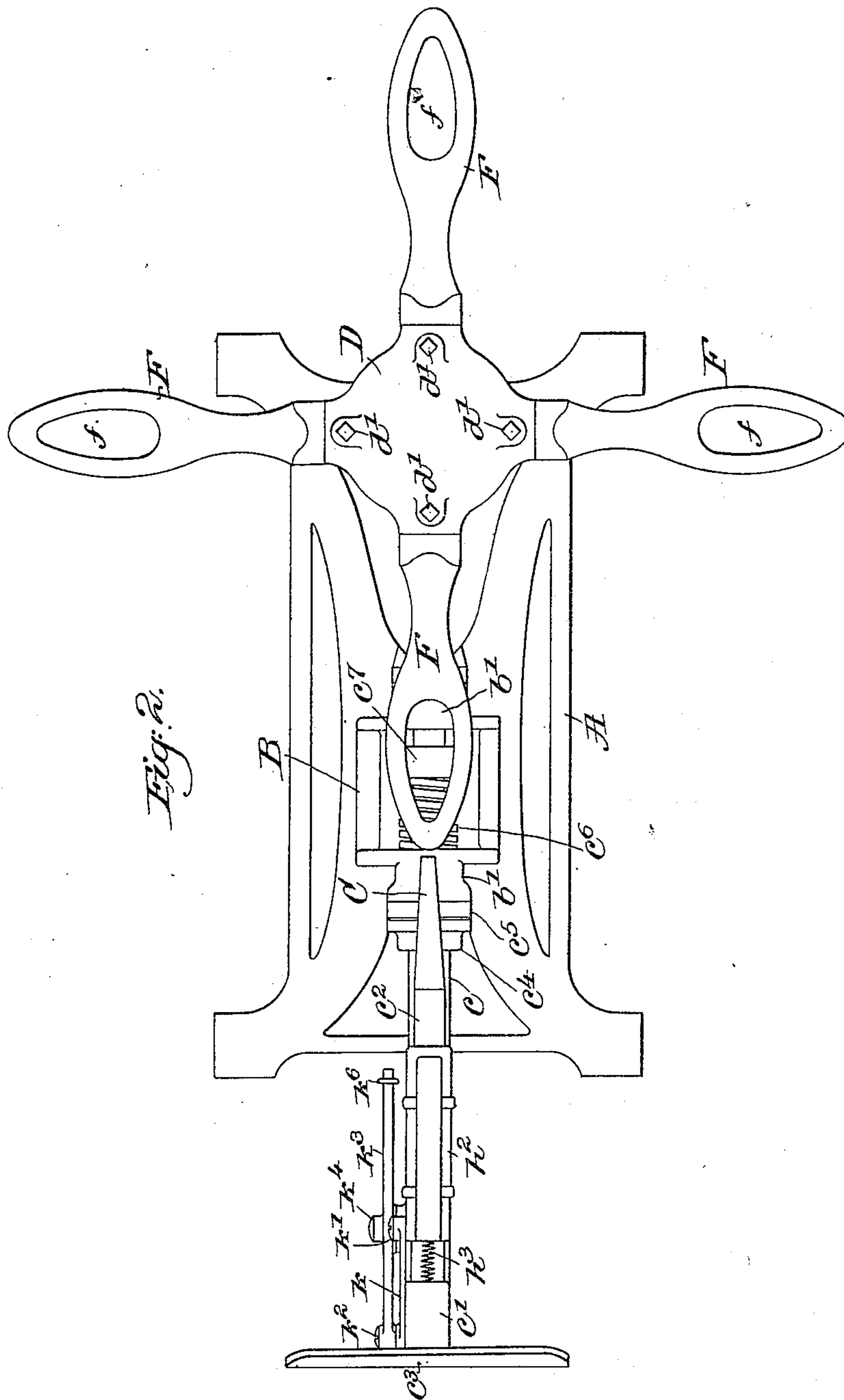
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3 Sheets—Sheet 3.

Fig. 3.

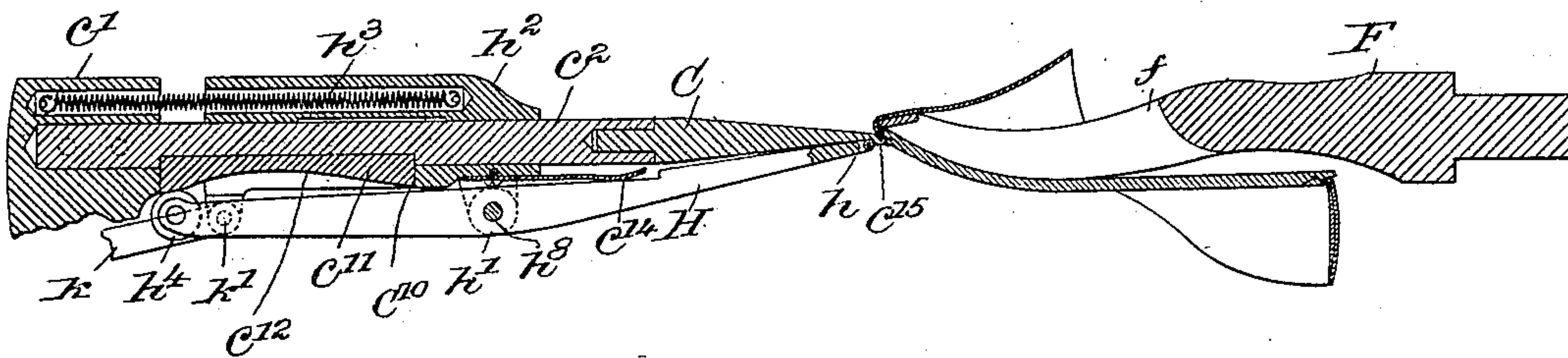
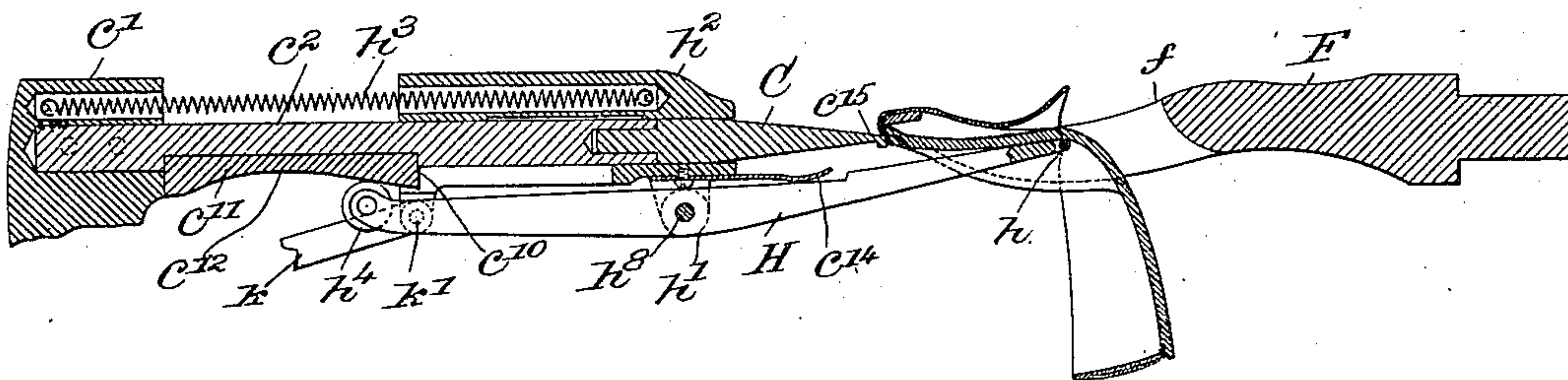


Fig. 4



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UNITED STATES PATENT OFFICE.

ANDREW EPPLER, JR., OF BOSTON, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

SHOE-TURNING MACHINE.

SPECIFICATION forming part of Letters Patent No. 706,038, dated August 5, 1902.

Application filed October 10, 1901. Serial No. 78,152. (No model.)

To all whom it may concern:

Be it known that I, ANDREW EPPLER, Jr., a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Shoe-Turning Machines; and I do hereby 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.

The present invention relates to shoe-turning machines.

Turn-shoes are commonly sewed wrong side out and after the sewing has been completed are turned right side out, and the machines which perform or assist in performing this operation are called "shoe-turning" machines.

In has been proposed in several machines of the prior art—for example, in the machine of patent to Edgerly, No. 442,770, December 16, 1890—to provide a "form," so called, having the general shape of the fore part of a last, and the function of which is to support the fore part of the shoe to be turned, which is placed thereon generally after the heel portion has been turned either by hand or by another machine. In connection with the form above described it has been proposed to provide a turning implement, which in some machines consists of a bent arm, as shown in said Edgerly patent, and in others of another last or form, as shown in patent to Collyer and Symonds, No. 146,654, January 20, 1870. The turning implement above referred to is so supported and arranged that its inner end engages the toe of the shoe to be turned when said shoe has been placed upon the form and the turning implement brought into operative relation thereto, the body of said implement extending substantially in line with the last. To turn the fore part of a shoe on such a machine after the turning implement has been brought into operative relation to the form, the operator takes hold of the heel portion and by pulling it forward turns the fore part on itself, slipping it off of the form onto the turning implement.

It has been found in practice that when the

heel portion of the shoe is pulled forward, as above described, the sole is apt to slip, not bodily, for the turning implement engaging the toe commonly prevents bodily slipping; but the back part is apt to slip forward, causing the sole to bend or buckle outward, the result of which is to impede the turning operation and to put a severe strain on the shoe, which causes the seams to gape or rip and tends to distort and otherwise injure the upper.

The present invention contemplates the provision of a supplemental turning implement which engages the sole back of the toe at the point where it is liable to buckle and prevents such buckling, said supplemental turning implement being preferably movable with reference to the form, so that its point of engagement can be transferred along the sole as the shoe is being turned.

While, as above stated, the present invention contemplates, broadly, the use of an auxiliary turning implement with any kind of a form, I prefer to use it with a form the bottom of which is sufficiently recessed to permit an inward bending of the sole, and I prefer to so arrange the auxiliary turning implement that it will not only engage and hold the sole, but will force or bend it into the recess in the form. By the arrangement last suggested I give the sole a preliminary bend or "break," as it is sometimes called in hand-turning, which substantially relieves the strain on the upper during the turning operation and makes the operation of the machine approximate more closely to hand methods.

Moreover, the present invention contemplates the provision of an improved form which also tends to relieve the upper of undue strain, and, further, certain improvements in the form and arrangement of rotating head or turret which carries the forms and other detailed improvements, the nature and advantages of which will be readily understood from the following specification.

The preferred embodiment of the present invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation, Fig. 2 is a plan, and Figs. 3 and 4 are detail views, partly in

section and partly in elevation, showing the form, turning implement, supplemental turning implement, and a part of its actuating mechanism, Fig. 3 showing the supplemental turning implement retracted and Fig. 4 showing it advanced and engaged with the sole of a shoe on the form.

In the drawings similar letters indicate like parts in the several views.

10 The machine of the drawings is provided with a suitable frame, which conveniently consists of a base A and a head B, which are so connected at *b* that the head B may be adjusted vertically to make the machine convenient for a tall or short operator. This arrangement is similar to that common in sewing-machine and other arts and need not be further described.

Mounted in suitable bearings in the up-
20 rights *b'* *b'* is a rod *c*, to which is secured a cross-piece *c'*, rigidly connecting the rod *c* with a rod *c²*, the inner end of which is provided with holding means for receiving and holding the turning implement, which, as
25 shown, is the turning-iron C. The rods *c* and *c²* and their connecting cross-piece *c'* together form a rigid supporting-yoke for the turning-iron C, much like that embodied in the shoe-turning machine known to the trade as the
30 "Miller Shoe-Turning Machine." The cross-piece *c'* supports a rest *c³* for the operator to lean against while turning the shoe, being substantially similar to that of the Miller machine. As in said Miller machine the yoke
35 which carries the turning-iron C may be turned to move said iron into and out of operative relation to the form by turning the rod *c* in its bearings. Means are provided to restrain the rod *c* from rotation when the
40 turning-iron C is in operative relation to a form, which means conveniently consist of a collar *c⁴*, fast on shaft *c*, and a collar *c⁵*, rigidly secured to the upright *b'*, the collar *c⁴* being provided with an inclined projection
45 which engages a correspondingly-inclined recess in the collar *c⁵*. A coiled spring *c⁶* is provided, which surrounds the rod *c* and is interposed between a collar *c⁷* and the upright *b'*. The spring *c⁶* acts to slide the rod *c*
50 through its bearings, said rod being arranged to slide as well as rotate therein and to keep the collars *c⁴* and *c⁵* in contact with each other, the arrangement being such that the rod *c* cannot be rotated and the yoke which supports
55 the turning-iron turned when the iron is in operative position unless sufficient force is applied to overcome the tension of the spring *c⁶*. The devices last described are not materially different from corresponding devices in said
60 Miller machine and form no part of the present invention. From the head B is projected a bracket *d*, upon which is mounted a rotating head or turret D, provided at *d'* with suitable means for holding a series of forms
65 F. The turret D is not in itself materially different from that embodied in said Miller machine. The bracket *d* is arranged to slide

in suitable vertical ways (not shown) in the head B and may be adjusted vertically to bring the form F at a level with the turning-
70 iron C and secured in the required position by means of the adjusting-screw *d³* and the clamping-bolt *d⁴*, which extends through a vertically-elongated bolt-hole in the upright *b'* and is tapped into the bracket *d*. It will be
75 noted that the head B forms a central support, from which the yoke which supports the turning implement is projected upon one side and the form-supporting turret upon the opposite side. This arrangement is, so far
80 as I am aware, novel and renders the machine more convenient to operate. The forms F are also of novel construction, being cut away or recessed at the bottom to permit the sole to be bent inward and at the top to permit
85 the upper to be drawn within the line of the full form—i. e., a form not cut away—at points where the full form would tend to bind. As shown in the drawings, this is accomplished
90 by cutting away all but the marginal portion of that part of the form which corresponds to the ball or tread portion of a last, and thus forms an aperture *f* in the form extending from a point toward the toe to a point toward the shank. I desire to say in this connection
95 that when used with means for bending in the sole I consider any construction of the bottom of the form which will permit the sole to be so bent to constitute a recess and to be within the scope of the present inven-
100 tion.

In the machine of the drawings the auxiliary turning implement H is located below the turning-iron C and is arranged to be advanced to cause its working end *h* to engage
105 the shoe at a point back of the toe and in advance of the working end of the iron C and to be retracted as the shoe is turned. As shown, the auxiliary turning implement H is pivotally supported at *h'* by a carriage *h²*,
110 which is mounted to slide upon the rod *c²*, which supports the turning-iron C. By pivotally supporting the auxiliary turning implement H, as shown, I provide for a longitudinally-tipping movement thereof, for the
115 purposes hereinafter described. A spring, conveniently the coiled spring *h³*, is provided, secured to the carriage *h²* and to the cross-piece *c'*, said spring normally acting to hold the carriage *h²* in contact with a stop *c¹⁰* on
120 the rod *c²*. As shown, the stop *c¹⁰* is formed by the projecting inner end of a spline *c¹¹*, set in the rod *c²*. Upon the spline *c¹¹* is formed a cam *c¹²*, which is engaged by a cam-roll *h⁴*, carried by the auxiliary turning implement
125 H, said roll *h⁴* being held against the cam *c¹²* by a spring *c¹⁴*, which bears upon the auxiliary turning implement H upon the opposite side of its fulcrum *h³*. As shown, the turning-iron C has at its working end a down-
130 wardly-projecting lip *c¹⁵*, behind which lies the working end of the auxiliary turning implement H when the same is in its retracted position, and the cam *c¹²* is so shaped that

when the lever H is advanced its working end *h* is first depressed to clear the lip *c*¹⁵ and to come under the sole of the shoe to be turned and is then raised to engage the sole and force it into the aperture *f* in the form. The working end *h* of the auxiliary turning implement H may conveniently be provided with an antifriction-roller.

The mechanism for moving the carriage *h*² toward the form to advance the auxiliary turning implement H consists of a link *k*, pivotally connected at *k*¹ to the carriage *h*² and pivotally connected at *k*² to the bent lever *k*³, fulcrumed at *k*⁴ on a sleeve surrounding the rod *c* and fixedly secured thereto. The lever *k*³ is operated by a treadle *k*⁵ and suitable connections *k*⁶.

The operation of the machine of the drawings is described as follows: Assuming that the bracket *d* has been properly adjusted to bring the form F to the level with the turning-iron C, the iron C is swung out of the way, a shoe with its heel portion turned is placed upon the form F, and the iron C swung back into operative position, substantially as in said Miller machine. When the turning-iron C has been brought into operative position, as above stated, with its working end in contact with the toe of the shoe to be turned, the operator by pressing down on the treadle *k*⁵ advances the auxiliary turning implement H until its working end *h* has engaged the sole of the shoe and bent it into the aperture *f* in the form F. (See Fig. 4.) Still keeping his foot upon the treadle *k*⁵ to hold the auxiliary turning implement H in the position last described, the operator grasps the heel portion of the shoe in the usual manner and pulls it forward, the upper bending on itself and the sole bending over the working end of the auxiliary turning implement. As the turning of the sole progresses the operator by gradually releasing the treadle *k*⁵ allows the spring *h*³ to retract the auxiliary turning implement H, its working end *h* forming a support, over which the sole is bent and which travels toward the toe. As the upper is being turned the cut-away portion at the upper portion of the form F by affording space into which the double material may be drawn prevents the binding of the upper upon the form.

Having thus described a preferred form of my present invention and the preferred mode of operating the same, I desire to say that I do not consider the same as to its principal features as limited to the construction herein shown and described, since said features are broadly novel, no devices having to my knowledge been provided in the prior art whereby the advantages herein set forth or any of them could be obtained.

I therefore claim, broadly, and desire to secure by Letters Patent—

1. A shoe-turning machine, having, in combination, a central support, a form-carrying turret projected from one side of said support, and a yoke for supporting a turning imple-

ment supported from the opposite side of said support, substantially as described.

2. A shoe-turning machine, having, in combination, a central support, a yoke for supporting a turning implement projected from one side of said support, a vertically-adjustable bracket projected from the opposite side thereof, and a form-carrying turret mounted upon said bracket, substantially as described.

3. A shoe-turning machine, having, in combination, a turning implement, and a form having an aperture extending from a point toward the toe to a point toward the heel, substantially as described.

4. A shoe-turning machine, having, in combination, a turning implement, a form having provision to permit the sole of a shoe to be bent inward, and an auxiliary turning implement for engaging the sole and bending it inward, substantially as described.

5. A shoe-turning machine, having, in combination, a turning implement, a form, and means for preventing the sole of a shoe on the form from bending outward during the turning operation, substantially as described.

6. A shoe-turning machine, having, in combination, a form, a turning implement supported to engage the toe of a shoe on the form, and an auxiliary turning implement supported to engage the sole, said form and auxiliary turning implement being relatively movable to transfer the point of engagement of the auxiliary turning implement with the sole along the sole during the turning operation, substantially as described.

7. A shoe-turning machine, having, in combination, a form, a turning implement supported to engage the toe of a shoe on the form, an auxiliary turning implement movable longitudinally of and transversely to the form to engage the sole back of the toe, and means for actuating the auxiliary turning implement, substantially as described.

8. A shoe-turning machine, having, in combination, a turning implement, a form having a recess into which the sole of the shoe can be bent, and means for bending the sole into said recess, substantially as described.

9. A shoe-turning machine, having, in combination, a turning implement and a form having a cut-away portion extending from a point toward the toe to a point toward the shank for preventing the binding of the upper on the form, substantially as described.

10. A shoe-turning machine, having, in combination, a form, a turning implement supported to engage the toe of a shoe on the form and having at its working end a laterally-projecting lip, and an auxiliary turning implement, the working end of which is movable from a position behind said lip into position to engage the sole of a shoe on the form back of the toe, substantially as described.

11. A shoe-turning machine, having, in combination, a form, a turning implement supported to engage the toe of a shoe on the form, an auxiliary turning implement sup-

ported adjacent to the turning implement and movable with relation thereto, and mechanism for actuating the auxiliary turning implement, substantially as described.

5 12. A shoe-turning machine, having, in combination, a form, a turning implement, an auxiliary turning implement, and means for simultaneously moving both implements out of operative relation to the form to permit a
10 shoe to be placed thereon, substantially as described.

13. A shoe-turning machine, having, in combination, a form, and a turning implement and auxiliary turning implement movable
15 with and independently of each other, substantially as described.

14. A shoe-turning machine, having, in combination, means for interiorly supporting the

shoe to be turned, a turning implement, and means exteriorly engaging the sole and movable along the same during the turning operation to insure its proper bending, substantially as described. 20

15. A shoe-turning machine, having, in combination, a turning implement, a form, and an auxiliary turning implement for engaging the sole of a shoe on the form and preventing it from bending outward during the turning operation, substantially as described. 25

In testimony whereof I affix my signature 30 in presence of two witnesses.

ANDREW EPPLER, JR.

Witnesses:

HORACE VAN EVEREN,
ALFRED H. HILDRETH.