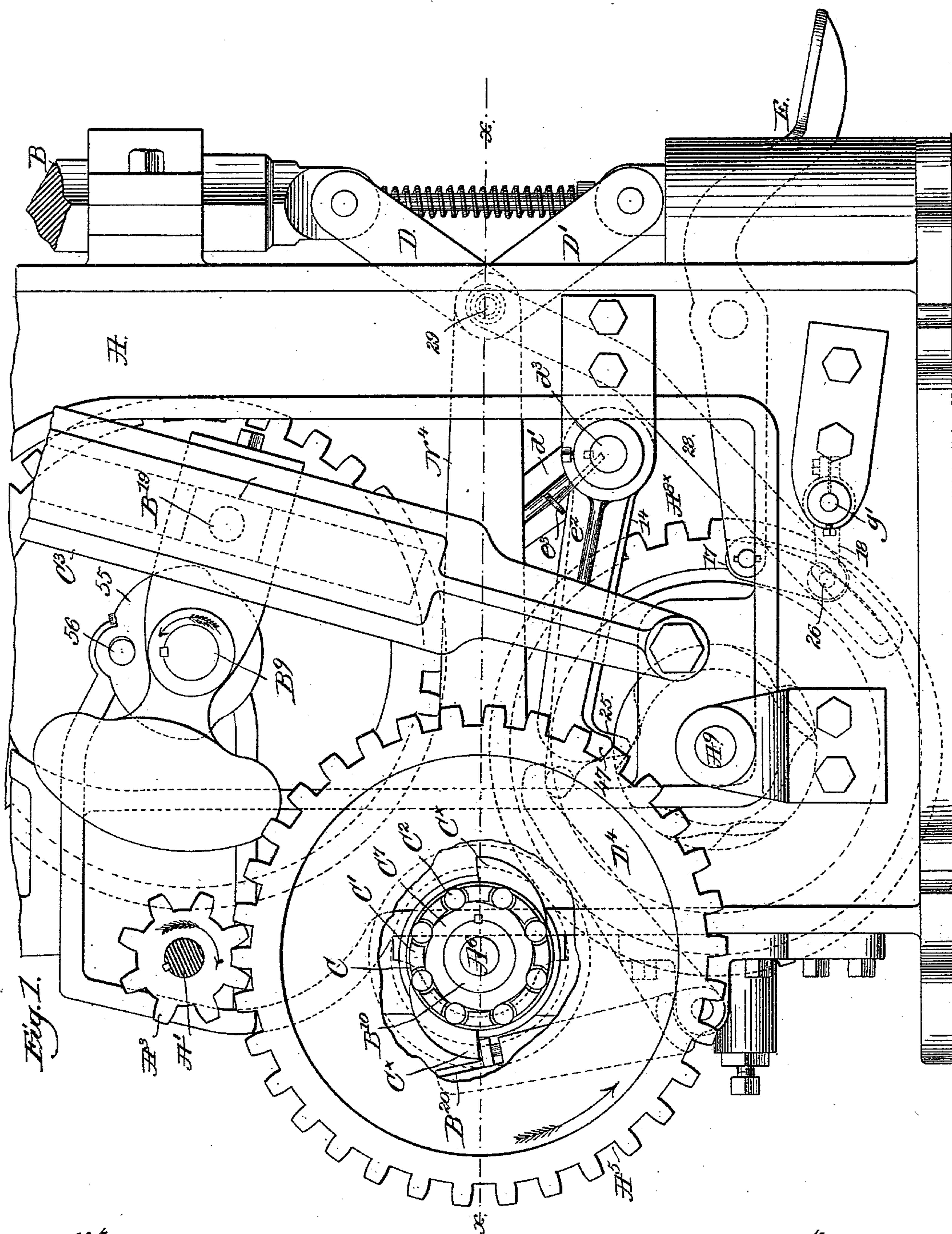


4 Sheets—Sheet 1.

HEEL TRIMMING MACHINE.

Patented Oct. 21, 1890.



Witnesses:

John F. C. Penikese

Frederick L. Emery.

Investors.

Charles W. Giddens
Atwinn D. Elliott.

By Leroy & Gregory *attys*

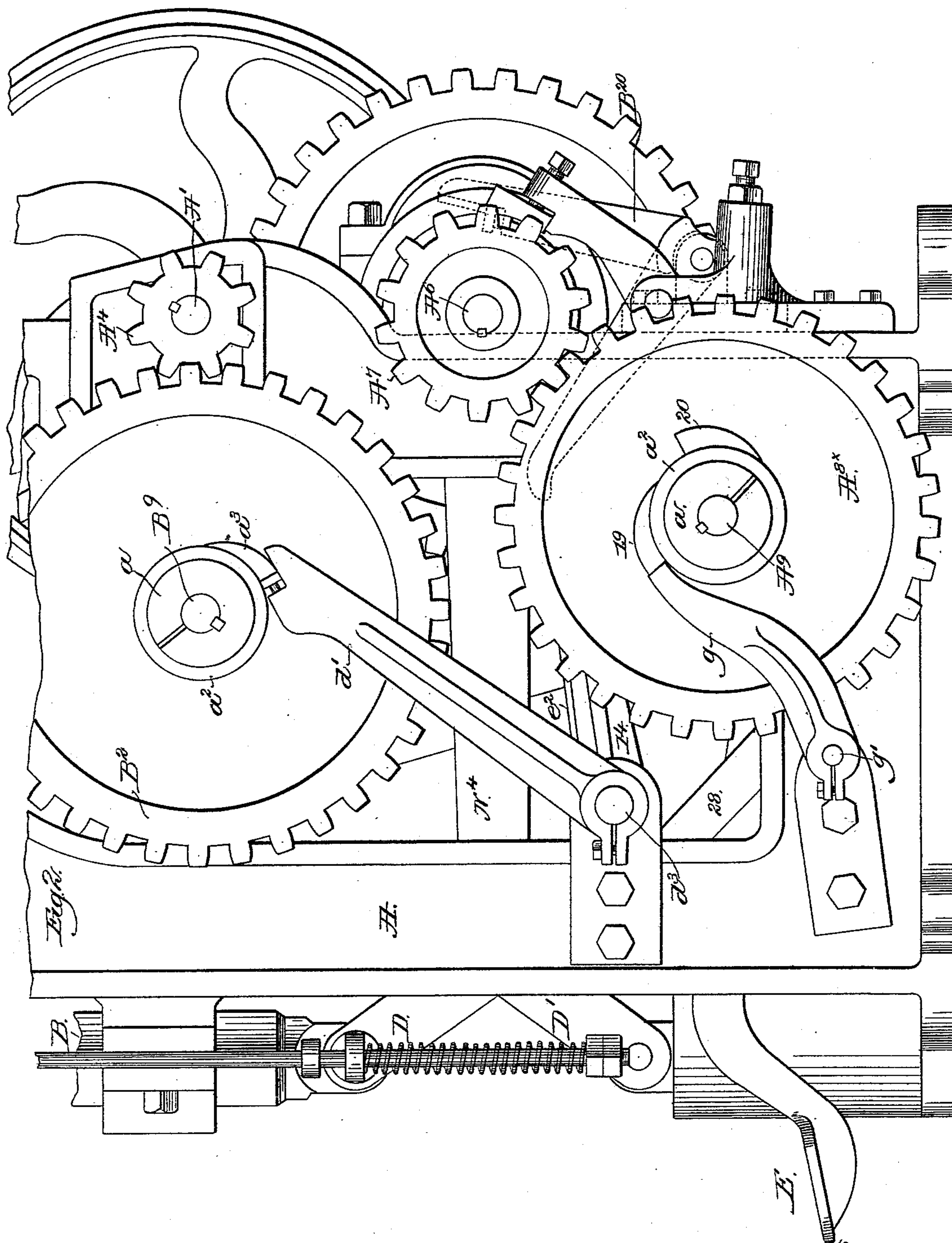
(No Model.)

4 Sheets—Sheet 2.

C. W. GLIDDEN & A. D. ELLIOTT.
HEEL TRIMMING MACHINE.

No. 439,060.

Patented Oct. 21, 1890.



Witnesses.
John F. C. Printz
Frank L. Emery.

Inventors.
Charles W. Glidden
by Alvin D. Elliott
Jenney & Gregory Attys.

(No Model.)

4 Sheets—Sheet 3.

C. W. GLIDDEN & A. D. ELLIOTT.
HEEL TRIMMING MACHINE.

No. 439,060.

Patented Oct. 21, 1890.

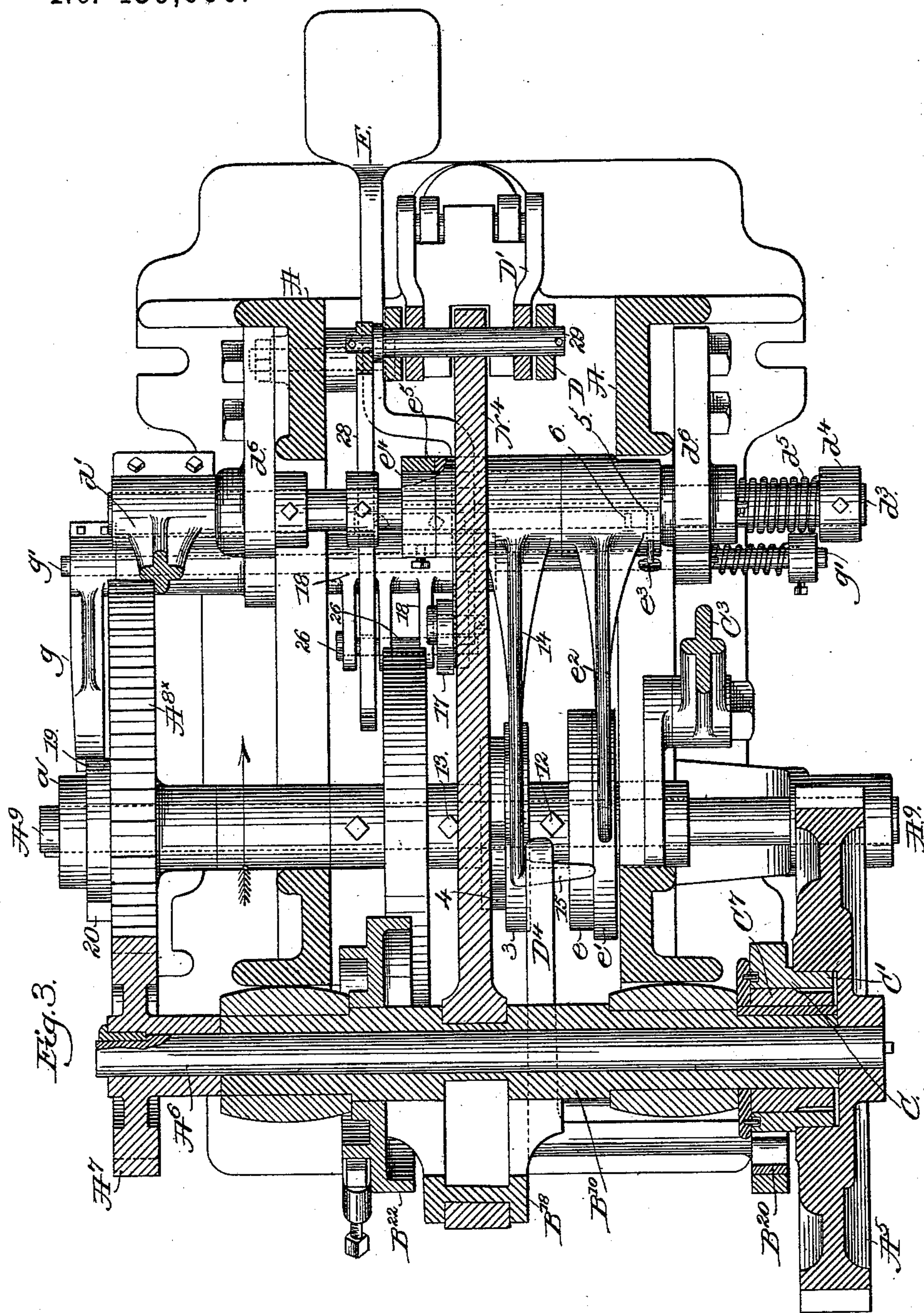


Fig. 3.

Witnesses.

John P. C. Smith
Frank L. Emery.

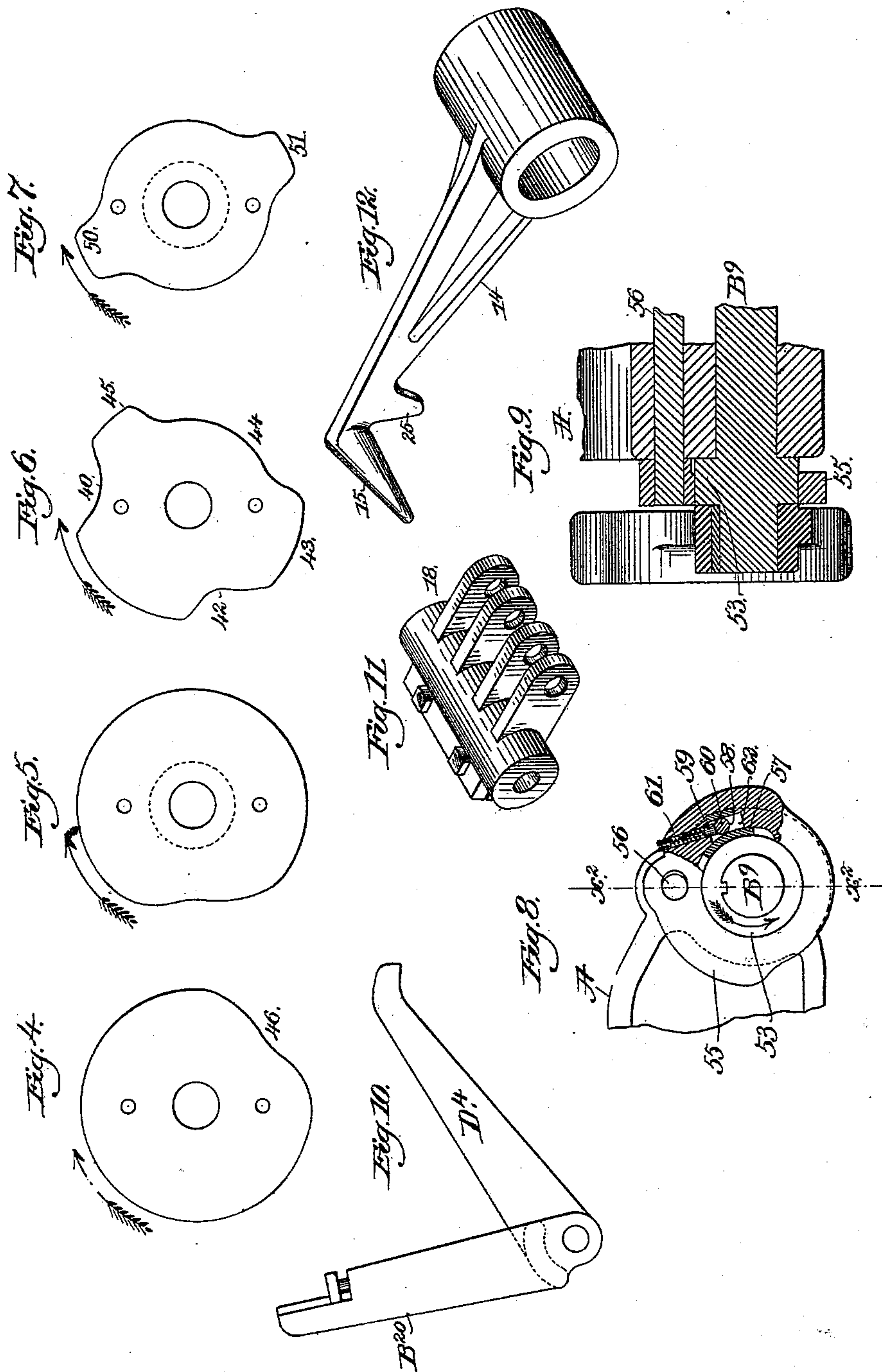
Inventors.

Charles W. Glidden
Alvin D. Elliott
by Lemby & Gregory Attys

4 Sheets—Sheet 4.

No. 439,060.

Patented Oct. 21, 1890.



Witnesses.
John F. C. Preimherb
Frederick A. Emery.

Erwin D. Elliott.
Charles W. Glidden.
by Lemby & Gregory Attys.

UNITED STATES PATENT OFFICE.

CHARLES W. GLIDDEN, OF LYNN, AND ALVIN D. ELLIOTT, OF LAWRENCE,
ASSIGNORS TO JAMES W. BROOKS, TRUSTEE, OF CAMBRIDGE, MASSA-
CHUSETTS.

HEEL-TRIMMING MACHINE.

SPECIFICATION forming part of Letters Patent No. 439,060, dated October 21, 1890.

Application filed March 30, 1889. Serial No. 305,419. (No model.)

To all whom it may concern:

Be it known that we, CHARLES W. GLIDDEN and ALVIN D. ELLIOTT, of Lynn and Lawrence, respectively, county of Essex, State of Massachusetts, have invented an Improvement in Heel-Trimming Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention is intended as an improvement upon the machine described in United States application, Serial No. 297,205, filed January 22, 1889, and has for its object more especially to simplify and improve the means employed for effecting the starting and stopping of the several shafts employed therein, but especially the tubular shaft or sleeve having the eccentric to move the die-bed spindle and the cam-shaft and the trimming-shaft. The cam-shaft in the application referred to has on it two cams having projections to automatically control the rise and fall of the die-bed spindle and a trimmer-cam, and the machine is devised for two classes of nailing—viz., to nail the heel on the shoe and add a top lift and then trim the heel, including the top lift, or to simply nail the heel on the shoe and then trim it. In the machine described in the said application one or the other class of work might be done at will; but the operator before starting the machine had to move a certain key or locking device longitudinally on the cam-shaft, so as to loosen some and fix other cams with relation to the said shaft, so that when the machine was started by the operator (he putting his foot on the usual treadle) the machine would continue in motion, the stopping and starting of the different shafts being effected automatically until the heel was completed, and the trimming-shaft when started was rotated far enough to complete a full rotation. For one class of work, as when a top lift was employed, the die-bed spindle was first elevated to nail the heel, it thereafter being depressed to permit the top lift to be interposed between the heel and the top-lift plate, and then the die-bed spindle was raised to blind on the top lift, the die-bed spindle being stopped in its ele-

vated position while the heel was trimmed, and then the die-bed spindle was again lowered and the machine stopped automatically, this requiring two full rotations of the shaft employed to actuate the die-bed spindle. In the other plan, after the operator started the machine by his foot and the usual starting-treadle, the die-bed spindle was raised to nail the heel, and the said spindle was kept elevated long enough to enable the heel to be trimmed, and then the die-bed spindle was lowered and the machine stopped automatically, and this was done during one rotation of the sleeve for actuating the die-bed spindle; but the same amount of time was taken for nailing each class of work, for in the first class of work the die-bed spindle remained down longer in the trimming than in the latter class of work. In both kinds of work one full rotation of the cam-shaft was required, the die-bed spindle in one class of work being raised and lowered while the cam-shaft was making one rotation, while in the other class of work the die-bed spindle was raised twice during one rotation of the said cam-shaft, each rise and each fall of the die-bed spindle being completed each in a half-rotation of the said cam-shaft.

In the machine herein to be described the cam-shaft is permitted to have either a continuous motion during each full rotation or to have an intermitting motion during each full rotation, that depending upon the class of work to be done. Herein the work to be done is the same as that which is to be done in the said application.

Our invention consists, essentially, in the combination, with the cam-shaft and a compound cam thereon and a rock-shaft having an arm to control the time of starting and stopping of the trimmer-shaft, of an arm co-operating with the said cams, the said arm being movable longitudinally upon the said rock-shaft to enable it to be actuated by one or the other of the said cams, substantially as will be described.

Other features of our invention will be hereinafter described and made the subject of claims at the end of the specification.

Figure 1 is a partial left-hand side eleva-

tion of a heeling-machine embodying our present improvements, the wheel A^5 being partially broken out to show the clutch and other parts with which it co-operates, the main power-shaft being in section, the usual belt-pulleys being omitted. Fig. 2 is a partial right-hand side elevation of the machine shown in Fig. 1. Fig. 3 is a section below the dotted line x , Fig. 1. Figs. 4, 5, 6, and 7 are details of the cams carried by the cam-shaft and to be referred to. Fig. 8 is a detail referring to devices for stopping the trimming-shaft at the completion of its rotation. Fig. 9 is a section of Fig. 8 in the line x^2 . Fig. 10 shows the clutch-controller detached. Fig. 11 shows the hub 18 detached; and Fig. 12 shows the lever 14 detached.

The frame-work A of the machine, the die-bed spindle B, its co-operating toggle-link D D' , the connecting-rod N^4 , having at one end an eccentric-strap surrounding the eccentric B^{18} , the sleeve B^{10} , carrying the said eccentric and loose on the shaft A^6 , the brake-wheel B^{22} , the toothed gear A^5 , fast upon the shaft A^6 and having at its opposite end the pinion A^7 , the gear A^{8x} , loose upon the cam-shaft A^9 , the main shaft A' , having the pinion A^3 to engage and rotate the gear A^5 , the said shaft having at its opposite end the pinion A^4 to engage the large toothed gear B^2 , loose on the trimming-shaft B^9 , the crank-pin B^{19} , entering a block fitted to slide in a slot of the trimmer-lever C^3 , the treadle E, the cam-faced hub C^7 , fast on the sleeve B^{10} and surrounded loosely by the collar C, having projections C^x and fingers C' , and rolls C^2 between the said fingers and interposed between the cam-hub C^7 and the inner wall of a chamber made in the gear or wheel A^5 , and the clutch-controlling device B^{20} , having an arm B^4 , the like hubs a , fast on the shafts A^9 B^9 , the like loose hubs or clutch-collars a^2 a^2 , having fingers, and between them rolls, the fingers and rolls being in practice interposed between the wheels A^{8x} and B^2 , and many-faced cam-hubs fast on the said shafts A^9 B^9 are and may be all as in the machine described in the application referred to, wherein the same letters are employed to designate like parts, except that the loose hub within the wheel A^{8x} has two rather than one projection.

Herein we have considered it unnecessary to specifically illustrate the entire mechanism of the clutches which are interposed between the said wheels A^{8x} and B^2 and the shafts on which they normally run loose, for the construction of the said clutches is fully described in the said application, the said clutches being substantially the same as the clutch which co-operates with the wheel A^5 .

The cam-shaft A^9 has fast upon it near the left-hand side of the machine a cam e , the hub of which is secured to the shaft by a set-screw 12, the said cam having secured to it at its left-hand side by suitable pins or studs a cam e' , thus making a compound cam. A little farther to the right the said shaft A^9

has fast upon it a cam 4, the hub of which receives a set-screw 13, the left-hand face of the cam 4 having secured to it by suitable pins a cam 3, thus making a second compound cam. These compound cams might each be in a single piece. The outlines of these cams are fully shown in Figs. 4 to 7. The cams e e' and the cams 3 4 work together in pairs. The cams e e' control the time of the operation of the trimming mechanism, and the cams 3 and 4 the times at which the die-bed spindle shall rise and fall, and to do the different kinds of nailing herein provided for it will be obvious that the trimming mechanism has to be started in a different time when nailing through and when blinding a top lift, and so also the die-bed spindle has to have given to it an extra rise and fall when the heel is to have a top lift blinded upon it before trimming.

The rocker-shaft d^3 herein shown may be considered to be substantially the same as that shown in the said application; but herein it is moved by different means and carries different devices. The shaft d^3 at its end at the right-hand side of the machine has fast upon it a clutch-controlling arm d' , which co-operates with the single projection a^3 of the clutch-collar surrounding the cam-hub a , fast upon the trimming-shaft B^9 . At its opposite end the shaft d^3 has fast upon it a collar d^4 , to which is connected one end of a spring d^5 , the other end of the spring being fastened by a suitable pin or stud to one of the like bearings d^6 , in which the said shaft d^3 is mounted to rock, the said spring acting normally to keep the arm d' out of the range of movement of the said projection a^3 and to keep pressed against the periphery of the cam e' or e , according to the work to be done, an arm e^2 , which is keyed to the shaft d^3 , so that the said arm or its hub may be moved longitudinally on the said shaft, the hub of the arm e^2 having a suitable locking device, as e^3 , herein shown as a pin, which may be entered into either the hole 5 or the hole 6, Fig. 3, in the said shaft.

The hub of the arm e^2 has projecting from one side of it a sleeve e^4 , (see Fig. 3,) upon which is mounted loosely the hub of an arm 14, the said arm by its own gravity riding upon either the cam 3 or the cam 4, according to the work to be done, the said arm 14 being moved longitudinally upon the shaft d^3 in unison with the arm e^2 , but rotating independently of the said arm e^2 on the sleeve e^4 . The end of the sleeve e^4 has applied to it a collar e^5 , so as to prevent the hub of the arm 14 from slipping off the said sleeve, the said collar compelling the arm 14 to be moved in unison with the sleeve as it is reciprocated upon the shaft d^3 .

The end of the arm 14 farthest from the shaft d^3 has a toe 15, which is extended laterally, as herein shown, toward the cam e ; but it does not touch that cam. The toe 15 serves to support the inner end of the lever D^4 , forming part of the main clutch-controller

B²⁰, and the said clutch-controller is actuated by the said arm 14 to release the clutch-collar C at different times in the rotation of the cam-shaft, according to which cam 3 or 4 acts on the heel 25 (see Fig. 1) of the arm 14.

The foot-treadle E has jointed to it at its inner end a link 17, which at its lower end is jointed by a pin 26 to an arm of a hub 18, fast on a rock-shaft *g'*, which may be considered to be the same as the rock-shaft designated by like letter in the said application, the said rock-shaft having fast upon it at the right-hand side of the machine the finger *g*, which co-operates with, as herein shown, two projections 19 20 of the clutch-collar surrounding the hub *a*, fast on the shaft A⁹ and common to the said application, the said clutch-collar herein shown differing from that shown in the said application only in the addition to it of a second projection, as 20, which enables the machine to be stopped just as the die-bed spindle is lowered to afford sufficient time for the operator to insert a top lift by hand, after which the machine is again started by the operator placing his foot on the treadle; but this extra projection might be dispensed with were the operator sufficiently expert to obviate risk of injury to his hands while inserting the top lift.

The hub 18 has, as shown separately in Fig. 11, several arms, chiefly to firmly support the pin 26, the said pin receiving upon it one end of a slotted link 28, the other end of the said link being attached to the usual pin 29, employed to unite together the two links D D' of the toggle, the said link 28, when the machine is set to simply nail a heel through and then trim it, serving as the die-bed spindle is lifted to nail the heel through, to turn the rock-shaft *g'* and keep the finger *g* out of the range of movement of the projection 20 of the loose hub or clutch-collar *a*² within the wheel A^{8x}, and consequently the cam-shaft is enabled to complete its rotation without stopping.

Referring to Fig. 1, the arm *e*² is shown as resting immediately above the cam *e'*, and the heel 25 of the arm 14 is supposed to be resting in the space 40 of the cam 3. With the arms in this position, the machine is adapted to first nail a heel through, then blind on a top lift and trim the heel, and during this operation the operator has to actuate the treadle E twice to start the cam-shaft, in order that the cam 3 may, through the arm 14 and the clutch-controller B²⁰, release the clutch-collar C and start the sleeve B¹⁰ to complete one rotation to thus raise and lower the die-bed spindle, the heel 25 during the first rise and fall of the die-bed spindle resting on the part 41 of the cam 3, the said heel entering the space 42 of the cam 3 as the die-bed spindle completes its descent.

When the operator depressed the treadle to effect the starting of the cam-shaft, as stated, he immediately removed his foot from the treadle, permitting the arm *g* to descend

and catch the projection 20, it being so located as to effect the stopping of the cam-shaft just as the enlarged part 41 of the cam 3 passes beyond the heel 25 of the arm 14, and at this time the cam-shaft stops, the sleeve B¹⁰ having been rotated once to nail the heel on and lower the die-bed spindle. The operator then inserts the top lift by hand and again depresses the treadle E to again start the cam-shaft to enable the rise 43 of the cam 3 to act and start the sleeve B¹⁰ to again raise the die-bed spindle; but the length of the said rise 43 is such as to permit the lever 14 to descend as soon as the die-bed spindle has been elevated, thus permitting the clutch-controller B²⁰ to act and stop the rotation of the sleeve B¹⁰ while the die-bed spindle is elevated, leaving the said die-bed spindle up long enough to enable the usual heel-trimming devices, common to United States Patent No. 166,765, to act and trim the heel, the heel 25 remaining in the space 44 while the trimming operation is being performed, which done, the projection 45 of the cam 3 acts on the heel 25 to again lift the arm 14 and again effect the movement of the clutch-controller to again start the sleeve B¹⁰ and lower the die-bed spindle, the said cam thus making one complete revolution, the heel 25 standing in the space 40, and at this time the arm *g* again meets the projection 19 of the clutch-collar *a*² on the cam-shaft A⁹. As the die-bed spindle completed its second ascent, as stated, the space 46 in the cam *e'* came under the projection 47 of the arm *e*², thus permitting the spring *d*⁸ to turn the shaft *d*³ and remove the arm *d'* from engagement with the projection *a*³ of the clutch-collar *a*², forming part of the clutch mechanism at the interior of the wheel B², to thus effect the starting of the trimming-shaft B⁹ while the die-bed spindle remains up, the projection 47 of the arm *e*² riding upon the substantially circular periphery of the said cam just as the projection 45 of the cam 3 acts, as described, to effect the lowering of the die-bed spindle.

To simply nail the heel through and then trim it all during one rise and fall of the die-bed spindle, it is only necessary to actuate the locking device *e*³ and shove the arms *e*² and 14 laterally on the shaft *d*³ far enough to place the projection 47 in the range of the cam *e* and the heel 25 in the range of the cam 4. The cam *e* is of the same outline as the cam *e'*, only the depression in its substantially circular periphery is a little farther forward in the direction of rotation of the said cam, so as to start the trimming-shaft as soon as the die-bed spindle at its first rise rather than at its second rise, as when a top lift was blinded on.

Referring to the cam 4, it will be seen that its first starting projection 50 is substantially half the length of the rise 41 on the cam 3, and as a result thereof the clutch-controller B²⁰ is permitted to act quicker and stop the rotation of the sleeve B¹⁰ with the die-bed spindle elevated, and to prevent the arm *g*

from striking the second projection 20 of the clutch-collar, before referred to, and thus stop the rotation of the cam-shaft before the trimming of the heel was completed, the link 28 (the die-bed spindle then being elevated) acts on the pin 29 and rotates the rock-shaft g' in the direction to keep the arm g out of the range of movement of the projection 20. After the heel has been trimmed the rise 51 of the cam 4 acts to lift the arm 14 and again turn the clutch-controller B^{20} to again start the sleeve B^{10} for a half-rotation to lower the die-bed spindle, it remaining down while the cam-shaft completes its full rotation and until the operator again moves the treadle E.

To prevent retrograde motion of the trimming-shaft, we have provided the said shaft with a fast collar 53, (see Fig. 9,) which we have surrounded between the frame-work A and the weighted crank 54 by a hood 55, which is held in place by a pin 56. This hood is recessed, as shown in Fig. 8, to receive a loose concavo-convex brake-block 57, the concaved side of the block fitting the hub 53, the convex face of the block being acted upon by a friction dog or roll 58, which is kept pressed into the space between the said block and a shim 60 by a pin 59, acted upon by a spring 61. In the rotation of the trimming-shaft, the latter by friction causes the block 57 to travel with it in the direction of rotation of the shaft B^9 , moving the roll 58 into the widest part of the space 62; but as soon as the rotation of the shaft B^9 is stopped, and especially if there is any retrograde motion of the shaft, the block is moved in the direction to carry the roll into the narrowest end of the space 62 and cause the roll to act as a wedge on the block 57 and cause it to exert extra friction on the hub 55.

I claim—

1. In a heel-trimming machine, the trimming-shaft B^9 , a clutch thereon, the cam-shaft having the compound cams $e e'$, and the rock-shaft d^3 , having the arm d' , to co-operate with said clutch to control the time of starting and stopping the rotation of the trimmer-shaft, combined with the arm e^2 , made movable longitudinally on the said shaft, substantially as described.

2. In a heel-trimming machine, the die-bed spindle, the shaft A^6 , a sleeve having an ec-

centric, the link N^4 and toggle $D D'$, and a clutch and clutch-controller, combined with the cam-shaft having the cams 3 and 4, the rock-shaft d^3 , and arm 14, provided with a heel 25, the said arm being made movable laterally, as described, to place the said heel in the range of one or the other of the said cams, according to the movement desired for the die-bed spindle, substantially as described.

3. In a heel-trimming machine, the cam-shaft having the cams $e e'$ and 3 and 4, working in pairs, the rock-shaft d^3 , the arm e^2 , mounted on the said rock-shaft to be moved longitudinally thereon, and the arm 14, mounted loosely on a hub of the arm e^2 and loosely with relation to the said rock-shaft and movable laterally in unison with the said hub and arm, combined with a locking device to keep the arm e^2 and the arm 14 in their adjusted positions with relation to the said cams to control the starting and stopping of the trimming-lever and the rise and fall of the die-bed spindle in different times and succession, as described.

4. In a heel-trimming machine, the die-bed spindle, the toggle $D D'$, means to actuate it, the cam-shaft, the rock-shaft g' , and its arm g , to determine the time of stopping and starting the cam-shaft, combined with the link 28, connected to the said toggle, and means between it and the said rock-shaft g' to partially rotate the latter and prevent the stopping of the cam-shaft while the die-bed spindle is elevated and the trimming-lever is being operated to trim a heel, substantially as described.

5. The combination, with the trimming-shaft B^9 , its arm, and the lever C^3 , moved thereby and adapted to actuate the heel-trimming devices, of a friction-brake, substantially as described, including as one of its parts a roll whereby retrograde rotation of the said shaft may be checked, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

CHARLES W. GLIDDEN.
ALVIN D. ELLIOTT.

Witnesses:

WILLIAM H. J. FITZGERALD,
WILBUR E. ROWELL.