

1,019,398.

8 SHEETS--SHEET 1.

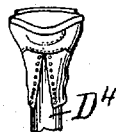
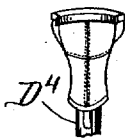
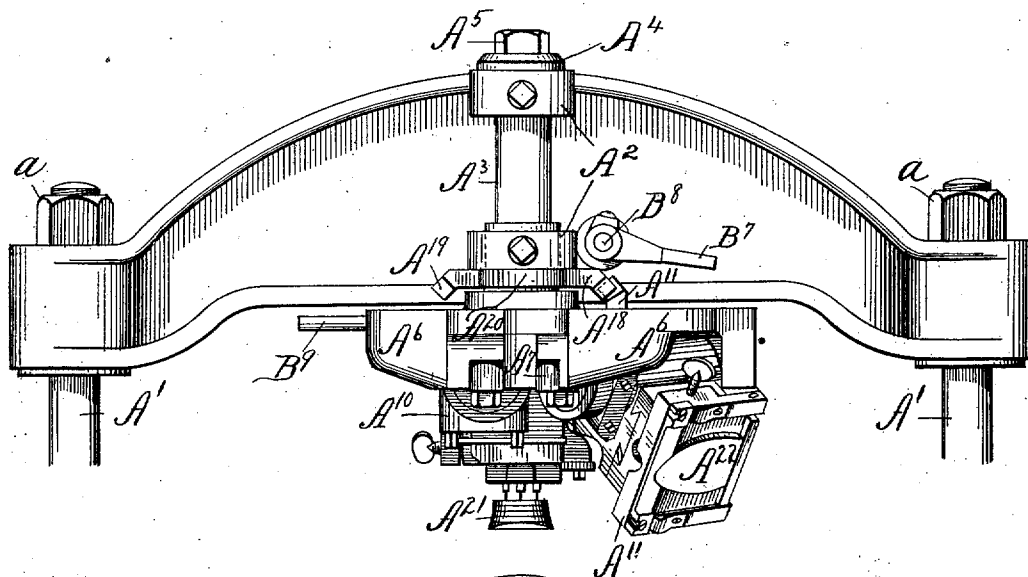


Fig. 1.



Witnesses:

A. L. Messer
V. M. MacLellan.

Fig. 2.

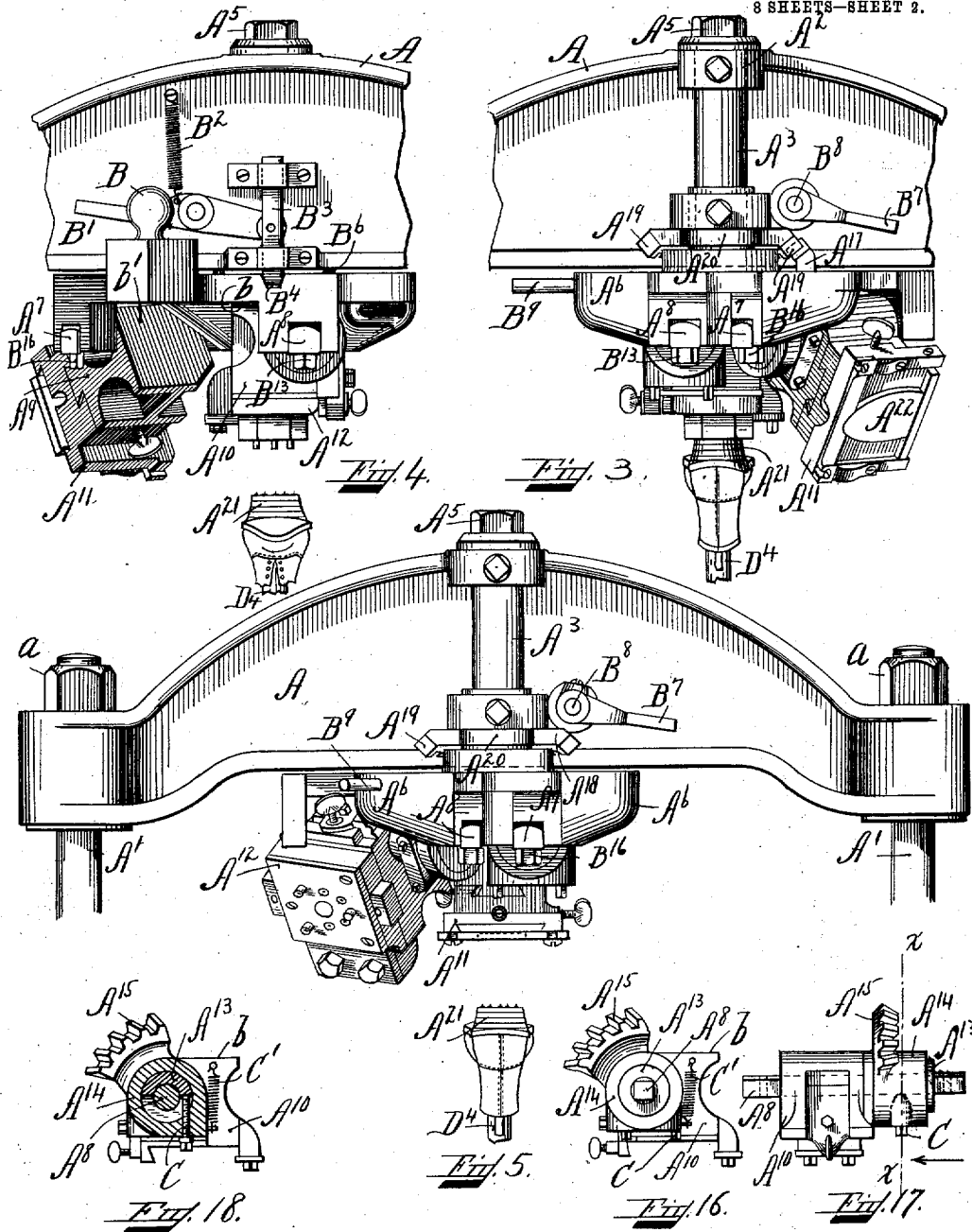
Inventor:
Erastus Nordward
by J. S. Russ to
Atty

E. WOODWARD.
HEEL ATTACHING MACHINE.
APPLICATION FILED JUNE 8, 1901.

1,019,398.

Patented Mar. 5, 1912.

8 SHEETS—SHEET 2.



Witnesses:
A. L. Wessie
V. M. MacLellan

Inventor:
Erastus Woodward
By J. B. Ruob
att'y

E. WOODWARD.
HEEL ATTACHING MACHINE.
APPLICATION FILED JUNE 6, 1901.

1,019,398.

Patented Mar. 5, 1912.

8 SHEETS—SHEET 3.

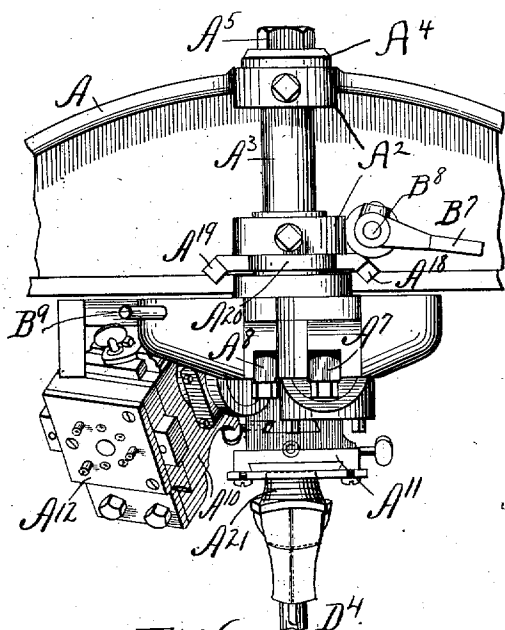


Fig. 6.

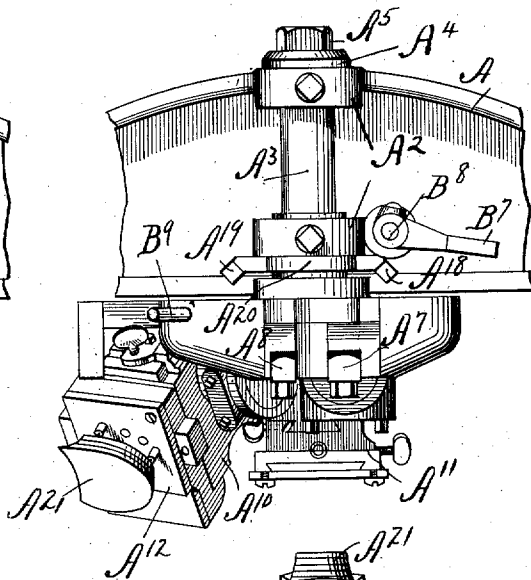


Fig. 7.

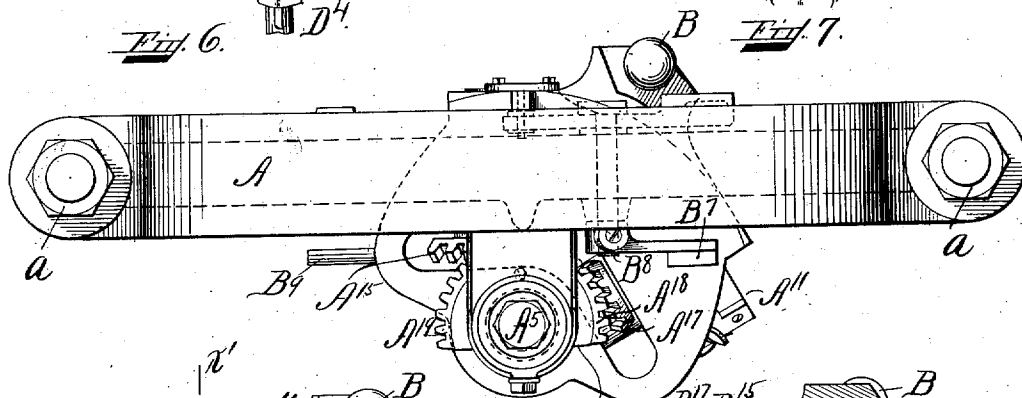


Fig. 8.

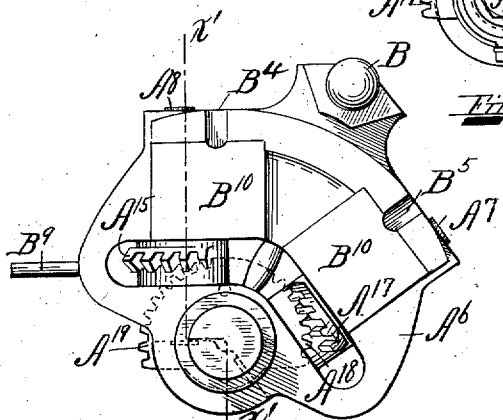


Fig. 9.

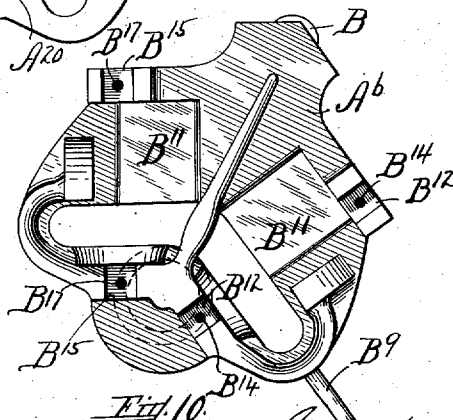


Fig. 10.

Witnessed:
A. L. Messer
V. M. Mac Kellan.

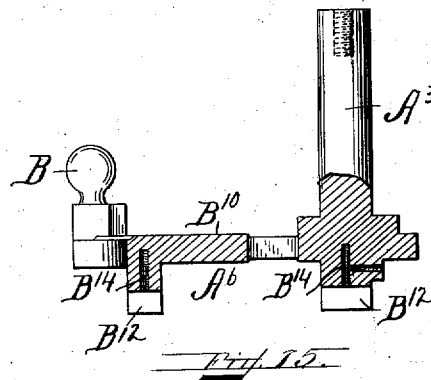
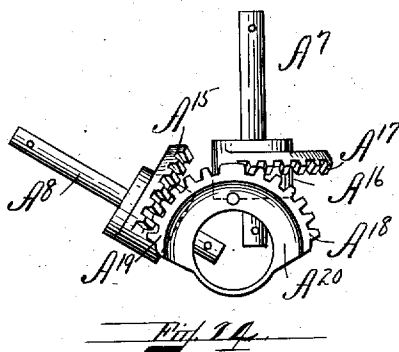
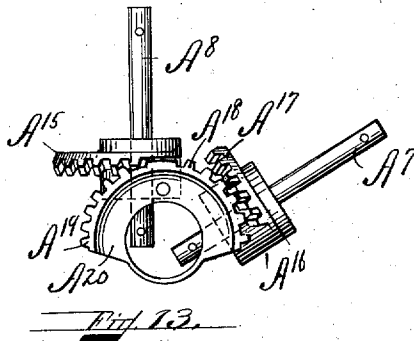
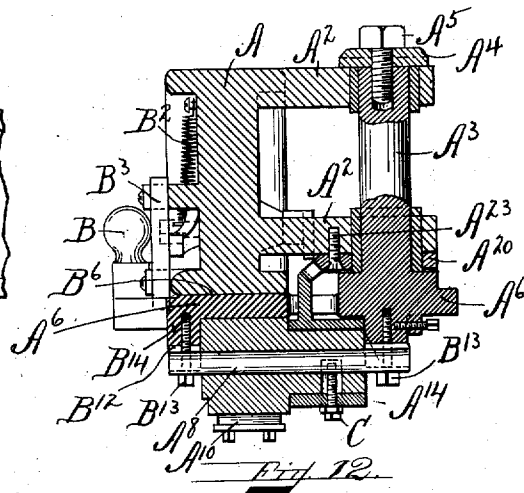
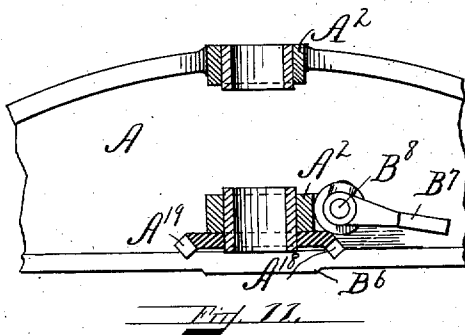
Inventor:
Erastus Woodward
By J. S. Rusk
att.

E. WOODWARD.
HEEL ATTACHING MACHINE.
APPLICATION FILED JUNE 6, 1901.

1,019,398.

Patented Mar. 5, 1912.

8 SHEETS—SHEET 4.



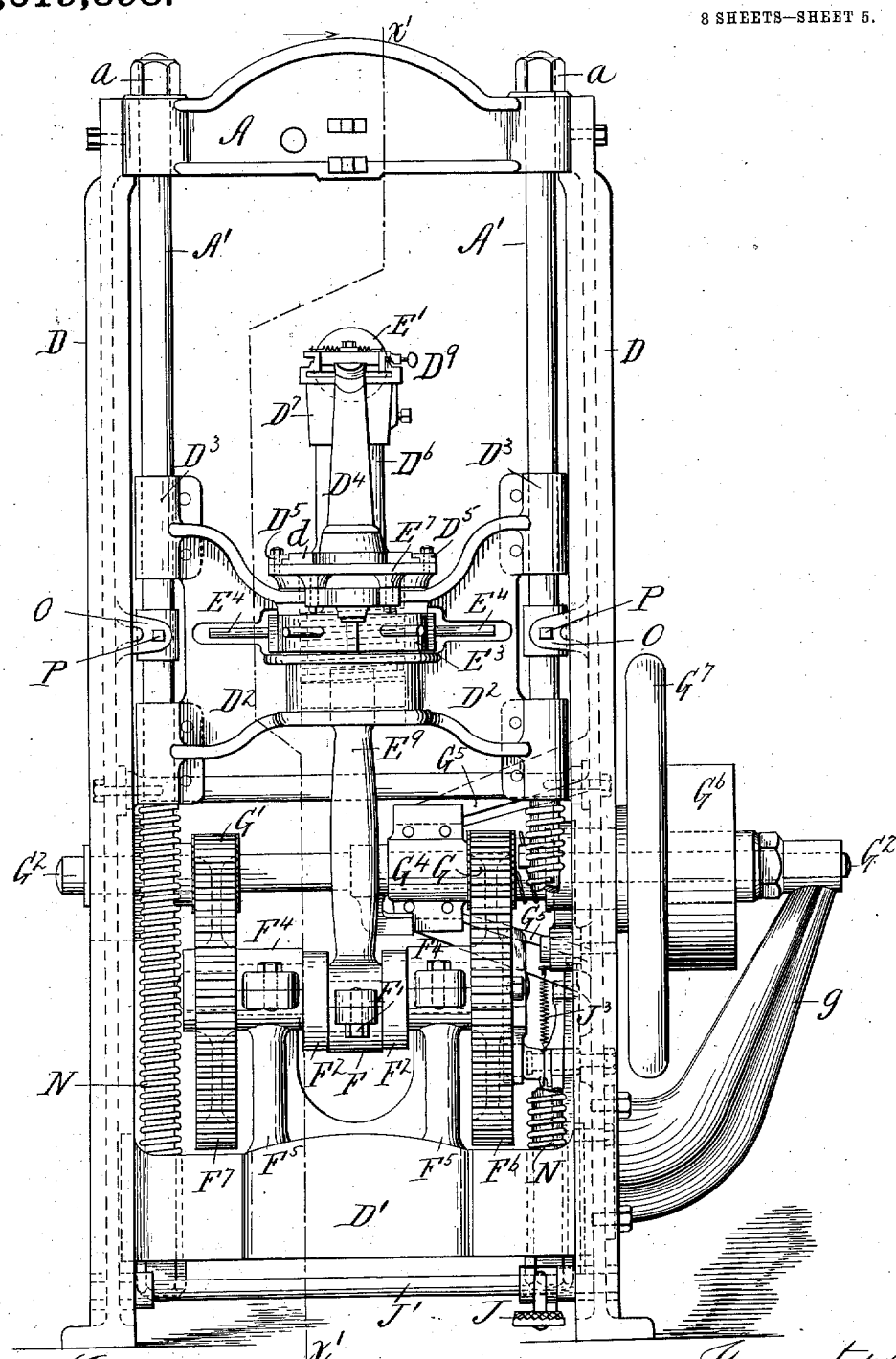
Witnesses:
A. D. Messer
V. M. MacKellau.

Inventor:
Erastus Woodward
By J. S. Rush
att'y

E. WOODWARD.
HEEL ATTACHING MACHINE.
APPLICATION FILED JUNE 6, 1901.

1,019,398.

Patented Mar. 5, 1912.
8 SHEETS—SHEET 5.



Witnesses: Ed. 19
Ad. Thuermer
V. M. Macellan.

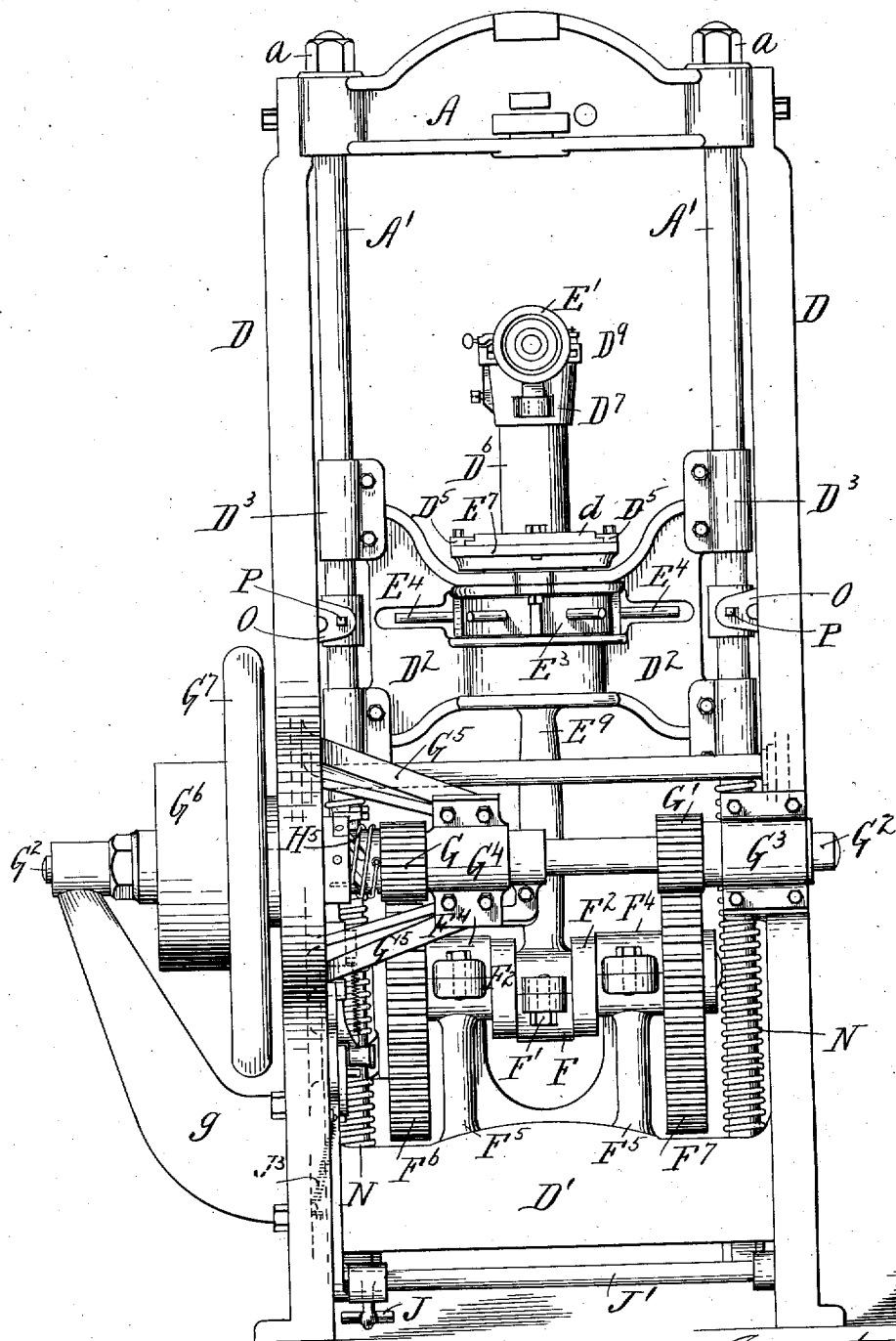
Inventor:
Eugene Woodward
By Ed. Rusk
att.

E. WOODWARD.
HEEL ATTACHING MACHINE.
APPLICATION FILED JUNE 6, 1901.

1,019,398.

Patented Mar. 5, 1912.

8 SHEETS—SHEET 6.



Witnesses:
A. d. Keesey
V. M. Mackellan.

Fig. 20.

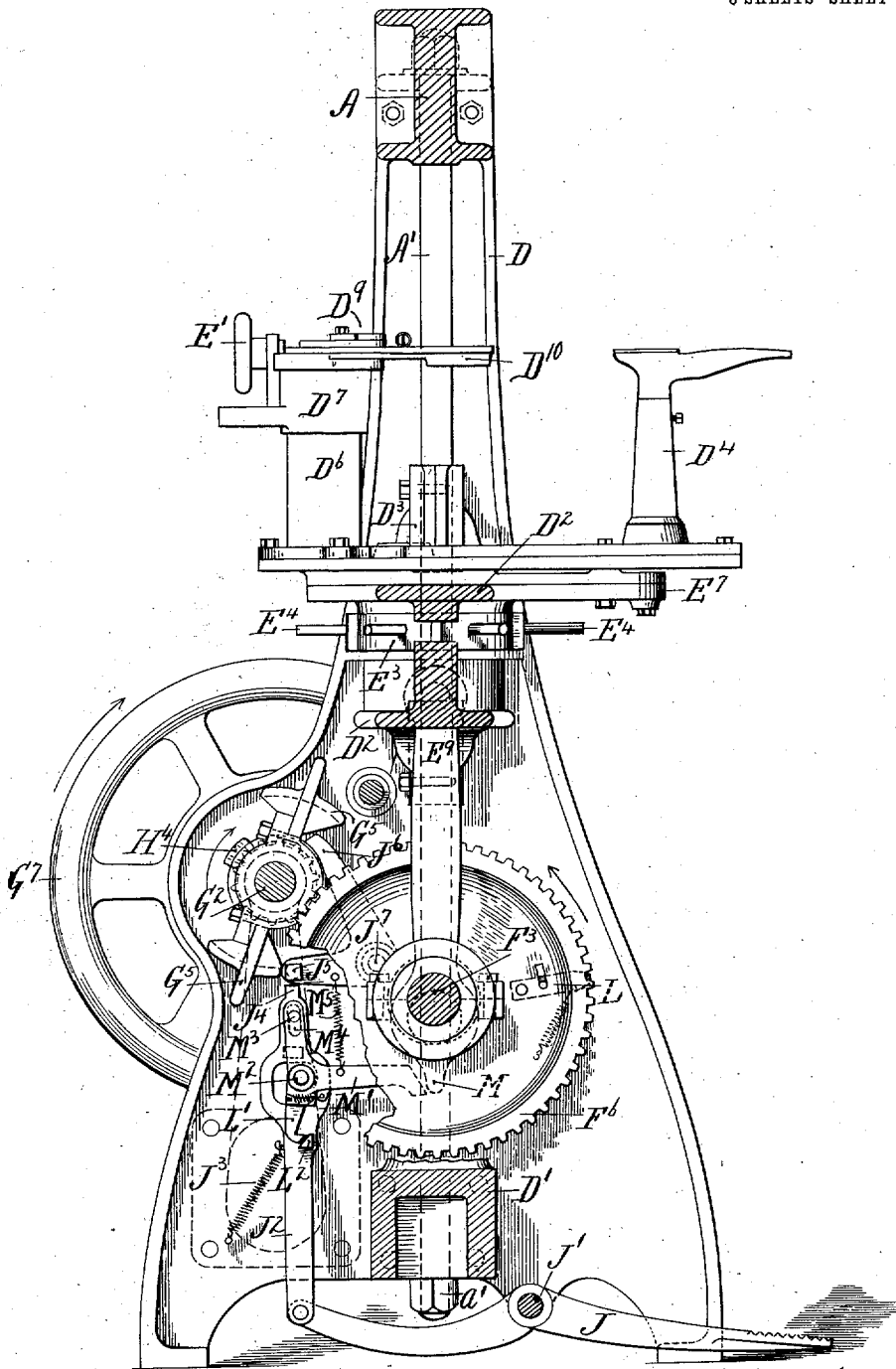
Inventor:
Erasmus Woodward
By J. R. Rush
att'y

E. WOODWARD.
HEEL ATTACHING MACHINE.
APPLICATION FILED JUNE 6, 1901.

1,019,398.

Patented Mar. 5, 1912.

8 SHEETS—SHEET 7.



Witnesses:
A. L. Hussey
V. M. MacLellan.

Fig. 21

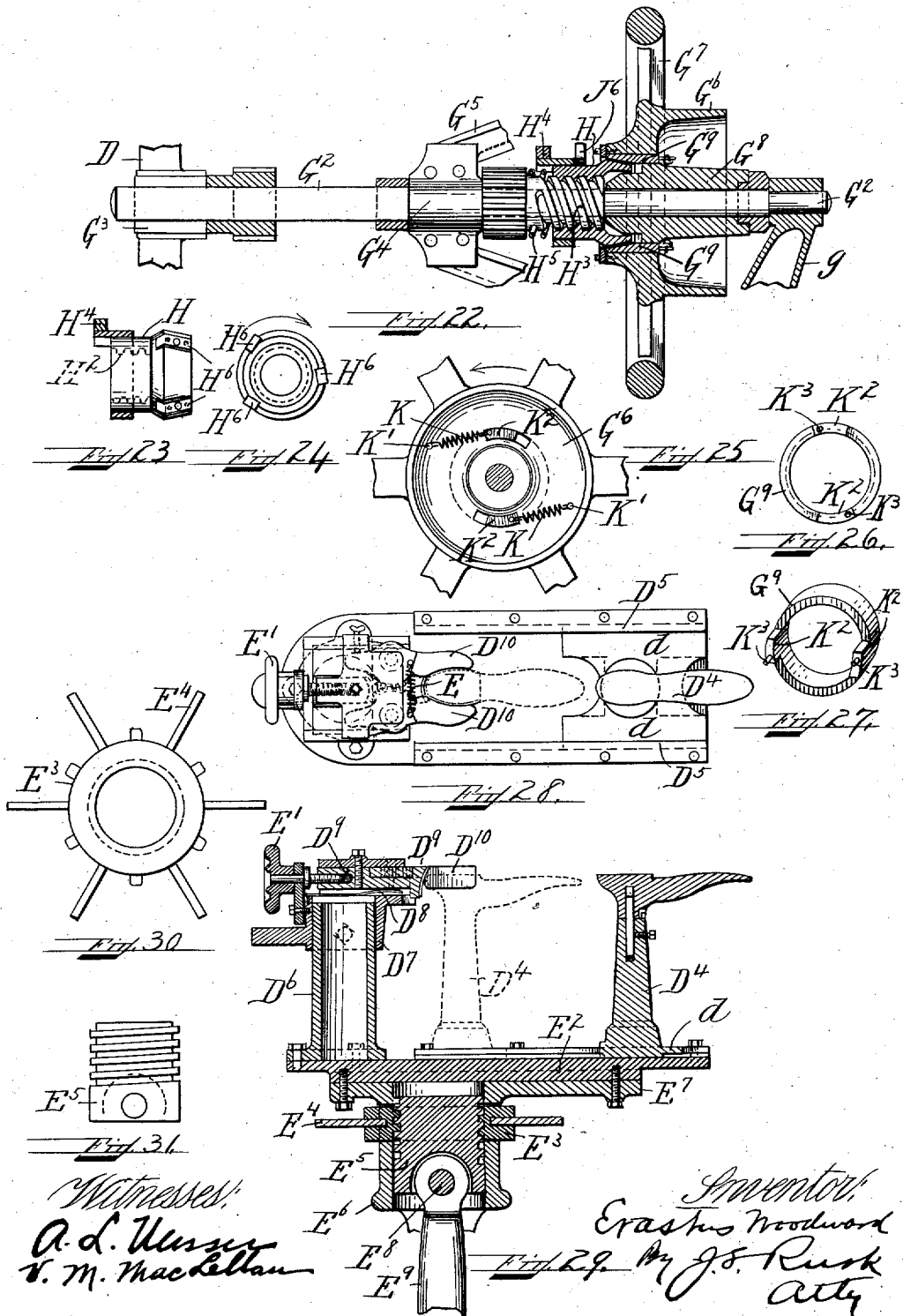
Inventor:
Erasmus Woodward
J. S. Rust
att

E. WOODWARD.
HEEL ATTACHING MACHINE.
APPLICATION FILED JUNE 6, 1901.

1,019,398.

Patented Mar. 5, 1912.

8 SHEETS—SHEET 8.



UNITED STATES PATENT OFFICE.

ERASTUS WOODWARD, OF SOMERVILLE, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

HEEL-ATTACHING MACHINE.

1,019,398.

Specification of Letters Patent.

Patented Mar. 5, 1912.

Application filed June 6, 1901. Serial No. 63,385.

To all whom it may concern:

Be it known that I, ERASTUS WOODWARD, of Somerville, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Heel-Attaching Machines, of which the following is a specification.

My invention relates to new and useful improvements in heel attaching machines and especially to that class of machines where the heels are previously loaded with nails on another machine of the character shown, described and claimed in U. S. Letters Patent No. 11,486 reissued April 16, 1895.

One object of my invention is to produce a machine for attaching heels quickly, easily, and accurately. To that end, the carriers or blocks for the heel and top lift are arranged to have a relatively short movement to and from their operative positions. This movement may be so slow and so easy that there is little liability that the heel or top lift will be thrown off, and yet more time than heretofore is given the operator for loading them upon their respective carriers. Preferably, the heel and top lift carriers are mounted to swing horizontally and also vertically so that they may be presented conveniently in receiving position to the operator, who has ample working space for putting the heels and top lifts in place before they are swung into attaching position and also for getting at the various parts connected with these carriers in order to make adjustments or repairs.

A further object of my invention is to produce a machine in which the heels are attached squarely to the heel seat by providing a rigid head so that during the attaching operation the heel and top lift blocks will not tilt but will maintain a fixed position, so that the pressure on the heel is equally distributed, thus providing for the attaching of the heel squarely on the heel seat even though there has been more leather lasted on one side than on the other, as a square blow will flatten out all extra thickness.

The invention also comprises other features, details of construction, arrangements

and combinations of parts now to be described in detail and particularly pointed out in the claims.

In the accompanying drawings which 55 illustrate a construction embodying my invention, Figures 1 and 2 are respectively front and rear elevations of the attaching head. Fig. 3 is a rear view of part of the attaching head showing the jack and shoe 60 raised in the attachment of the heel. Fig. 4 is a front elevation of part of the attaching head after the shoe and jack are moved downwardly and showing the heel attached to the shoe. Fig. 5 is a rear view of the attaching head after the shoe and jack are 65 moved downwardly and showing the heel attached to the shoe, and with the spanker block swung into place for the attachment of the top lift. Fig. 6 is a rear view of part 70 of the attaching head and showing the jack and shoe raised for the attachment of the top lift. Fig. 7 is a similar view to Fig. 6 and showing the shoe lowered with the top lift attached to the heel and showing the 75 heel on the heel block to be attached to the next shoe. Fig. 8 is a top plan view of the attaching head. Fig. 9 is a top plan view of the plate pivoted on the attaching head. Fig. 10 is a bottom plan view of the pivoted 80 plate with the top lift and spanker blocks removed. Fig. 11 is a part elevation and part sectional view of part of the attaching head showing the bearing for the horizontal moving plate with the stationary gear in its position. Fig. 12 is a cross sectional view through 85 the attaching head and showing certain parts in their positions. Figs. 13 and 14 are detail views of the stationary gears and the gears that swing around them for moving the heel 90 block and top lift spanker block in and out of position. Fig. 15 is a sectional view of the horizontal swinging plate carrying the heel block and top lift spanker block and showing the shaft in elevation. Fig. 16 is a 95 rear end view of the heel block carrier and gear. Fig. 17 is a side elevation of the parts shown in Fig. 16. Fig. 18 is a sectional view on the line X X Fig. 17 looking in the direction indicated by the arrow. Figs. 19 100 and 20 are respectively front and rear elevations of the heel attaching machines

showing the mechanism for raising and lowering the jack and shoe for attachment of the heel and top lift but omitting for clearness parts of the attaching head. Fig. 21 is a sectional view on the line X' X' Fig. 19 looking in the direction indicated by the arrow. Fig. 22 is a detail view partly in section of the clutch mechanism. Figs. 23 and 24 are side and end views of the clutch nut. Fig. 25 is a detail view looking into the driving pulley. Figs. 26 and 27 are respectively end and perspective views of the clutch ring in the driving pulley. Figs. 28 and 29 are respectively top and longitudinal sectional views of the jack and centering devices. Fig. 30 is a plan view of the adjusting nut for raising and lowering the jack and showing the centering devices; and Fig. 31 is a detail view of the screw plug.

Like letters of reference refer to like parts throughout the several views.

The machine comprises a fixed cross beam A secured at the top on the rods A' and the side pieces D. On the rear side of the cross beam A are two lugs A² in which is journaled the shaft A³, held in position by the washer A⁴ and bolt A⁵ but free to turn in said lugs, and secured on its lower end is a movable attaching head A⁶, Figs. 12 and 15. Journaled in said attaching head A⁶ by the fixed shaft A⁷ is the top lift holding block A⁹ to which is secured the top lift spanker block A¹¹; also journaled in said attaching head A⁶ by the fixed shaft A⁸ is the heel block carrier A¹⁰ to which is adjustably secured the heel block A¹², which heel block is of the construction shown in Letters Patent #627,741 and may be secured on said supporting block by any suitable means, and the top lift spanker block can also be secured by suitable set screws and a dovetailed joint to the supporting block A⁹ in a manner well known in the art. The heel block carrier A¹⁰ located around the shaft A⁸ has a hub A¹³ around which is located the hub A¹⁴ having a gear A¹⁵, and on the shaft A⁷ on which is journaled the top lift block A¹¹ by means of its supporting block A⁹, is located a hub A¹⁶ provided with a gear A¹⁷. These gears A¹⁵ and A¹⁷ are respectively the right and left gears and they mesh with the stationary gears A¹⁸ A¹⁹ formed on the plate A²⁰ which is secured to the lower lug A², extending horizontally from the cross beam A, by the screw A²³, Fig. 12. These gears A¹⁸ A¹⁹ are on the same center while the gears A¹⁵ A¹⁷ are on different centers from each other and from the gears A¹⁸ A¹⁹, and the gears A¹⁵ A¹⁷ move bodily. The attaching head A⁶ is provided with a handle B by which it may be swung in a horizontal plane and when the parts are in the position shown in Fig. 4 the operator presses down on the lever B' against the spring B² and raises the catch B³

from engagement with the recess B⁴ in the attaching head A⁶, and taking hold of the handle B moves the attaching head horizontally toward the right which brings the top lift block over the heel on the shoe as shown in Fig. 5. In this movement of the attaching head A⁶ which carries the fixed shafts A⁷ A⁸ with their respective top lift spanker and heel attaching blocks, while the heel block is moving from an operative position, the stationary gear A¹⁹ causes the heel block to swing on the shaft A⁸, and at the same time, the top lift block moving from an inoperative to an operative position, the stationary gear A¹⁸ causes the spanker block to swing on the shaft A⁷ by the meshing of the gear A¹⁷. When the top lift block A¹¹ has reached the position shown in Fig. 5 the heel attaching block A¹² is moved to the position shown in Figs. 5 and 6 and upon the upward movement of the jack the top lift is attached as shown in Fig. 6. This catch B³ locks the head A⁶ as previously described and holds the heel block and the top lift block firmly in position during the attaching of the loaded heel blank and the top lift. After the attachment of the top lift the jack moves downwardly as hereinafter described and the operator removes the heeled shoe and places another shoe on the jack; during this time, the attendant has applied a loaded heel A²¹ (Fig. 7) and pressing down on the arm B⁷ secured fast on the shaft B⁸ operates said shaft and lifts the catch B³ up from engagement with the recess B⁵ and taking hold of the handle B⁹ swings the attaching head A⁶ around until the catch B³ drops into the recess B⁴ with the heel block and heel above the shoe to be heeled, as shown in Fig. 1. After the heel block has reached this position the attendant applies a top lift, and the parts, as shown in Fig. 2 are in position for attaching a loaded heel to the shoe. When the heel block has moved from an operative to an inoperative position as shown in Figs. 6 and 7 the loaded heel A²¹ is applied by the attendant and secured to the heel block in the manner described in Patent #627,741, and occupies on the heel block the position shown in Fig. 7. As the attaching head A⁶ is moved toward the right by the attendant to bring the heel block over the shoe to attach a heel, the gear A¹⁷ engages with the stationary gear A¹⁸ and the top lift block is rotated from its position over the shoe to an inclined position shown in Figs. 1, 2, 3 and 4. It will be seen that the attaching head A⁶ has two raised portions B¹⁰ above the heel block and the top lift block respectively (Figs. 9 and 15) and, as each block comes into position over the shoe for attaching the heel or the top lift, the corresponding projection B¹⁰ comes under the projection B⁸ on the cross beam A and gives a solid bearing for the blow and

prevents any strain on the joints. Hence, the blocks are held firmly and squarely while the heel and the top lift are being attached.

It will be observed that in their receiving positions the top lift carrier and heel carrier are readily accessible by the attendant. As will be apparent from the drawing, the lower faces of said carriers in their receiving positions are inclined rearwardly and upwardly so that said faces are exposed to view from the rear and access to them is thus conveniently obtained. It will be seen furthermore that whatever carrier be in attaching position the other will be in convenient position to permit it to be filled by the attendant. At the same time it will be noted that the movement of the carriers between attaching and receiving positions is comparatively short so that a heel or top lift may be quickly transferred to attaching position. The short movement required to be given the carriers is also of advantage in that it tends to simplify and render more compact the construction of the machine and reduces liability of a heel or top lift being displaced from its carrier in said movement.

It will be noticed in Fig. 10 which is a bottom plan view of the attaching head A^6 that there are two raised portions B^{11} with which the upper flat surfaces b, b' of the heel block and top lift spanker block come into contact and have a solid bearing. The raised portions B^{11} and the flat surfaces b, b' have one side edge substantially in the vertical plane of the corresponding shafts A^7 and A^8 to permit the tilting of the blocks. The squared ends of the shaft A^8 are located in the recesses B^{12} and are secured to the attaching head A^6 by the bolts B^{13} which are tapped into the holes B^{14} and hold the shaft A^8 firmly in position, and the squared ends of the shaft A^7 are located in the recesses B^{15} and the bolts B^{16} are tapped into the holes B^{17} of the attaching head A^6 and hold the shaft A^7 firmly in position.

To prevent the gears being broken by the carelessness of the operator or the attendant, the gear A^{15} is not fastened permanently upon the hub A^{13} of the heel plate carrier A^{10} , but it is held in position one way by the set screw C and by the spring C' the other way, so that in case the attaching head A^6 is not turned far enough to bring the catch B^8 into the recesses B^4, B^5 and thereby square the block, the heel seat striking upon the heel will square the block and prevent breaking of the gears, and the spring C' will yield. The same arrangement is provided for the gear A^{17} in the top lift spanker block.

In this machine the jack is reciprocated and the pressure is directly in the line of operation, and by reciprocating the jack more time is allowed the attendant to locate the heels and top lifts on the attaching head

which is secured to the stationary cross beam A , and I have also provided for the simultaneous adjustment of the centering device and jack for different heights of heels and they always maintain the same relative position without any extra adjustment. The machine is tripped suddenly without having to wait any particular time for the clutch to operate as it operates instantly when the operator presses the starting treadle and stops at the fourth revolution of the main shaft and one revolution of the crank shaft. The side frames D are secured to the upper cross beam A and lower cross beam D' and in these cross beams the rods A' are secured by suitable nuts a, a' and mounted on the rods A' is the cross head D^2 by means of four sleeves D^3 and upon this cross head is mounted the jack D^4 adapted to slide in and out longitudinally in the guide ways D^5 which is dovetailed the base plate d of the jack as in common construction. To the rear of the jack is mounted the centering device D^9 carried upon a hollow hub D^6 having on its upper end the sleeve D^7 . Above said sleeve is located the spring D^8 on which rests the centering device having at its forward end the spring clamps D^{10} geared together and operated by the spring E adapted to hold the clamps inwardly around the heel seat of the shoe to be heeled. As the centering device is mounted loosely upon the sleeve to permit a slight vertical movement, the spring D^8 allows the centering device to yield downwardly slightly to prevent breakage, as in the case when the outsole of the shoe projects so as to overlap the edges of clamps D^{10} . At the rear of the centering device D^9 is an adjusting wheel E' adapted to move the centering device longitudinally so as to attach the heel at any desired point on the heel seat of the shoe. The jack and centering device being located on the same plate E^2 of the cross head D^2 are raised and lowered together for different heights of heels by means of the nut E^3 provided with pins E^4 for turning said nut. This nut works with the screw stud E^5 located in the chamber within boss E^6 of the plate E^7 which is secured by suitable bolts to the plate E^2 on which are located the jack and centering device. Pivoted to the screw stud E^5 on the pin E^8 is a pitman E^9 which extends downwardly and is provided with a cap F secured by bolts F' to the cranks F^2 mounted on the crank shaft F^3 which is supported in the caps F^4 carried by the supporting brace F^5 on the lower beam D' . Mounted on the crank shaft are two gears F^6, F^7 adapted to mesh with the gears G, G' on the main shaft G^2 having a bearing G^3 in one of the side frames D and in the bearing G^4 supported by the braces G^5 extending from the other of the side frames D . On this main shaft G^2 is a driving pulley G^6

which may be clutched to the shaft and which is cast with and forms part of the balance wheel G⁷. Located around this main shaft G² within the driving pulley G⁶ is a block G⁸ and around said block is located the clutch ring G⁹ with which and the block G⁸ the nut H coöperates, said nut H having an internal screw thread H² which meshes with the screw thread H³ on the shaft G² and located on said nut H is a stud H⁴ hereinafter described and said nut is adapted when released from its position to be thrown into engagement with the clutch ring G⁹ and block G⁸ by the spring H⁵ for the starting of the machine. On the outer end of the nut H are secured three lugs H⁶ which are adapted to engage the inner side of the clutch ring G⁹ when the nut H is released from its normal position.

When the operator presses down on the treadle J pivoted on the shaft J' the bar J² is moved upwardly against the spring J³ and its upper end J⁴ strikes the lug J⁵ in the bell crank lever J⁶ pivoted on one of the side frames at J⁷ and moves the lever J⁶ so that the nut H is released from the position shown in Fig. 22 and thrown by the spring H⁵ into contact with the clutch ring G⁹ and block G⁸ within the balance wheel G⁷. To prevent a sudden shock the clutch ring G⁹ is held in the forward position by two stiff springs K secured at K' to the pulley G⁶ and to the pins K² on the projections K² allowing the clutch ring to yield backward to prevent the sudden shock. When the projections K² are moved to their backward limit the main shaft G² starts to revolve causing the crank shaft F³ to rotate which operates the pitman E⁹ to move the jack and centering device upwardly against the heel located on the heel attaching block, the motion being communicated from the gears G G' to the gears F⁶ F⁷ which causes the pitman to move upwardly as described.

The stud H⁴ on the clutch nut H forms an involute tooth generated at the pitch line of the gear pinion G and as the stud H⁴ approaches the yielding stop L on the gear F⁶, it strikes on the receding side of the yielding stop. The point of contact of the stud H⁴ and stop L is at first substantially in the pitch surface of the meshing gears, G and F⁶, where the linear velocity is the same. Hence the stud comes into contact with the stop without any blow. However, as the rotation continues, this point of contact approaches the end of the stud or tooth H⁴ and moves inward along stop L toward the center of gear F⁶. Hence the tendency is for the stud at the point of contact to move faster than the stop L but, since the stud and stop are in contact, this is impossible and the stud is turned backwardly, causing the clutch nut H to be screwed away from the clutch ring in the drive pulley

G⁶, stopping the machine, and the bell crank lever J⁶ drops behind the nut H and prevents the clutch nut from engaging the clutch ring until the treadle is operated. In this machine when started by pushing down the treadle the main shaft makes four revolutions to one of the crank whether the operator keeps his foot on the treadle or not. When the treadle is pressed and the upright rod J² is raised the pawl L' drops under the lug L² on the upright rod J² and holds it up so that it can not return until the machine has finished its operation whether the foot is removed or not. This pawl L' is released by the cam M² (dotted lines Fig. 21) secured on the hub of the gear F⁶ striking the crank lever M' which is pivoted on the same center M² as the pawl L' thereby causing said pawl to move from under the lug L² allowing the rod to be moved down by the spring J³. On the upper end of the lever M' there is a pin M³ which works in the slot M⁴ in the upper end of the upright rod J² and moves the upper end of the rod J² from under the lug J⁵ allowing the bell crank lever J⁶ by means of the spring M⁵ to return to the position to hold the clutch nut H away from contact with the clutch ring against the spring H⁵ (Fig. 22). The operation of the clutch is substantially similar to that shown in U. S. Letters Patent #540,378 June 4, 1895 to the Woodward Mfg. Co. of Saco, Me.

The opposite coiled springs N around the rods A' balance the entire weight of the cross head D² and the mechanism thereon and hold said cross head in the position shown in Figs. 19, 20 and 21. Cast with each side frame D is a bracket O secured to the rods A' by set screws P to prevent the vibration of the said rods A' in order to have a rigid guide for the cross head D².

Having thus described the nature of my invention and set forth a construction embodying the same, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. A machine for use in the manufacture of boots and shoes, comprising a work support, a head mounted on a vertical axis to move horizontally, and a device for carrying a heel part to be attached movable relatively to said work support on a horizontal axis in said head simultaneously with its movement on said vertical axis.

2. In a heel attaching machine, a heel carrier, and means for sustaining said carrier in substantially horizontal attaching position and inclined receiving position constructed to permit said carrier to be swung simultaneously upon horizontal and vertical axes in its movement between said positions.

3. In a heel attaching machine, a carrier for receiving and carrying a heel, means for sustaining said carrier alternately in sub-

stantially horizontal attaching position and inclined receiving position constructed to permit the said carrier to be swung simultaneously upon horizontal and vertical axes in its movement between said positions, and means for imparting movement to said carrier.

4. In a heel attaching machine, a shoe support, a head mounted above the support for movement in a plane substantially parallel to the heel seat face of a shoe sustained upon said support, and a carrier for receiving and carrying the part to be attached to the shoe, said carrier being pivotally sustained upon said head for movement about an axis parallel to the plane of movement of the head during the movement of said head.

5. In a heel attaching machine, a head mounted for horizontal movement, and a heel carrier and a top lift carrier pivotally mounted for vertical movements upon said head during said horizontal movement.

6. In a heel-attaching machine, a head movable in a horizontal plane, a heel carrier and a top lift carrier, each mounted upon a horizontal axis in said head, and means for alternately tilting said carriers into and from operative position by the movement of said head.

7. In a heel attaching machine, a movable attaching head, and a heel block and a top lift block mounted on said head on axes inclined to each other and movable thereon.

8. In a heel-attaching machine, a cross beam, a head movably mounted in said beam, a heel block and a top lift block provided respectively with means for carrying a loaded heel and a top lift, said blocks depending from said head and being pivoted therein, and cooperating mechanism for attaching a heel to a shoe and for subsequently attaching a top lift to the attached heel.

9. In a heel attaching machine, a jack for carrying the shoe to be heeled, a cross beam, a heel block, a top lift block, an attaching head pivoted to said cross beam and having shafts on which the said blocks are journaled and adapted to successively move said blocks from an inoperative position to an operative position over the shoe to be heeled, means for tilting said blocks upon movement from an operative to an inoperative position to receive a heel and top lift, and mechanism for raising and lowering said jack for attaching the heel to the shoe and for subsequently attaching a top lift to the attached heel.

10. In a heel attaching machine, a heel block, a top lift block, an attaching head for carrying said blocks and adapted to successively bring said blocks from an inoperative to an operative position for the attachment of the heel and top lift, means for tilting said blocks in said head upon movement from an operative to an inoperative

position to receive a heel and top lift, a jack for carrying the shoe to be heeled, and mechanism for raising said jack to first attach a heel and subsequently attach a top lift to the attached heel.

11. In a heel attaching machine, a jack for carrying the shoe to be heeled, a cross beam, a heel block carrier provided with a gear, a top lift block carrier provided with a gear, a stationary gear with which said gears are adapted to mesh and to tilt said carriers into position to receive a heel and top lift, an attaching head movable on said beam and provided with shafts upon which the heel block carrier and top lift block carrier are journaled and adapted to successively move said carriers from an inoperative to an operative position over the shoe to be heeled, and cooperating mechanism for attaching the heel to the shoe and for subsequently attaching a top lift to the attached heel.

12. In a heel attaching machine, a heel block provided with means for holding and carrying a loaded heel, an attaching head mounted on a vertical axis and movable horizontally and on which said heel block is pivotally mounted and adapted to bring the heel block from an inoperative to an operative position for the attachment of the heel, a jack for carrying the shoe to be heeled, and cooperating mechanism for attaching the heel to the shoe.

13. In a heel attaching machine, a heel block provided with means for holding and carrying a loaded heel, an attaching head mounted on a vertical axis and movable horizontally and on which said heel block is pivotally mounted, said head being adapted to bring the heel block from an inoperative to an operative position for the attachment of the heel, a jack for carrying the shoe to be heeled, cooperating mechanism for attaching the heel to the shoe, and means for locking said attaching head in its attaching position over the shoe.

14. In a heel attaching machine, a heel block provided with means for holding and carrying a loaded heel, a top lift block provided with means for holding and carrying a top lift, an attaching head mounted on a vertical axis and movable horizontally and on which said blocks are pivotally mounted, said head being adapted to bring said blocks successively from an inoperative to an operative position for the attachment of the heel and top lift, a jack for carrying the shoe to be heeled, and cooperating mechanism for attaching the loaded heel and top lift to the shoe.

15. In a heel attaching machine, a heel block provided with means for holding and carrying a loaded heel, a top lift block provided with means for holding and carrying a top lift, an attaching head mounted on a vertical axis and movable horizontally and

on which said blocks are pivotally mounted, said head being adapted to bring said blocks successively from an inoperative to an operative position for the attachment of the heel and top lift, a jack for carrying the shoe to be heeled, means for tilting said blocks upon movement from an operative to an inoperative position to receive a loaded heel and top lift, and coöperative mechanism for attaching the loaded heel and top lift to the shoe.

16. In a heel attaching machine, a heel block provided with means for holding and carrying a loaded heel, a top lift block provided with means for holding and carrying a top lift, an attaching head mounted on a vertical axis and movable horizontally and on which said blocks are pivotally mounted, said head being adapted to bring said blocks successively from an inoperative to an operative position for the attachment of the heel and top lift, a jack for carrying the shoe to be heeled, means for tilting said blocks upon movement in one direction from an operative to an inoperative position to receive the loaded heel and top lift and for returning said blocks upon the movement in the opposite direction into position for attaching a loaded heel and top lift, and coöperating mechanism for attaching the loaded heel and top lift to the shoe.

17. In a heel attaching machine, a heel block provided with means for holding and carrying a loaded heel, a top lift block provided with means for holding and carrying a top lift, an attaching head mounted on a vertical axis and movable horizontally and on which said blocks are pivotally mounted, said head being adapted to bring said blocks successively from an inoperative to an operative position for the attachment of the heel and top lift, a jack for carrying the shoe to be heeled, means for tilting said blocks upon the movement from an operative to an inoperative position to receive a loaded heel and top lift, coöperating mechanism for attaching the loaded heel and top lift to the shoe, and means for locking said attaching head in its attaching position over the shoe.

18. In a heel attaching machine, a heel block provided with means for holding and carrying a loaded heel, a top lift block provided with means for holding and carrying a top lift, an attaching head mounted on a vertical axis and movable horizontally and on which said blocks are pivotally mounted, said head being adapted to bring said blocks successively from an inoperative to an operative position for the attachment of the heel and top lift, a jack for carrying the shoe to be heeled, means for tilting said blocks upon movement in one direction from an operative to an inoperative position to receive the loaded heel and top lift and for

returning said blocks upon the movement in the opposite direction into position for attaching a loaded heel and top lift, coöperating mechanism for attaching the loaded heel and top lift to the shoe, and means for locking said attaching head in its attaching position over the shoe.

19. In a heel attaching machine, a heel block provided with means for holding and carrying a loaded heel, a movable attaching head on which said heel block is pivoted and adapted to bring said heel block from an inoperative to an operative position for the attachment of the heel, a jack for carrying the shoe to be heeled, means for tilting said heel block upon movement from an operative to an inoperative position to receive a loaded heel, and coöperating mechanism for attaching the loaded heel to the shoe.

20. In a heel attaching machine, a heel block provided with means for holding and carrying a loaded heel, a top lift block provided with means for holding and carrying a top lift, an attaching head on which said blocks are pivoted and adapted to successively bring said blocks from an inoperative to an operative position for the attachment of the loaded heel and top lift, a jack for carrying the shoe to be heeled, means for tilting said blocks upon movement from an operative to an inoperative position to receive a loaded heel and top lift, and coöperating mechanism for attaching a loaded heel and top lift to the shoe.

21. In a heel attaching machine, a heel block provided with means for holding and carrying a loaded heel, a top lift block provided with means for holding and carrying a top lift, an attaching head on which said blocks are pivoted and adapted to successively bring said blocks from an inoperative to an operative position for the attachment of the loaded heel and top lift, a jack for carrying the shoe to be heeled, means for tilting said blocks upon movement in one direction from an operative to an inoperative position to receive a loaded heel and top lift and for returning said blocks upon movement in the opposite direction into position to attach a loaded heel and top lift, and coöperating mechanism for attaching the loaded heel and top lift to the shoe.

22. In a heel attaching machine, a heel block provided with means for holding and carrying a loaded heel, a top lift block provided with means for holding and carrying a top lift, an attaching head on which said blocks are pivoted and adapted to successively bring said blocks from an inoperative to an operative position for the attachment of the loaded heel and top lift, a jack for carrying the shoe to be heeled, means for tilting said blocks upon movement in one direction from an operative to an inoper-

ative position to receive the loaded heel and top lift and for returning said blocks upon movement in the opposite direction into position to attach a loaded heel and top lift, coöperating mechanism for attaching the loaded heel and top lift to the shoe, and means for locking said attaching head in its attaching position over the shoe.

23. In a heel attaching machine, a heel block, a top lift block, an attaching head in which said blocks are mounted on separate axes, said head being adapted to successively bring said blocks from an inoperative to an operative position for the attaching of the heel and top lift, means for tilting said blocks on their axes during movement from an operative to an inoperative position to receive the heel and top lift, a jack for carrying the shoe to be heeled, and coöperating mechanism for attaching the heel to the shoe and for subsequently attaching the top lift to the attached heel.

24. In a heel attaching machine, a heel block, a top lift block, an oscillatory attaching head in which said blocks are each pivotally mounted adapted to successively bring said blocks from an inoperative to an operative position for the attaching of the heel and top lift, means for tilting said blocks during movement from an operative to an inoperative position to receive the heel and top lift, a jack for carrying the shoe to be heeled, coöperating mechanism for attaching the heel to the shoe and for subsequently attaching the top lift to the attached heel, and means for locking said attaching head in its attaching position over the shoe.

25. In a heel-attaching machine, a cross beam having a flat bearing surface, a movable attaching head having a coöperating flat surface, and having also on its opposite side another flat bearing portion, a tilting carrier mounted on the attaching head and having a flat raised portion to bear against the said flat portion of the attaching head during the attaching operation.

26. In a heel attaching machine, a shoe support, a head arranged for movement transverse of the sole of a shoe sustained upon said support and a heel carrier mounted upon said head and arranged for reciprocating movement directly from a substantially horizontal attaching position to an inclined receiving position at one side of the shoe.

27. In a heel attaching machine, a head having a flat bearing surface and a tilting carrier carried by said head and having a flat raised portion to bear against the said flat portion of said head during the attaching operation.

28. In a heel attaching machine, a head movable in a horizontal plane, a heel or top lift carrier mounted upon a horizontal axis

in said head, and means for tilting said carrier into and from operative position by the movement of said head.

29. A machine for use in the manufacture of boots and shoes, comprising a work support, a head mounted on a vertical axis to move horizontally, a device for carrying a heel part to be attached movably relatively to said work support on a horizontal axis in said head, and means whereby movement on one of said axis effects movement on the other of said axis.

30. In a heel attaching machine, a shoe support and an attaching head arranged for relative approaching movement, a heel carrier and a top lift carrier, separately pivoted upon said head, said carriers being arranged for alternative movement into a common attaching position, and means for correlating the movements of said carriers.

31. In a heel attaching machine a head, a part on said head provided with a flat bearing face, a top lift spanking device provided with a flat bearing face, mounted on said head to oscillate on an axis substantially parallel to the bearing face on said head, and means to move said device on said axis from top lift receiving position to a position with its flat bearing face in engagement with the flat bearing face on the head.

32. In a heel attaching machine a head provided with a flat bearing face, a top lift attaching device provided with a spanking face and a flat bearing face parallel to the spanking face, mounted on said head, and arranged to swing from top lift receiving position, in which the spanking face is exposed to the view of the attendant in a plane at an angle to the plane of the bearing face on the head, directly to top lift attaching position with its flat bearing face in engagement with the flat bearing face on the head.

33. In a heel attaching machine a cross beam, a member on said cross beam provided with a substantially horizontal flat bearing face, a top lift spanking device provided with a flat bearing face, mounted to turn on a substantially horizontal axis and arranged to swing on its axis from top lift receiving position to a position with its flat bearing face in engagement with the flat bearing face on said member, and means for swinging said device positively and directly from receiving position to position with its flat bearing face in engagement with the flat bearing face on said member.

34. In a heel attaching machine a transversely movable head, a part on said head provided with a flat bearing face, a top lift spanking device provided with a flat bearing face, mounted on said head to swing away from the bearing face on the head to top lift receiving position at an angle to the bearing face on the head and from receiving position to a position with its flat bearing

ing face in engagement with the flat bearing face on the head.

35. In a heel attaching machine a head provided with a flat bearing face, a top lift attaching device provided with a spanking face and a flat bearing face parallel to the spanking face mounted on said head, and arranged to swing from top lift receiving position in which the spanking face is exposed to the view of the attendant in a plane at an angle to the plane of the bearing face on the head, directly to top lift attaching position with its flat bearing face in engagement with the flat bearing face on the head, and means for rigidly holding said device stationary while in top lift receiving position.

36. In a heel attaching machine a head provided with a bearing face on its lower side, a top lift attaching device provided with a spanking face and a bearing face formed for engagement with the bearing face on the head, said attaching device being mounted on said head and arranged to swing from top lift receiving position in which the spanking face is exposed in a plane at an angle to the plane of said spanking face when in spanking position directly to a spanking position with its bearing face in engagement with the bearing face on the head, said attaching device having gages constructed and arranged to grip a top lift by pressure applied longitudinally of said lift.

37. In a heel attaching machine a head a part on said head provided with a flat bearing face, a top lift spanking device provided with a flat bearing face mounted on said head to oscillate on an axis substantially parallel to the bearing face on said head and mechanism mounted on said head for moving said device on its axis between top lift receiving position and a position in which its flat bearing face is in engagement with the flat bearing face on the head.

38. In a heel attaching machine a head, a part on said head provided with a flat bearing face, a top lift spanking device provided with a flat bearing face for engagement with said face on the head and having a spanking block mounted in fixed position upon said device, said device being mounted on said head to oscillate on an axis substantially parallel to the bearing face on said head between top lift receiving position and a position in which its bearing face is in engagement with the bearing face on the head.

39. In a heel attaching machine, a work support, a heel or top lift carrier movable relatively to said work support about a plurality of separate axes, and means for moving said carrier about one of said axes by movement of said carrier about another of said axes.

40. In a heel attaching machine, a work support, a heel or top lift carrier movable relatively to said work support about a plurality of separate axes, and means permitting movement of said carrier about one of said axes simultaneously with movement of said carrier about another of said axes.

41. A machine for use in the manufacture of boots and shoes, comprising a work support, a head mounted on a vertical axis to move horizontally, a device for carrying a heel part to be attached movable relatively to said work support on a horizontal axis in said head, and means whereby movement on said movement on said vertical axis effects movement on said horizontal axis.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses, this fourth day of June A. D. 1901.

ERASTUS WOODWARD.

Witnesses:

A. L. MESSER,

V. M. MACLELLAN.

Correction in Letters Patent No. 1,019,398.

It is hereby certified that in Letters Patent No. 1,019,398, granted March 5, 1912, upon the application of Erastus Woodward, of Somerville, Massachusetts, for an improvement in "Heel-Attaching Machines," an error appears in the printed specification requiring correction as follows: Page 8, line 79, strike out the words "on said movement"; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 16th day of April, A. D., 1912.

[SEAL.]

C. C. BILLINGS,
Acting Commissioner of Patents.