J. B. HADAWAY.

TACK PULLING AND TACK DRIVING MACHINE.

APPLICATION FILED SEPT. 7, 1907.

1,030,776. **Patented June 25, 1912.**

4 SHEETS—SHEET 1.

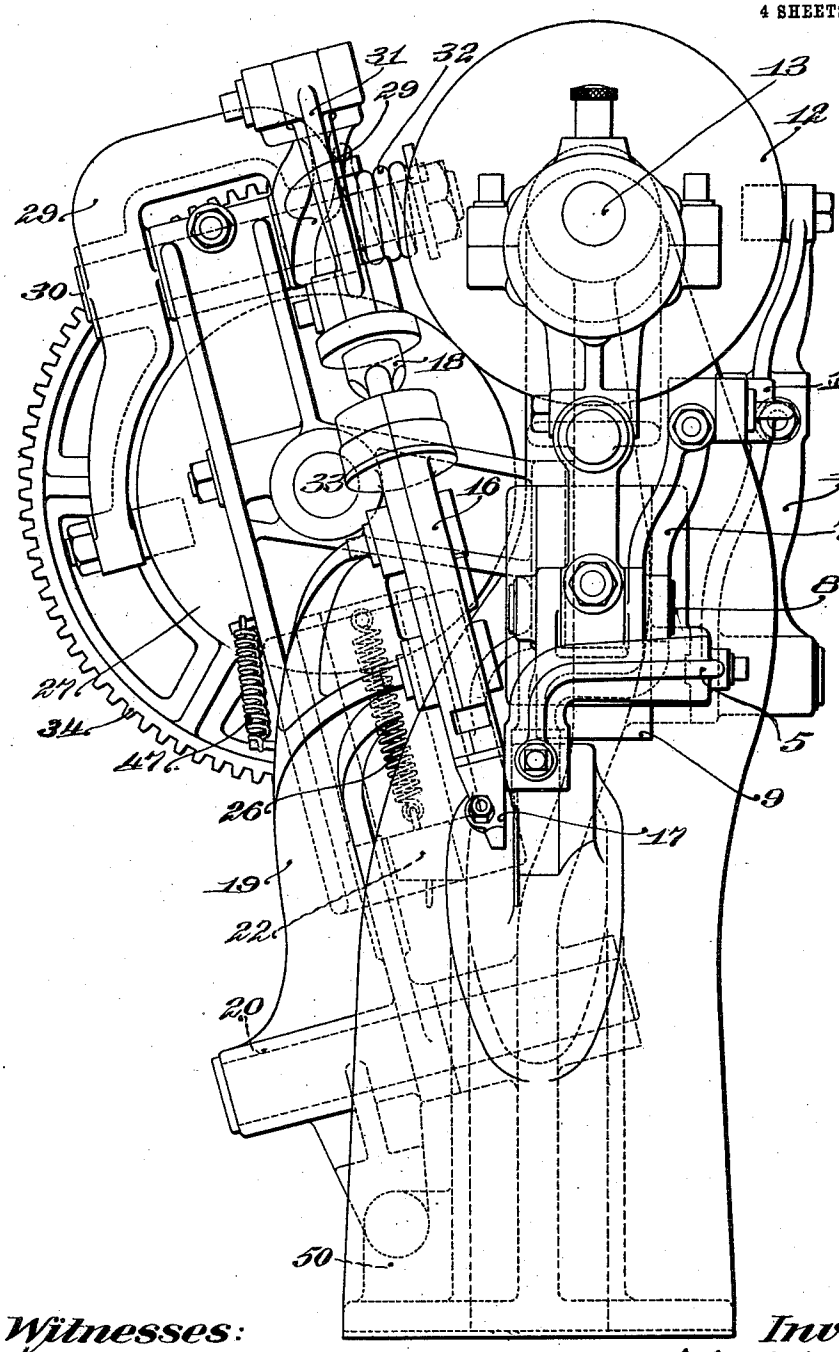

Fig. 1.

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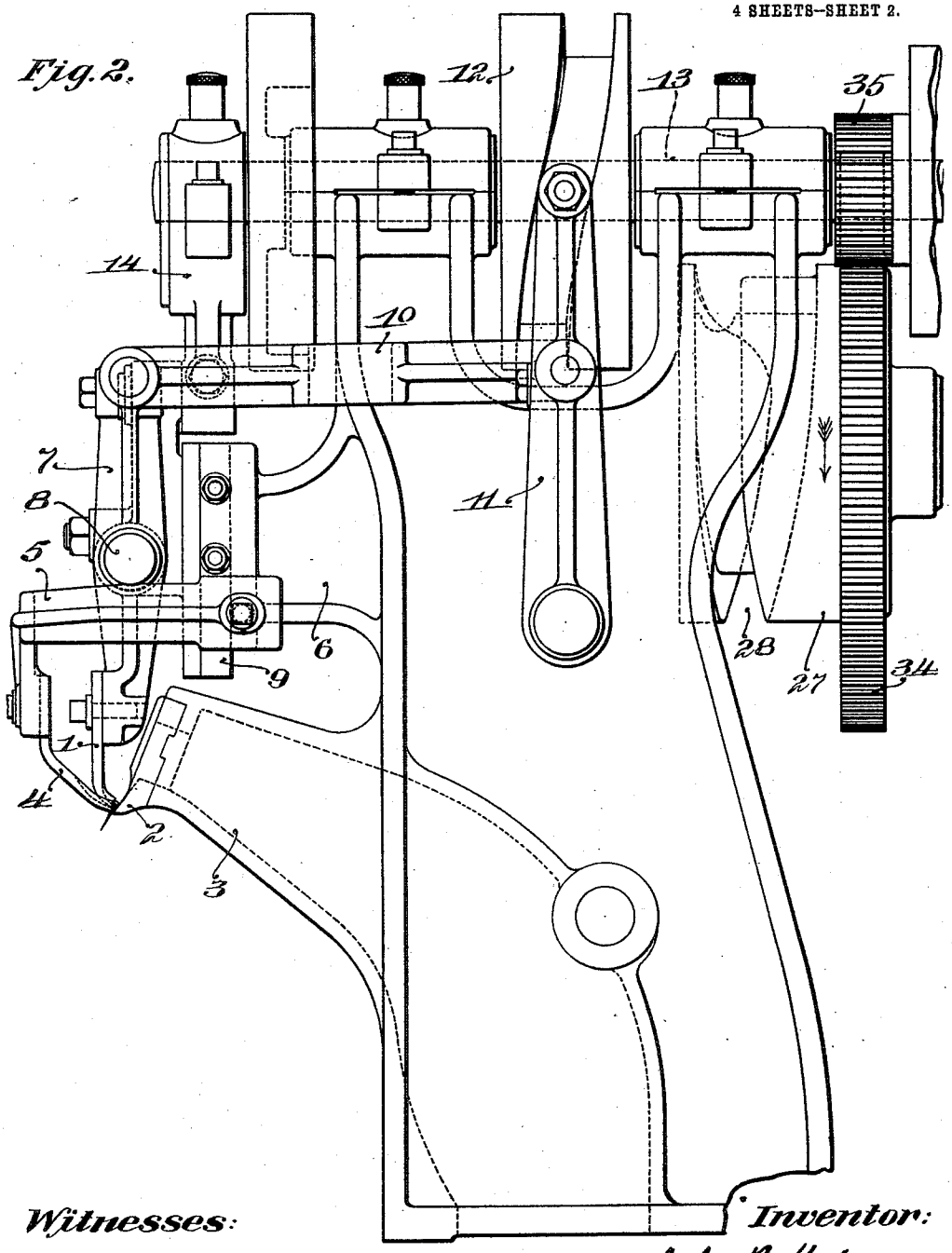
4 SHEETS—SHEET 2.

Fig. 2.



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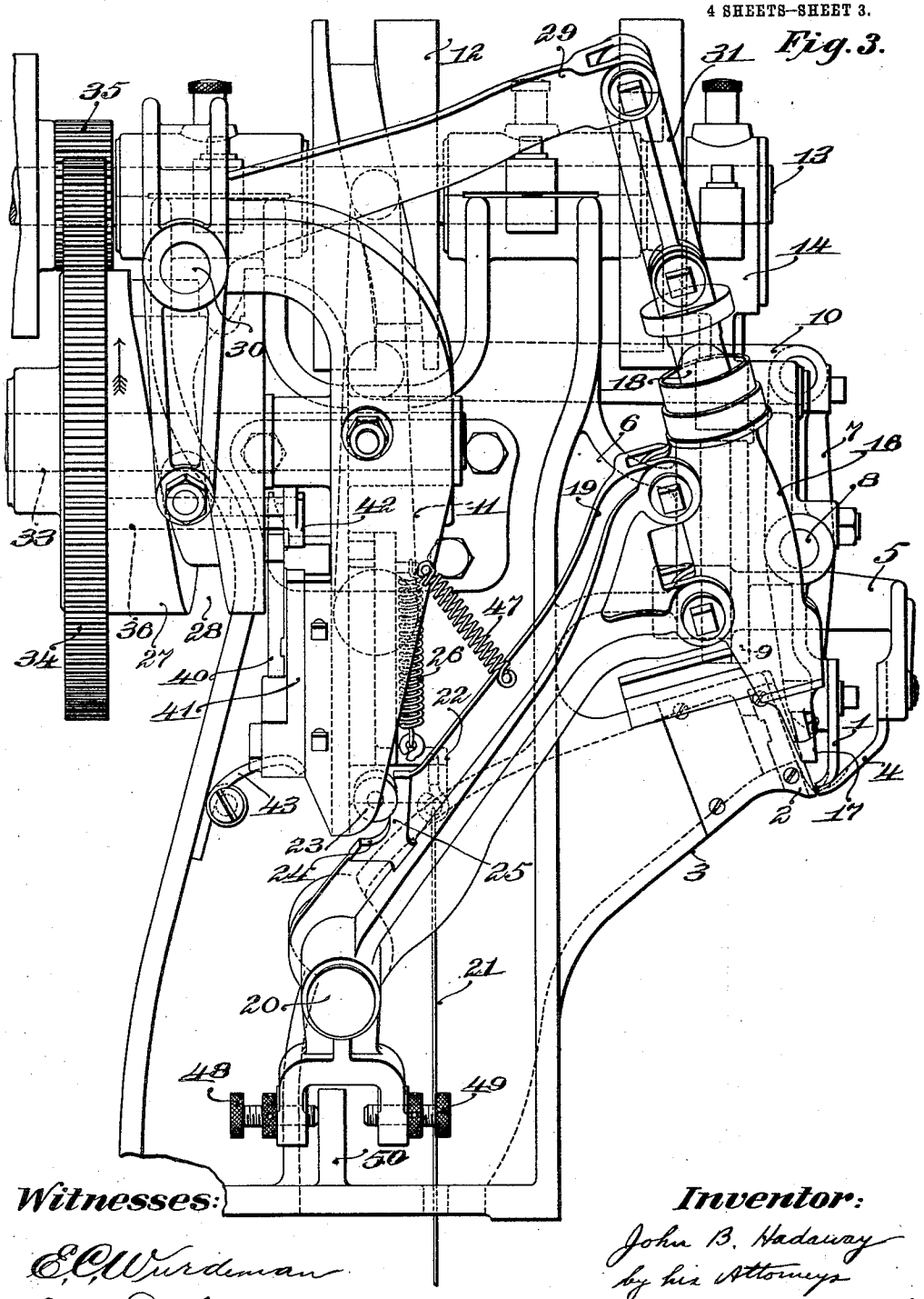
4 SHEETS—SHEET 3.

Fig. 3.



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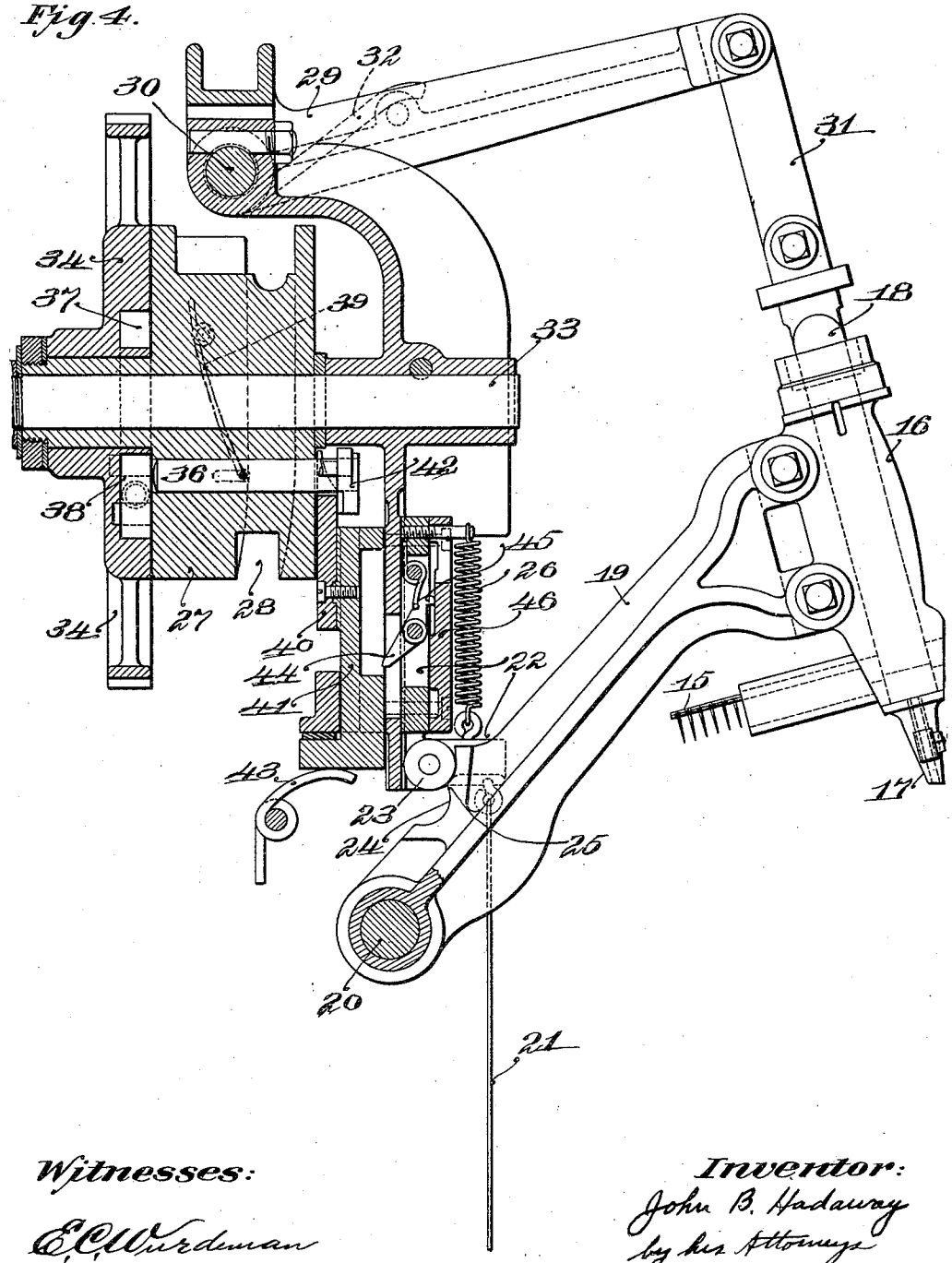
4 SHEETS—SHEET 4.

Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN B. HADAWAY, OF BROCKTON, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

TACK-PULLING AND TACK-DRIVING MACHINE.

1,030,776. Specification of Letters Patent. **Patented June 25, 1912.**

Application filed September 7, 1907. Serial No. 391,821.

To all whom it may concern:

Be it known that I, JOHN B. HADAWAY, citizen of the United States, residing at Brockton, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Tack-Pulling and Tack-Driving 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 machines which are used in the manufacture of shoes to pull the lasting tacks from a lasted shoe and to drive a less number of stay tacks therein to secure the released upper on the last and thereby prepare the shoe for the operation of the inseam sewing machine. Machines of this character comprise a tack pulling mechanism to which the lasted shoe is presented and a tack driving mechanism located at one side of the tack pulling mechanism in position to drive the requisite number of stay tacks, to secure the upper released by the tack pulling mechanism, as the shoe is fed past the tack pulling and tack driving mechanisms, the tack pulling and tack driving operations being performed during a single manipulation of the shoe by the operator.

The objects of the present invention are to provide a machine for pulling lasting tacks from a lasted shoe and driving stay tacks therein in which the tack pulling and tack driving mechanisms are arranged in an improved manner so that the shoe can be more readily manipulated by the operator and the action of the tack pulling and tack driving mechanisms more easily observed, to provide a machine having its various parts constructed and arranged in a simpler and more compact manner, to provide a machine by which the stay tacks can be driven closer to the point of operation of the tack pulling mechanism so as to decrease the liability of any displacement of the shoe upper on the last, and to provide a machine by which lasting tacks, which are close to the anchor tacks which secure a lasting wire at the toe of a shoe, can be pulled without liability of also pulling the anchor tacks.

With these objects in view a feature of the present invention contemplates mounting the tack driver of a machine for pulling lasting tacks from a lasted shoe and driving stay tacks therein, so that it is movable toward and from a shoe presented to the tack puller of the machine. By so mounting the tack driver it can be in a position away from the shoe except when a stay tack is to be driven and can be arranged so as not to interfere with the inspection of the work by the operator and leave the space in proximity to the point of operation of the tack puller comparatively free and open so that the operator can readily manipulate the shoe to present the tacks to the tack puller and can bring the tacks close to the anchor tacks at the toe of the shoe into the path of the tack pulling tool without also presenting the anchor tacks to the tool.

To enable the stay tacks to be driven as closely as possible to the point of operation of the tack puller, the tack driver is preferably so mounted that it not only moves toward the shoe when a stay tack is to be driven but also moves laterally toward the tack puller, this lateral movement of the tack driver permitting the tacks to be driven closer to the point of operation of the tack puller than in prior machines in which the tack driver is stationary. This lateral movement of the tack driver is believed to be new as well as the movement of the driver toward and from the shoe and is considered to constitute a feature of the present invention whether or not additional movements are imparted to the driver.

In the preferred form of the invention hereinafter described the tack driver is located at one side of the tack puller and is movable obliquely to the direction of feed of the shoe toward and from the point of operation of the tack puller so that a single movement of the tack driver moves the driver both toward the shoe and laterally toward the point of operation of the tack puller. This arrangement of the tack driver not only permits the use of a simple construction for supporting and moving the tack driver but also permits the tack driver and tack puller to be arranged in a compact manner and enables the tack to be driven in close proximity to the point of operation of the tack puller.

The tack driver may be of any suitable construction and in the machine hereinafter specifically described is of well known form and includes a tack driving plunger. This

tack driving plunger moves obliquely to the direction of feed toward the point of operation of the tack puller in driving a tack. This arrangement of the tack driving plunger of a tack pulling and driving machine is believed to be new and is considered to constitute a feature of the present invention whether or not the tack driver is mounted to move toward and from the shoe.

In addition to the features of invention above referred to, the present invention also consists in certain devices, combinations and arrangements of parts tending to simplify and improve the construction and mode of operation of tack pulling and driving machines, the advantage of which will be obvious to those skilled in the art from the following description of the preferred form of the invention.

A tack pulling and driving machine embodying the various features of the present invention in their preferred form is illustrated in the accompanying drawings in which—

Figure 1 is a view in front elevation of the machine; Fig. 2 is a view in side elevation illustrating particularly the tack pulling mechanism, the parts of the tack driving mechanism which would appear in this view being omitted for the sake of clearness; Fig. 3 is a view in side elevation of the opposite side of the machine to that illustrated in Fig. 2, illustrating particularly the construction and arrangement of the tack driving mechanism; and Fig. 4 is a longitudinal sectional view of the power driven mechanism by which the tack driver is actuated, said view showing the tack driver and its supporting arm in side elevation.

The machine illustrated in the drawings is provided with a tack puller for removing the lasting tacks from a shoe, with constantly running power driven mechanism for actuating the tack puller, with a tack driver located at one side of the tack puller in the direction in which the shoe is fed, with means for supporting the tack driver to allow it to move obliquely to the direction of feed toward and from the shoe and toward and from the point of operation of the tack puller, with normally idle power driven mechanism for actuating the tack driver, and with a treadle and suitable connections whereby the operator can move the tack driver toward the shoe at the desired times during the operation of the machine and throw the power-driven mechanism for actuating the tack driver into operation.

The tack puller of the machine illustrated in the drawings, together with the mechanism for actuating the puller and the parts associated with the puller for supporting and guiding the shoe, are the same in construction and mode of operation as the corresponding parts disclosed in applicant's prior application for a tack pulling machine, filed September 9, 1905, Serial No. 277,653. As best shown in Fig 2, the tack puller comprises a tack pulling tool 1 moving in a substantially elliptical path and in a plane transverse to the direction in which the shoe is fed and to the line of lasting tacks. Coöperating with the movable jaw 1 is a stationary jaw 2 which forms a work support to bear against the shoe upper at one side of the line of last-tacks, and which supports a tack against the thrust of the movable jaw while the tack is being removed from the shoe. This stationary jaw is formed upon the lower portion of a plate secured to the forward end of a hollow projection 3 from the frame of the machine, which projection forms a chute into which the tacks are thrown by the movable jaw 1 and through which they pass downwardly through the hollow frame into a suitable receptacle. A foot 4 is arranged to press upon the shoe upper upon the opposite side of the line of lasting tacks from the stationary jaw 2 and forms a work support and guard to press down the upper beneath the movable tack pulling jaw and prevent the jaw from injuring the upper. The foot 4 is secured to a bracket 5 which is bolted to a projection 6 upon the machine frame above the hollow projection 3. The movable tack pulling jaw 1 is secured upon the lower end of a lever 7 pivoted at 8 upon a slide 9 mounted to reciprocate in a vertical guideway in the projection 6 of the machine frame. To cause the working end of the movable tack pulling jaw to move in the desired path oscillating movements are imparted to the lever 7 and reciprocating movements to the slide 9. To oscillate the lever 7 a link 10 is pivotally connected at one end to the upper end of the lever and at its other end to a lever 11, the upper end of which is provided with a roll engaging a suitably-shaped groove in a cam disk 12 secured to the main driving shaft 13 of the machine. The necessary reciprocating movements are imparted to the slide 9 by means of an eccentric upon the forward end of the driving shaft 13 which is connected to the slide by means of an eccentric strap and link 14.

The tack driver of the machine illustrated in the drawings is of well-known construction and for this reason has not been shown in detail. It is what is known in the art as a strip tacker and is adapted to drive successively a series of tacks supported upon a paper strip. This strip, provided with a series of tacks, is indicated at 15 in Fig. 4, projecting from a guideway at the lower end of the tack driver. The casing of the tack driver is indicated at 16 and the nozzle

through which the tacks are driven at 17. The tack driving plunger which reciprocates within the casing 16 is indicated at 18, and this plunger is connected to power driven mechanism by which it is actuated at the desired times during the operation of the machine, as will be hereinafter described. To enable the tack driver to be normally in a position away from the shoe and to permit it to be moved toward the shoe when a stay tack is to be driven, the casing of the tack driver is bolted upon the forward end of an arm 19 pivotally mounted upon a stud 20 projecting from the side of the machine frame.

As is clearly shown in Fig. 1, the casing of the tack driver is arranged in an inclined position so that its upper end is much farther away from the vertical plane in which the movable tack pulling jaw operates than its lower end. By arranging the tack driver in this manner, the lower end of the casing is brought much nearer the point of operation of the tack puller than would otherwise be possible. To cause the lower end of the tack driver casing to approach still more closely to the point of operation of the tack puller when a stay tack is driven, the pivot stud 20 upon which the arm 19 is mounted is arranged obliquely, as indicated in Fig. 1, so that the bodily movement of the tack driver when the arm is depressed is oblique to the direction in which the shoe is fed, and the lower end of the tack driver casing not only moves toward the shoe but also laterally toward the point of operation of the tack puller. The arm 19 is depressed by means of a foot treadle which is connected by a rod 21 to a spring-supported slide 22 mounted in guideways in the frame of the machine. Upon its lower end the slide 22 is provided with a roll 23 arranged to contact with a bearing surface 24 upon the upper side of the arm 19. The bearing surface 24 is divided into two parts by a projection 25, and is so shaped, as illustrated in Fig. 4, that during the first portion of the downward movement of the slide 22 the arm 19 will be swung downwardly and thereafter further downward movement of the slide will be permitted without producing any further downward movement of the arm. The downward movement by the slide 22 while the arm 19 is stationary is utilized to throw the power driven mechanism for actuating the tack driver into operation as will be described. Upon the release of the treadle the slide 22 is returned to its original position by means of a spring 26 connecting the projection at the lower end of the slide with a pin secured in the machine frame.

The power driven mechanism for actuating the tack driver comprises a cam 27 provided with a cam groove 28, a bent lever 29, pivotally mounted upon a stud 30 secured in the frame of the machine and having one arm provided with a roll engaging the cam groove 28 and the other arm connected by a link 31 to the tack driving plunger 18, and a spring 32 coiled around the stud 30 and acting to depress the arm of the lever 29 when permitted to do so by the cam groove 28. Each time the cam disk 27 is thrown into operation it makes one complete revolution and the cam groove 28 in the disk is so shaped, as indicated in the drawings, that the lever 29 is released to allow the spring 32 to quickly actuate the lever to depress the tack driving plunger and thereafter the lever is actuated by the cam against the tension of the spring to raise the tack driving plunger. The cam disk 27 is mounted to rotate loosely upon a stud 33 mounted in the machine frame at one side of and below the main driving shaft, and the disk when thrown into operation is driven from a constantly rotating gear 34 mounted to rotate loosely upon a sleeve extending from the cam disk and meshing with a pinion 35 upon the main driving shaft. To connect the cam disk 27 to the gear 34 a suitable clutch is provided, which, as indicated in Fig. 4, comprises a pin 36 mounted to slide longitudinally in the disk and arranged to enter an arc-shaped slot 37 in the face of the gear 34 and engage an abutment 38 at one end of the slot. The pin 36 is acted upon by a spring 39 which tends to move the pin in a direction to engage the slot in the gear 34. The pin 36 is controlled in its movements by means of a clutch controller which, as indicated in Fig. 4, consists of a block 40 secured upon a slide 41, the upper end of the block being wedge-shaped and adapted when in its raised position to engage the head 42 of the pin 36 and withdraw the pin from engagement with the gear 34.

It is desirable in machines of the class to which the present invention relates that means be provided for preventing more than one actuation of the tack driver when the power driven mechanism is thrown into operation, and in the machine illustrated in the drawings this result is accomplished by automatically releasing the slide 41 after it has been depressed so that it may be immediately raised by the spring 43 bearing against the lower end of the slide to return the block 40 into the path of movement of the head 42 of the clutch pin 36. In the construction illustrated in Fig. 4 a spring-pressed pawl 44 is mounted upon the slide 22 hereinbefore described as acting when depressed to move the tack driver toward the shoe. This pawl is arranged to engage a shoulder on the slide 41 and depress the slide during a portion of the downward movement of the slide 22. The pawl 44 is

provided with an arm 45 which bears against a plate 46 forming a portion of the guideway for the slide 22, and which, just before the slide 22 completes its downward movement, strikes a shoulder on the plate 46 so that the pawl 44 is removed from engagement with the shoulder on the slide 41, and the slide is permitted to return to its normal position. At each actuation of the treadle, therefore, to move the tack driver toward the shoe, the clutch controller 40 is moved out of its normal position and then automatically released so that the cam disk 27 makes but a single revolution whether or not the treadle is kept depressed by the operator, and the tack driver is actuated to drive but a single tack.

The tack driver is returned to its normal position away from the shoe when the treadle is released by means of a spring 47, connected at one end to the arm 19 and at the other end to the frame of the machine. The upward and downward movements of the tack driver are limited by adjustable stop screws 48 and 49 in a portion of the arm 19 extending below its pivot, which stop screws engage opposite sides of a fixed stop 50 on the machine frame.

The operation of the machine in pulling lasting tacks from a lasted shoe and driving stay tacks therein has been indicated in connection with the description given above of the construction and arrangement of its various parts, and will be clearly understood by those skilled in the art without a separate description thereof.

The nature and scope of the present invention having been indicated, and a machine embodying the several features of the invention in their preferred form having been specifically described, what is claimed is:—

1. A machine for pullling lasting tacks from a lasted shoe and driving stay tacks therein, having, in combination, a tack puller, and a tack driver movable toward and from a shoe presented to the tack puller along a fixed path terminating in close proximity to the point of operation of the tack puller.

2. A machine for pulling lasting tacks from a lasted shoe and driving stay tacks therein, having, in combination, a tack puller, and a tack driver movable toward and from the point of operation of the tack puller along a fixed path terminating in close proximity to the point of operation of the tack puller.

3. A machine for pulling lasting tacks from a lasted shoe and driving stay tacks therein, having, in combination, a tack puller, and a tack driver located at one side of the tack puller and movable laterally toward and from the tack puller along a fixed path terminating in close proximity to the point of operation of the tack puller.

4. A machine for pulling lasting tacks from a lasted shoe and driving stay tacks therein, having, in combination, a tack puller, and a tack driver located at one side of the tack puller and movable obliquely to the direction of feed of the shoe toward and from the point of operation of the tack puller.

5. A machine for pulling lasting tacks from a lasted shoe and driving stay tacks therein, having, in combination, a tack puller, a tack driver normally away from the shoe and movable toward the shoe along a fixed path terminating in close proximity to the point of operation of the tack puller, and means controlled by the operator for moving the tack driver toward the shoe and for actuating the driver to drive a stay tack.

6. A machine for pulling lasting tacks from a lasted shoe and driving stay tacks therein, having, in combination, a tack puller, a tack driver normally away from the shoe, power driven mechanism for actuating the tack driver, and means controlled by the operator for moving the tack driver toward the shoe and for throwing said power driven mechanism into operation.

7. A machine for pulling lasting tacks from a lasted shoe and driving stay tacks therein, having, in combination, a tack puller, a tack driver normally away from the shoe, power driven mechanism for actuating the tack driver, a treadle and suitable connections acting when the treadle is depressed to first move the tack driver toward the shoe and thereafter throw said power driven mechanism into operation.

8. A machine for pulling lasting tacks from a lasted shoe and driving stay tacks therein, having, in combination, a tack puller, a tack driver located at one side of the tack puller, including a tack driving plunger movable obliquely to the direction of feed toward the point of operation of the tack puller, and means for actuating the driver to drive stay tacks less in number than the lasting tacks.

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

JOHN B. HADAWAY.

Witnesses:
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ANNIE C. RICHARDSON.