

J. B. HADAWAY.
TACK PULLING AND RESETTING MACHINE.
APPLICATION FILED APR. 8, 1911.

1,049,474.

Patented Jan. 7, 1913.

4 SHEETS—SHEET 1.

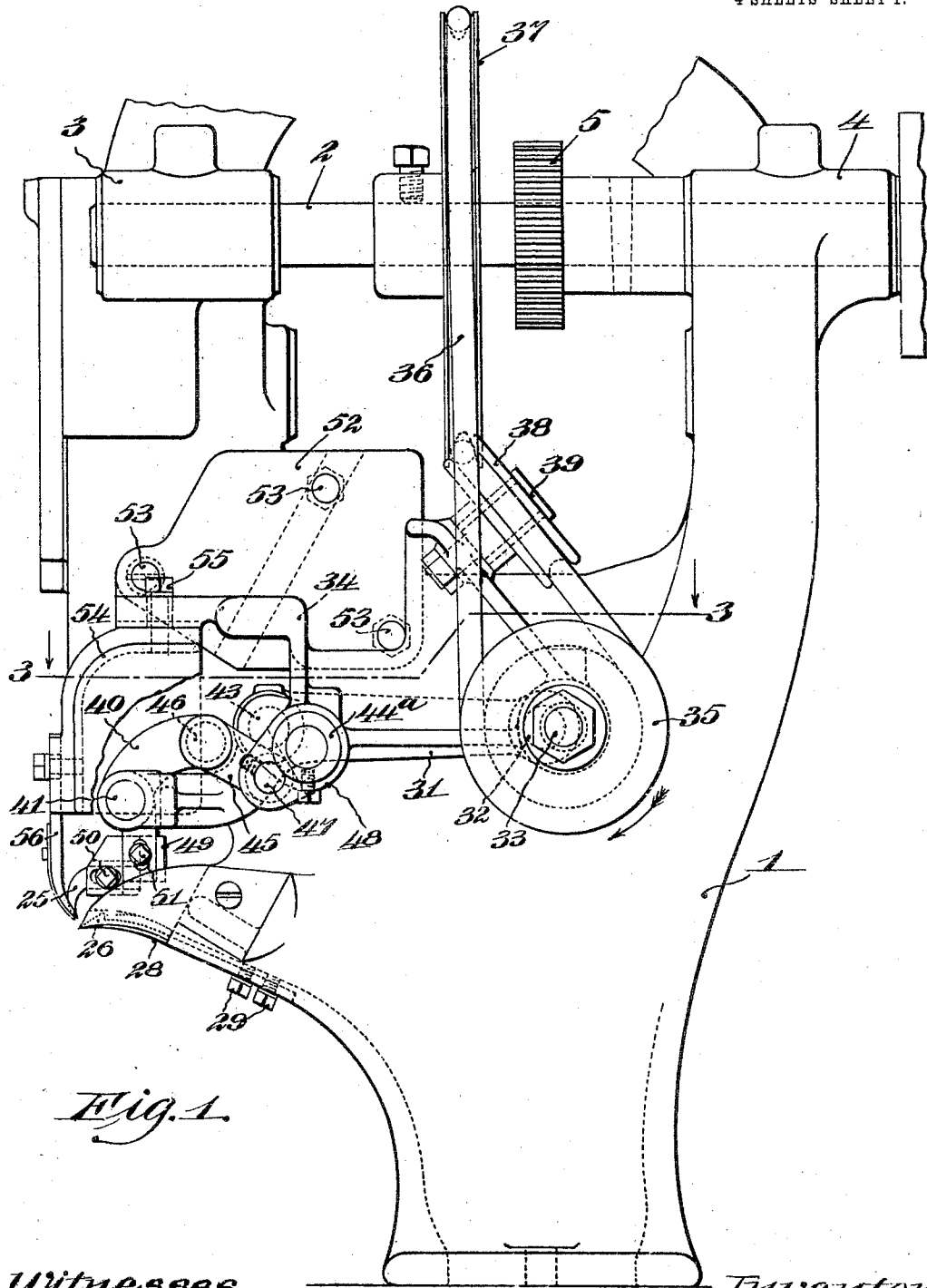


Fig. 1.

Witnesses
Edward S. Day
Barton W. Cary.

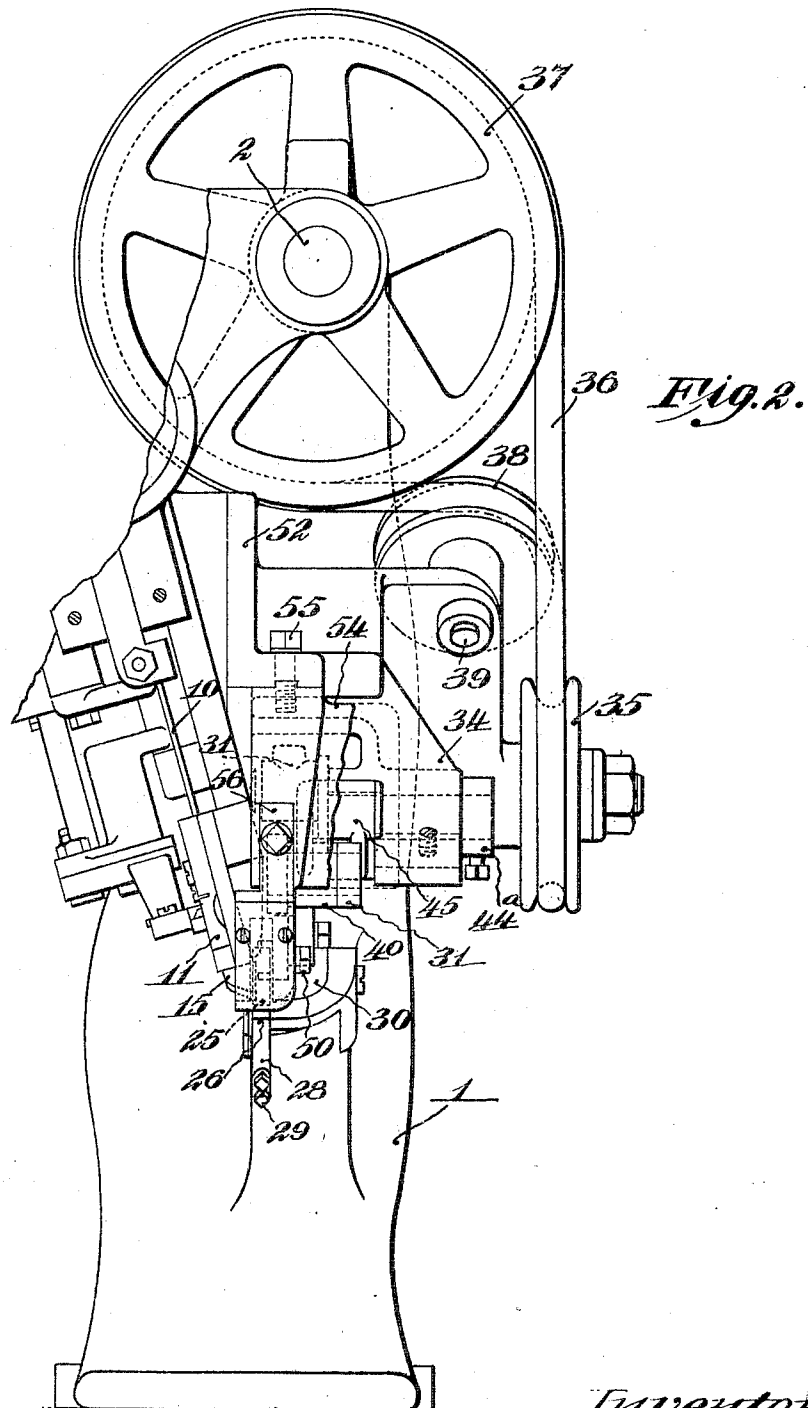
Inventor
John B. Hadaway
by his Attorneys
Phillips Van Eiman & Fish

J. B. HADAWAY.
TACK PULLING AND RESETTNG MACHINE.
APPLICATION FILED APR. 8, 1911.

1,049,474.

Patented Jan. 7, 1913.

4 SHEETS—SHEET 2.



Witnesses
Edward S. Day
Burton W. Cary.

Inventor
John B. Hadaway
by his Attorneys
Phillips Van Coven & Fish

J. B. HADAWAY.
TACK PULLING AND RESETTING MACHINE.
APPLICATION FILED APR. 8, 1911.

1,049,474.

Patented Jan. 7, 1913.

4 SHEETS—SHEET 3.

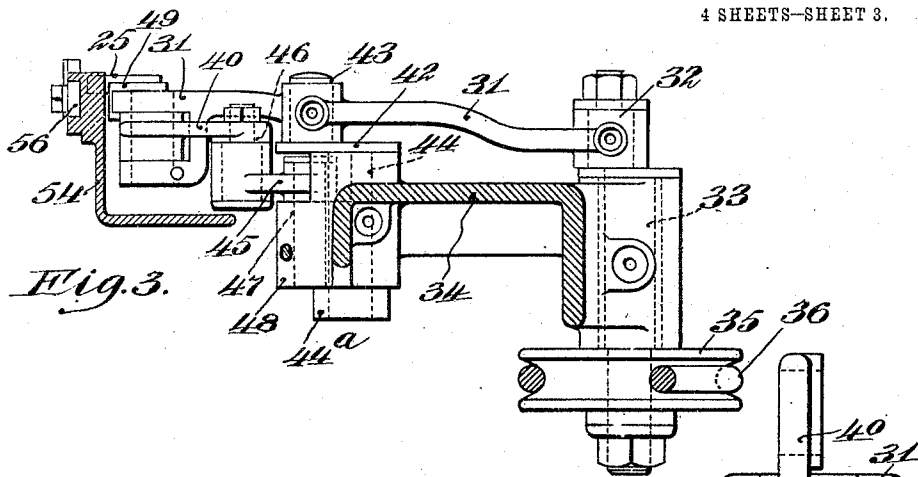


Fig. 3.

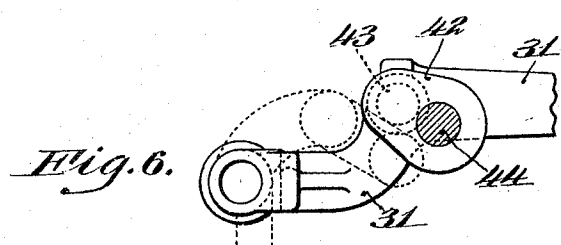


Fig. 6.

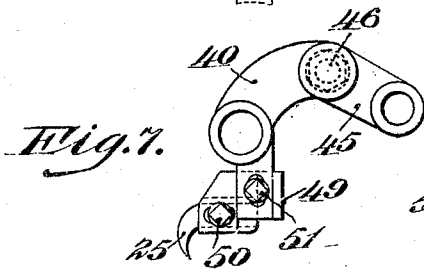


Fig. 7.

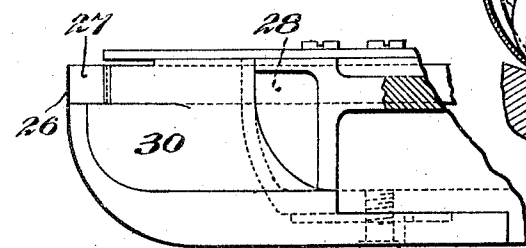


Fig. 8.

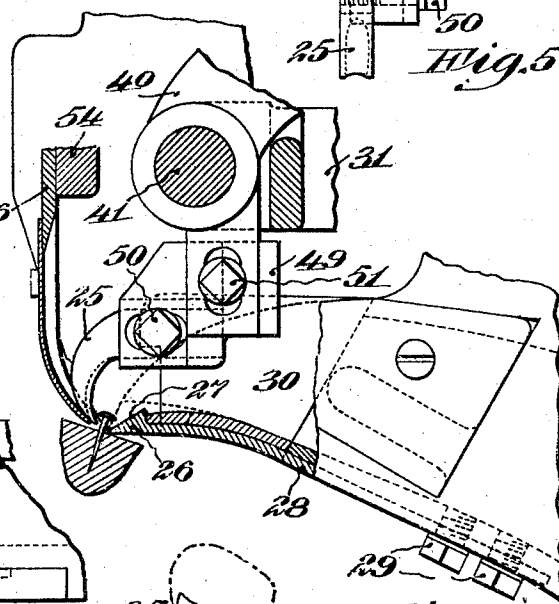


Fig. 4.



Fig. 9.

Witnesses
Edward S. Day
Benton W. Camp

Inventor
John B. Hadaway
by his Attorneys
Phillips Von Cullen & French

1,049,474.

4 SHEETS—SHEET 4.

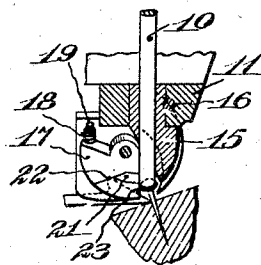
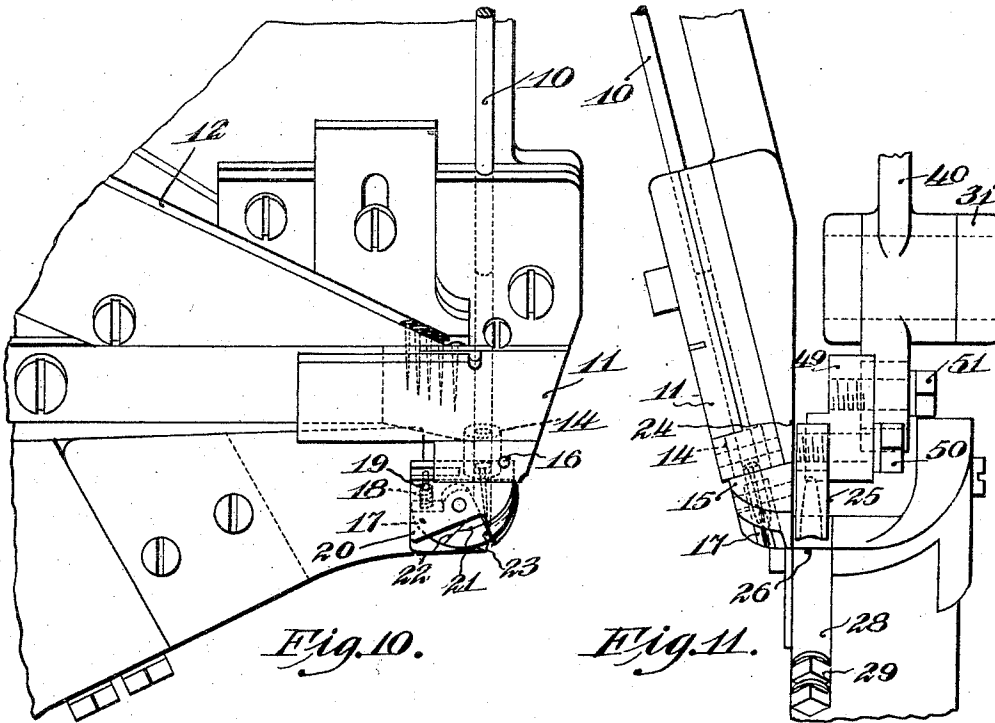


Fig. 12.

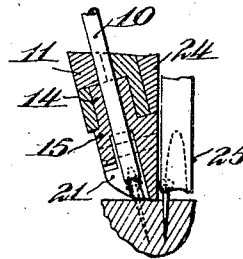


Fig. 13.

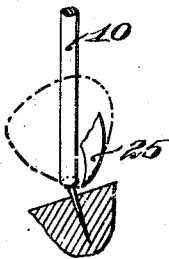


Fig. 15.

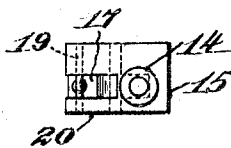


Fig. 14.

Witnesses
Edward S. Day
Benton W. Cary.

Inventor
John B. Hadaway
by his Attorneys
Phillips Van Curen & Fish

UNITED STATES PATENT OFFICE.

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

TACK PULLING AND RESETTING MACHINE.

1,049,474.

Specification of Letters Patent.

Patented Jan. 7, 1913.

Application filed April 8, 1911. Serial No. 619,736.

To all whom it may concern:

Be it known that I, JOHN B. HADAWAY, a citizen of the United States, residing at Swampscott, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Tack Pulling and Resetting 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 tack pulling and resetting machines, and more particularly to that type of machine which is employed for preparing lasted boots and shoes for the sewing operation. Machines of this general type are employed for removing the side lasting tacks from a shoe and inserting in place thereof a less number of holding tacks. These machines are arranged to remove the lasting tacks and insert the requisite number of holding tacks with a single manipulation of the shoe.

The principal object of the present invention is to improve the construction and mode of operation with a consequent increase in the efficiency, of machines of this general character.

A further object of the invention is to enable the lasting tacks to be properly positioned with relation to the tack pulling devices and removed from the shoe, and the holding tacks inserted without varying the lateral inclination of the shoe.

A still further object of the invention is to provide an improved and simplified tack pulling mechanism which is capable of a high speed of operation and which grasps and pulls the tacks with certainty and with the minimum amount of wear and tear upon the operating parts of the mechanism.

The tack driving movements and the tack pulling movements of the machine hereinafter described take place in planes inclined to one another, and in order to pull the tacks most efficiently, the shoe is presented to the tack pulling mechanism with the sole inclined laterally and substantially normal to

the plane in which the tack pulling movement takes place.

One feature of the invention contemplates the provision of means operating in conjunction with the tack driving mechanism and arranged to deflect the course of the tack sufficiently to insure that the tack is driven into the shoe substantially normal to the sole. This enables the operator to insert the holding tacks directly without the necessity of varying the lateral inclination of the shoe.

The tack pulling mechanism of the machine hereinafter described comprises a movable tack pulling jaw which moves forward over the tack to be pulled and then describes a loop in order to engage the tack and pull the tack upon the backward stroke of the tool.

A feature of the invention contemplates the provision of a simple, compact and efficient construction for giving the desired movement to the jaw consisting of a supporting arm for the jaw, a crank connected directly to one end of the arm, a supporting link for the arm connected to the arm intermediate its ends, and a tack pulling jaw dependent upon the free end of the arm and having its tack engaging end directed toward the crank. In the preferred form of the invention which is employed for removing side tacks, a cooperating stationary jaw is provided and the tack pulling movement takes place in a linear direction substantially parallel to the face of the stationary jaw. Broadly considered, however, this feature of the invention is not limited to the employment of the tack pulling jaw in combination with a cooperating jaw, nor is it limited to the employment of a jaw for removing side tacks, but contemplates the use of the jaw, if so desired, for the removal of insole tacks or fasteners which are embedded in the material with their heads flush with the surface thereof.

Still further features of the invention comprise certain novel features of construction, combinations and arrangements of parts hereinafter described and claimed, the

advantages of which will be apparent to those skilled in the art from the following description.

In the accompanying drawings illustrating the preferred form of the invention; Figure 1 is a right-hand side elevation of the machine with a portion of the inclosing cover removed, and illustrating the tack pulling mechanism within; Fig. 2 is a front elevation of the machine with the upper portion of the tack driving mechanism broken away; Fig. 3 is a section upon the line 3-3 of Fig. 1, looking in the direction of the arrows, and illustrating a plan view of the operating mechanism for the movable tack pulling jaw; Fig. 4 is a detail illustrating the tack pulling jaws in tack engaging position; Figs. 5, 6 and 7 are details illustrating various portions of the operating mechanism for the movable tack pulling jaw; Fig. 8 is a detail showing a plan view of the front portion of the tack receiving throat and spring plate attached thereto broken away from the machine; Fig. 9 is a view partially diagrammatic, illustrating the relation between the path of movement of the movable tack pulling jaw and the working face of the fixed jaw; Fig. 10 is a detail illustrating a portion of the left-hand side elevation of the tack driving mechanism, and showing a tack in dotted outline with the point deflected; Fig. 11 is a detail view illustrating a front elevation of the tack driving and tack pulling mechanisms, and showing the relative longitudinal positions and arrangement of the two; Fig. 12 is a detail showing a longitudinal section of the tack driving nozzle taken at right angles to the line of feed and illustrating the position of the tack after the tack driving plunger has reached the limit of its downward movement; Fig. 13 is a view partly in section showing the relative longitudinal positions of the tack driving nozzle and the tack pulling jaws; Fig. 14 is a plan view of the deflector block and tack deflector removed from the machine; and Fig. 15 is a view partially diagrammatic and illustrating the relation between the path of the movable tack pulling jaw and the deflected course which a tack follows when driven into the shoe.

The machine illustrated in the drawings comprises a tack pulling mechanism and a tack driving mechanism arranged adjacent to one another in the direction or line of feed of the shoe so that the side of a lasted shoe can be moved continuously along in one direction in order to remove the lasting tacks and insert the proper number of holding tacks. The tack driving plunger operates in a vertical plane extending in the direction of and passing through the line of feed, and the tack pulling mechanism has a

tack pulling movement in a plane inclined thereto. In order to properly position the lasting tacks and enable them to be readily operated upon by the tack pulling mechanism, the shoe is conveniently presented to the machine with the sole substantially normal to the plane of the tack pulling movement. As it is desirable that the holding tacks shall be inserted normal to the sole without varying the lateral inclination of the shoe, a suitable deflector is provided by means of which the tack is driven in a plane substantially parallel to the plane of the tack pulling movement. As is usual in this type of machines, the tack driving mechanism is constructed and arranged to drive only a single tack upon depressing the treadle, as it is only desired to insert the holding tacks at certain isolated points along each side of the shoe. The tack driving nozzle is arranged adjacent to the tack pulling mechanism and the side of the nozzle next to the tack pulling jaw forms a fixed abutment which may be utilized as a stop to position the tack accurately between the tack pulling jaw.

The machine as a whole is mounted upon a suitable frame 1, and is operated by a main drive shaft 2 journaled in the bearings 3 and 4 formed upon the upper portion of the machine frame. A well known type of tack driving mechanism is employed and is operated by a gear 5 mounted on the shaft 2. The mechanism is provided with a tack driving plunger 10 operating in the head 11 to deliver a single working blow when the operating treadle is depressed. As shown clearly in Figs. 2 and 11, the plunger is inclined to the line of feed of the shoe, which enables the holding tack to be driven in close proximity to the point at which the lasting tack is removed. The tacks are fed to the plunger down a throat 12 and the feeding mechanism is controlled in the usual manner in order that only a single tack shall be delivered at one time beneath the plunger. In order to deflect the course of the tack, the head 11 is provided with an enlarged bore at its lower end which is adapted to receive a cylindrical projection 14 formed upon a deflector block 15. The block is retained in position by a transverse pin 16 and is provided with a longitudinal bore formed therein through which the tack driving plunger passes so that the deflector block forms in effect a tack driving nozzle. In order to seat the tack deflector therein, the deflector block 15 is recessed vertically, as shown clearly in Figs. 12 and 13, and a deflector member 17 is pivotally supported in the recess. The deflector member 17, as shown clearly in Figs. 10 and 12, is formed as a quadrant and is pivotally mounted at its central point. The deflector is caused to project into the bore of

the block 15 by a spring 18 which is held between the upper face of the deflector and a cross pin 19 mounted in the block 15. The spring 18 bears upon the upper face of the deflector member, which swings around its pivotal point, as shown clearly in Fig. 10. The working face of the deflector projects obliquely into the bore of the deflector block and is dished or hollowed out as shown clearly in Fig. 11 to center the point of the tack accurately in the bore. When the tack drops into the bore under the tack driving plunger, the point is deflected, as shown in Fig. 10, and the point at which the tack penetrates the work and the consequent angle at which the tack is driven, are thus governed accurately. In order to limit the movement of the deflector member 17 in either direction, the face 20 of the block 15 is cut away, as shown clearly in Fig. 13, and the deflector member 17 is provided with a laterally projecting portion 21 forming the shoulders 22 and 23 which limit the movement of the deflector member in its outward and inward positions respectively. The tack driving plunger is not arranged to force the tack completely into the shoe, but leaves the tack projecting slightly above the surface and into the tack driving nozzle, as shown clearly in Fig. 12. The tack deflector is at all times supporting the tack and there is no chance for the tack to be bent or twisted out of the proper alinement under the pressure of the plunger. As stated previously, the tack driving nozzle and plunger are positioned adjacent to the tack pulling mechanism and the side face 24 of the nozzle is parallel to the tack pulling jaws and extends transversely of the line of feed. By locating the tack driving nozzle in this manner, it is possible to utilize the face 24 as an abutment against which the tack may be moved in order to accurately position the tack between the tack pulling jaws.

The tack pulling mechanism shown in the illustrated embodiment of the invention comprises a tack pulling jaw and a stationary jaw cooperating therewith, the tack pulling movement taking place in a linear direction substantially parallel to the work engaging surface of the stationary jaw. The movable tack pulling jaw first moves forward over the tack to be pulled, and then describes a loop in order to engage the tack and pull the tack upon the backward stroke of the tool. The desired movements are imparted to the jaw by a simple and efficient actuating mechanism consisting of a supporting arm for the jaw, a crank connected directly to one end of the arm, and a supporting link for the arm connected to the arm intermediate its ends. In the preferred form of the invention, the jaw is fixed in the lower end of a second arm pivoted centrally to the outer end of the supporting arm, and the upper free end of the second arm is connected to a fixed point by a suitable link connection. Thus upon a rotation of the driving crank, the supporting arm has imparted thereto a reciprocating and oscillating movement which is modified by the supporting link, and the jaw is oscillated relatively to the supporting arm by the second link connection. The compound movement thus imparted to the jaw serves to move the tack pulling jaw in an orbital path above the face of the stationary jaw, the tack pulling movement taking place upon the backward stroke of the jaw and in a direction substantially normal to the plane of the sole. The tack pulling jaw is formed as a claw having its tack engaging end directed toward the crank so that the tack may be readily pulled upon the back stroke without any tendency to displace the shoe or to bend the tack to one side and leave it driven into the shoe. In order to properly eject the tack, the working face of the stationary jaw terminates abruptly and a free space is formed beyond the end of the face so that the pressure upon the under side of the tack is suddenly relieved and it flies off into the tack receiving chute by virtue of the momentum which has been acquired. The movable tack pulling jaw is indicated at 25, and the fixed jaw at 26. The stationary jaw 26 is provided with a work engaging surface 27, over which the tack is drawn by the movement of the tack pulling jaw parallel thereto, as shown clearly in Fig. 9, and this surface serves as a thrust bearing against which the tack is pressed by the jaw 25. It is not intended that the tack pulling jaw 25 shall engage with the jaw 26, but the mechanism is so arranged that the distance between the point of the jaw 25 and the surface of the jaw 26 is substantially equal to the normal diameter of the shank of a tack. In order to accommodate for tacks of unusual size, however, the jaw 26 is yieldingly supported and moves downwardly when the pressure becomes too great. This relieves the strain upon the operating parts of the machine and prevents any undue breakage of the same. The jaw 26 is formed from a spring plate 28 which is conveniently fastened at one end to the frame of the machine by the bolts 29. The bottom of the tack receiving throat or passageway 30 is recessed in order to allow the spring plate to be seated therein, and the front portion of the plate is enlarged to form the work engaging surface 27. It will be noted that the work engaging surface extends above the interior surface of the throat or passageway 30 so that a vertical shoulder is formed at the junction of the jaw and fixed portion of the throat. This aids in controlling the

movement of the tack and insures that the tack will fly into the throat properly. The front edge of the throat and the jaw 26 are in alignment and the entire edge forms a convenient guide along which the tacks are moved into the path of the movable tack pulling jaw.

The proper movement is imparted to the tack pulling jaw by a supporting arm 31 upon the outer end of which the jaw is dependent. A reciprocating and oscillating movement is imparted to the supporting arm 31 by a suitable crank motion, and to this end, the supporting arm is connected at 32 to the crank shaft 33. The crank shaft 33 is journaled in a bracket 34 and is continuously rotated by a pulley 35. The pulley 35 is driven by a suitable belt 36 from a drive pulley 37 mounted upon the main drive shaft 2 of the machine. In order to control the course of the belt, an idler pulley 38 is journaled upon a shaft 39 which is mounted obliquely in the bracket 34. The tack pulling claw 25 is adjustably mounted in the lower end of an arm 40 which is pivotally connected at 41 to the outer end of the arm 31. The arm 31 is supported to reciprocate in a substantially horizontal plane by a link 42 which is pivotally connected to the arm at 43 and is journaled at its opposite end on a stud shaft 44, which is mounted in the bracket 34. The stud shaft is provided with a head formed upon one end and is retained in position by a collar 44^a clamped upon the opposite end thereof. The upper free end of the arm 40 is connected to the bracket 34 by a link 45, one end of which is pivotally connected at 46 to the arm, and the opposite end of which is pivotally connected at 47 to a projecting member 48 formed upon the bracket. Both a horizontal and a vertical adjustment of the jaw is obtained by clamping the jaw in a head 49, which is in turn clamped to the lower end of the arm 40. The head 49 is recessed upon its opposite faces to operatively engage with the jaw 25 and the arm 40. The jaw has provision for lateral or horizontal adjustment in the head 49 by a suitable bolt and slot connection 50, and the head 49 has provision for a vertical adjustment relatively to the arm 40 by a suitable bolt and slot connection 51.

It will be noted that the bracket 34 supports the entire operating mechanism for the tack pulling claw, and the entire mechanism may be readily removed by detaching the bracket from the machine proper. To this end, the bracket is provided with a supporting plate 52 which has an ample bearing surface and is fastened to the frame of the machine by a plurality of bolts 53. The moving parts of the tack pulling mechanism are suitably inclosed, and the operator

is protected from injury, by a curved guard 54 which is fastened to the bracket 34 by bolts 55. A downhold 56 is secured to the guard so as to be capable of vertical adjustment and the adjacent edges of the downhold and stationary jaw form a throat, the edges of which engage the lasting tacks and guide them into position to be engaged by the tack pulling jaw. The shoe is presented to the machine with the line of lasting tacks extending parallel to the tack engaging edge of the stationary jaw and the shoe upper is engaged by the stationary jaw and downhold upon opposite sides of the lasting tack so that the jaw and downhold constitute work supports for guiding the shoe and holding it in position during the operation of removing the lasting tacks.

While it is especially desired to use the above described tack pulling mechanism in connection with the present machine, it is to be understood that the construction and mode of operation of this tack pulling mechanism is capable of a general application and may be embodied in other types of machines without departing from the spirit of the invention.

While it is preferred to employ the specific construction and arrangement of parts shown and described, it will be understood that this construction and arrangement is not essential, except so far as specified in the claims, and may be changed or modified without departing from the broader features of the invention.

What is claimed is:—

1. A tack pulling and resetting machine having, in combination, a tack pulling tool, a tack driving plunger adjacent thereto, the tack pulling tool and the tack driving plunger having tack pulling and tack driving movements respectively lying in planes inclined to one another and extending in the direction of feed, and means cooperating with the plunger to deflect the course of the tack into a plane substantially parallel to the plane of the tack pulling movement.

2. A tack pulling and resetting machine having, in combination, a tack pulling tool having a tack pulling movement in an inclined plane of the line of feed, a tack driving plunger having a tack driving movement in the vertical plane of the line of feed, and means cooperating with the plunger to deflect the course of the tack into a plane substantially parallel to the plane of the tack pulling movement.

3. A tack pulling and resetting machine having, in combination, tack pulling mechanism and tack driving mechanism cooperating therewith including a tack driving nozzle arranged adjacent to the tack pulling mechanism and having one face extending

transversely of the line of feed to form a fixed abutment for positioning the tacks to be removed.

4. A tack pulling and resetting machine 5 having, in combination, a tack pulling tool and a tack driving plunger having tack pulling and tack driving movements respectively lying in planes inclined to one another and extending in the direction of feed, 10 a tack driving head, a deflector block supported upon the lower end of the head and provided with a bore in which the plunger operates and a deflector yieldably mounted in the head and arranged with one face projecting obliquely into the bore whereby the 15 tack is deflected in the bore into a plane substantially parallel to the plane of the tack pulling movement.

5. A tack pulling and resetting machine 20 having, in combination, a tack pulling tool and a tack driving plunger having tack pulling and tack driving movements respectively lying in planes inclined to one another and extending in the direction of feed, 25 a tack driving head, a deflector block supported upon the lower end of the head and provided with a bore in which the plunger operates, and a deflector yieldably mounted in the head and arranged with one face projecting obliquely into the bore, the face being 30 dished out, whereby the point of the tack is positioned accurately in the bore.

6. A tack pulling and resetting machine comprising a jaw supporting arm, a crank 35 directly connected to one end of the arm, an oscillatory supporting link pivotally connected to the arm intermediate its ends, a tack pulling jaw depending from the free end of the arm and having its tack engaging end directed toward the crank, and 40 means for rotating the crank in a direction to cause the jaw to move forward over a tack and pull the tack on its backward stroke.

7. A tack pulling and resetting machine 45 comprising a jaw supporting arm, a crank directly connected to one end of the arm, an oscillatory supporting link pivotally connected to the arm intermediate its ends, a tack pulling jaw depending from the free 50 end of the arm and having its tack engaging end directed toward the crank, a cooperating stationary jaw, and means for rotating the crank in a direction to cause the tack pulling jaw to move forward over a tack and 55 pull the tack on its backward stroke substantially parallel to the face of the stationary jaw.

8. A tack pulling and resetting machine 60 comprising a jaw supporting arm, a crank directly connected to one end of the arm, an oscillatory supporting link pivotally connected to the arm intermediate its ends, a second arm pivotally supported upon the outer end of the first mentioned arm, a link

connection between the upper free end of 65 the second arm and a fixed point, a tack pulling jaw rigidly mounted upon the lower end of the second arm and having its tack engaging end directed toward the crank, and 70 means for rotating the crank in a direction to cause the jaw to move forward over a tack and pull the tack on its backward stroke.

9. A tack pulling and resetting machine comprising a jaw supporting arm, a crank 75 directly connected to one end of the arm, an oscillatory supporting link pivotally connected to the arm intermediate its ends, a second arm pivotally supported upon the outer end of the first mentioned arm, a link 80 connection between the upper free end of the second arm and a fixed point, a tack pulling jaw rigidly mounted upon the lower end of the second arm and having its tack engaging end directed toward the crank, a 85 cooperating stationary jaw, and means for rotating the crank in a direction to cause the tack pulling jaw to move forward over a tack and pull the tack on its backward stroke substantially parallel to the face of 90 the stationary jaw.

10. A tack pulling and resetting machine comprising a movable tack pulling jaw arranged to grasp and pull the tack upon the 95 back stroke, a tack receiving throat and a stationary jaw yieldably supported adjacent to and below the entrance of the throat and provided with a work engaging surface extending substantially parallel to the direction 100 of the tack pulling movement.

11. A tack pulling and resetting machine comprising a movable tack pulling jaw arranged to grasp and pull the tack upon the 105 back stroke, a tack receiving throat and a stationary jaw yieldably supported adjacent to the entrance of the throat, the front edges of the jaw and throat being in alinement and extending substantially parallel with the line of lasting tacks whereby a guide is formed 110 for the tacks in order to position them accurately for the tack pulling jaw.

12. A tack pulling and resetting machine comprising a movable tack pulling jaw arranged to grasp and pull the tack upon the 115 back stroke, a tack receiving throat and a stationary jaw yieldably supported on the throat and adjacent to the entrance of the throat and provided with a work engaging surface extending substantially parallel to the direction of the tack pulling movement, 120 the work engaging surface terminating abruptly and forming a free space above the jaw in order to release and eject the tack into the tack receiving throat.

13. A tack pulling and resetting machine 125 comprising a movable tack pulling jaw arranged to grasp and pull the tack on its backward stroke, a tack receiving throat, a

spring plate fastened to the under side of the throat and having its front portion enlarged to form a work engaging surface extending substantially parallel to the direction of the tack pulling movement.

5 14. A tack pulling and resetting machine comprising a movable tack pulling jaw, operative connections for imparting the proper movements to the jaw, a casing in-

closing the tack pulling jaw and operative 10 connections therefor, and a bracket upon which the casing and movable operating parts are mounted detachably supported upon the frame of the machine.

JOHN B. HADAWAY.

Witnesses:

CHESTER E. ROGERS,
LAURA M. GOODRIDGE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."