E. ERICKSON.

FASTENING INSERTING MACHINE.

APPLICATION FILED FEB. 10, 1919.

1,360,384.

Patented Nov. 30, 1920.

4 SHEETS—SHEET 1.

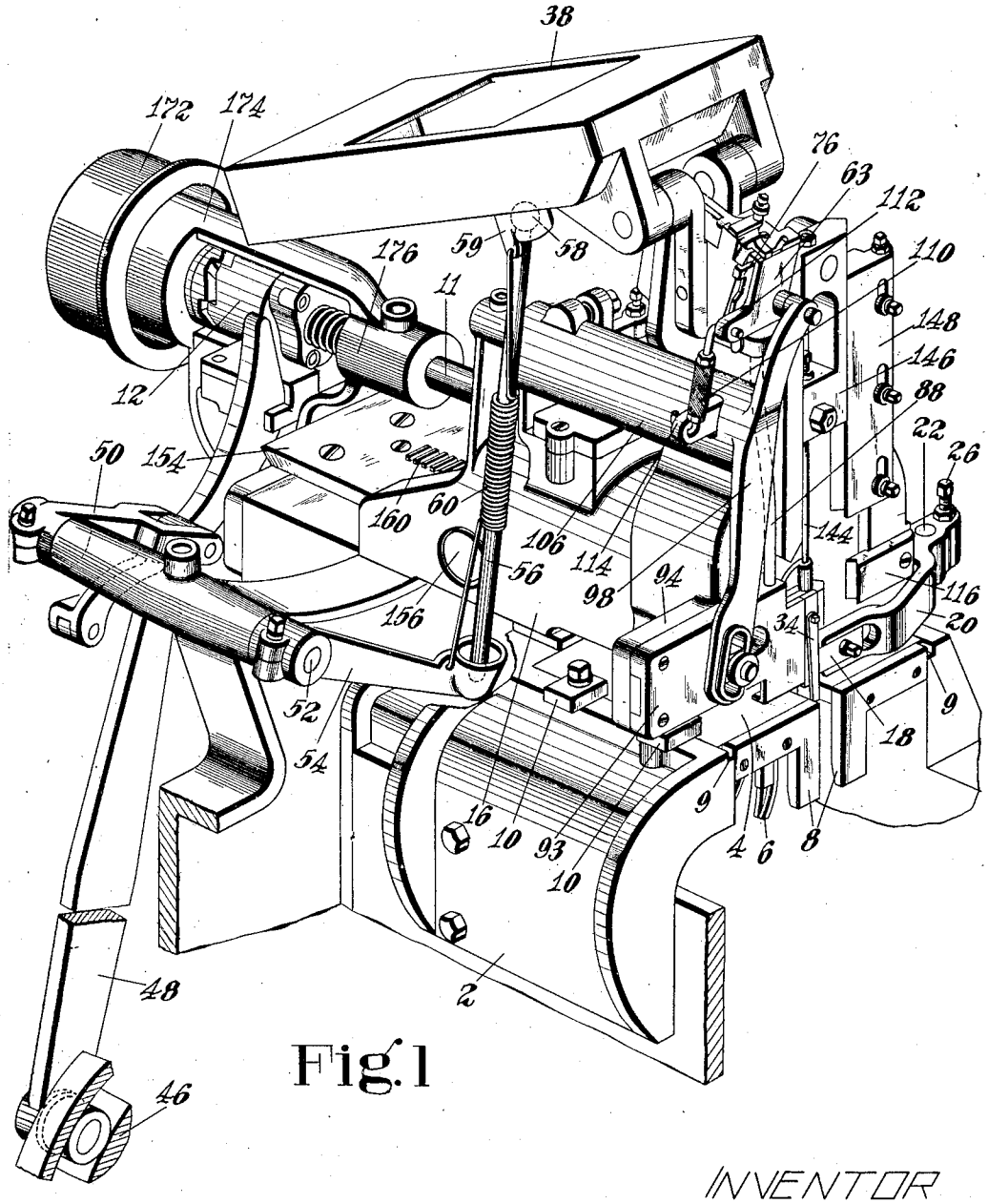


Fig. 1

INVENTOR

Edward Erickson

By his Attorney

Nelson N. Howard

E. ERICKSON.

FASTENING INSERTING MACHINE.

APPLICATION FILED FEB. 10, 1919.

1,360,384. Patented Nov. 30, 1920.

4 SHEETS—SHEET 2.

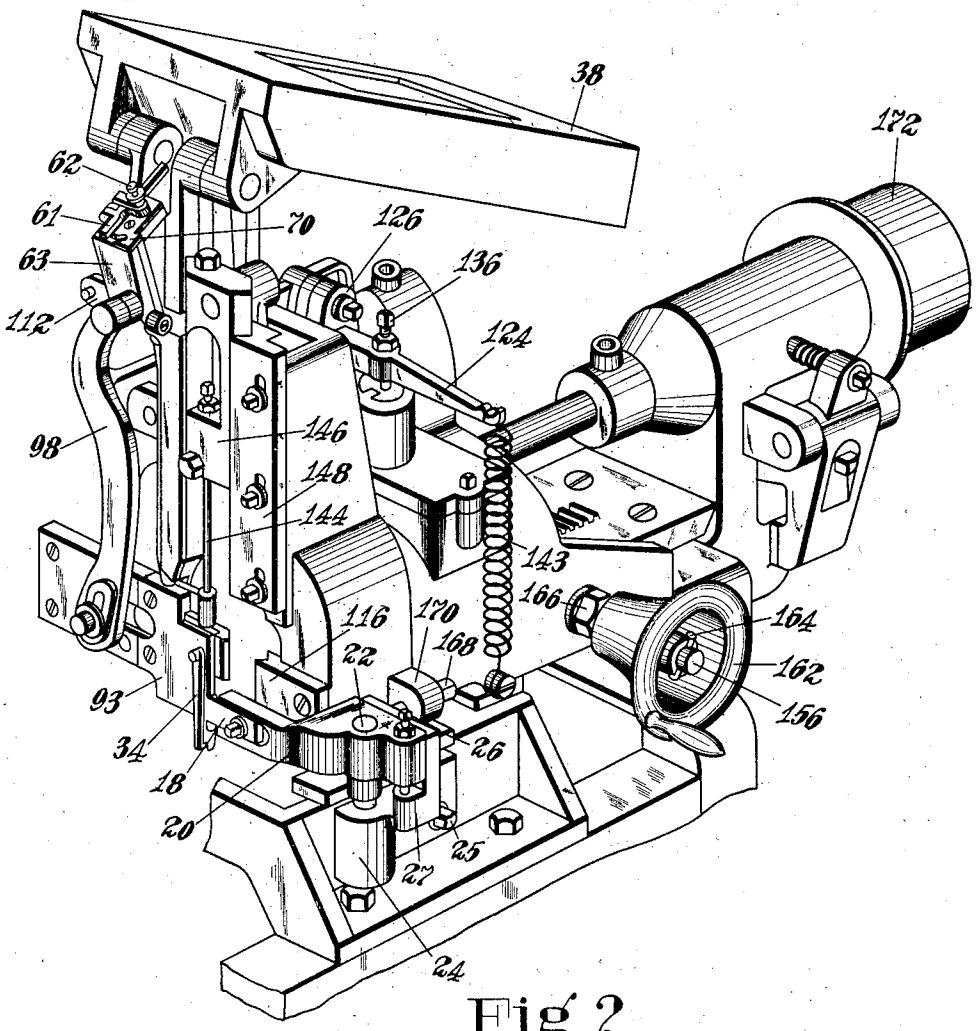


Fig. 2

INVENTOR

Edward Erickson

By his Attorney

Nelson B. Hubbard

E. ERICKSON.

FASTENING INSERTING MACHINE.

APPLICATION FILED FEB. 10, 1919.

1,360,384.

Patented Nov. 30, 1920.

4 SHEETS—SHEET 3.

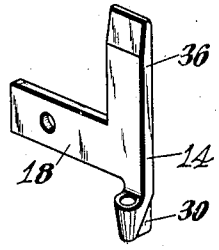


Fig. 4

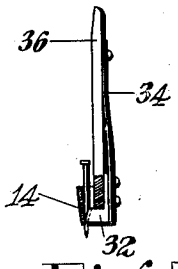


Fig. 5

Fig. 3

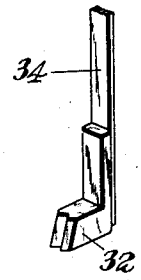


Fig. 6

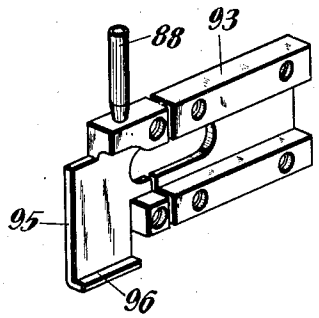


Fig. 7

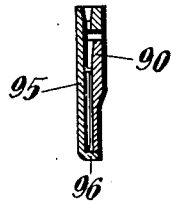


Fig. 8

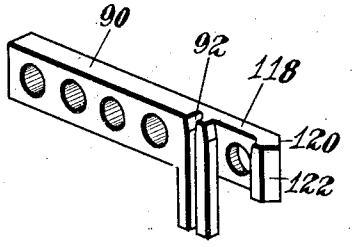


Fig. 9

INVENTOR

Edward Erickson

By his Attorney,

Nelson N. Howard

E. ERICKSON.

FASTENING INSERTING MACHINE.

APPLICATION FILED FEB. 10, 1919.

1,360,384.

Patented Nov. 30, 1920.

4 SHEETS—SHEET 4.

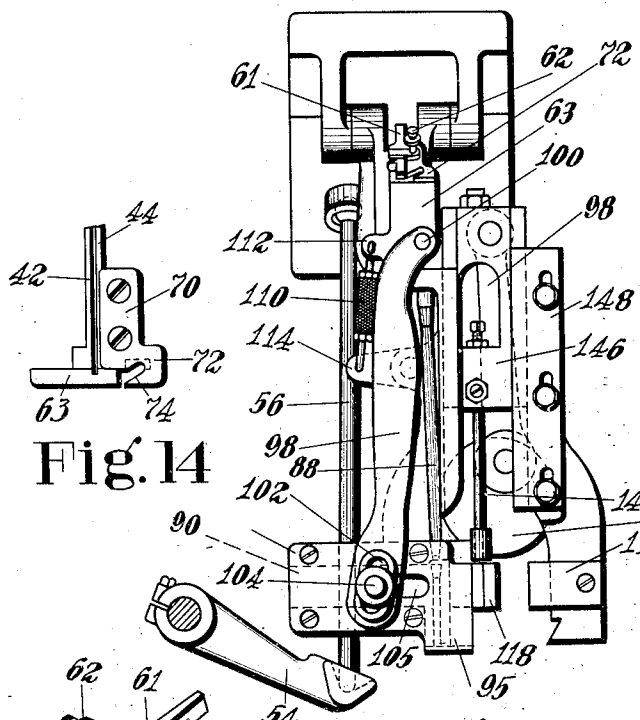


Fig. 10

Fig. 14

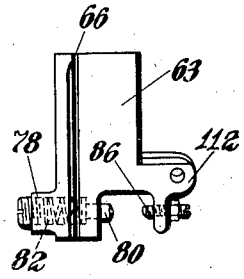


Fig. 15

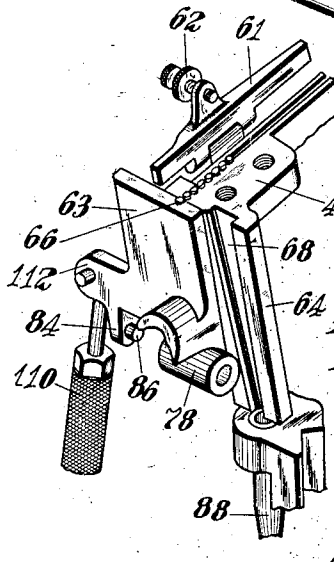


Fig. 12

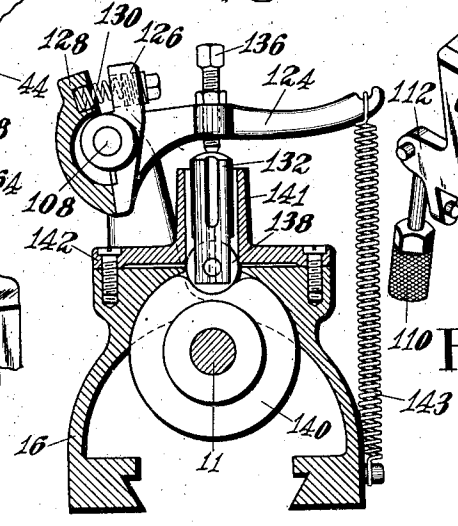


Fig. 11

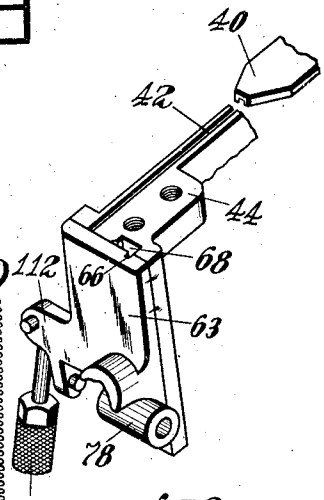


Fig. 13

INVENTOR

Edward Erickson

By his Attorney,

Nelson M. Howard

UNITED STATES PATENT OFFICE.

EDWARD ERICKSON, OF BEVERLY, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

FASTENING-INSERTING MACHINE.

1,360,384. Specification of Letters Patent. Patented Nov. 30, 1920.

Application filed February 10, 1919. Serial No. 276,087.

To all whom it may concern:

Be it known that I, EDWARD ERICKSON, a citizen of the United States, and resident of Beverly, in the county of Essex and State of Massachusetts, have invented certain Improvements in Fastening-Inserting Machines, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to fastening inserting machines and aims to produce a machine for inserting fastenings which will be simple in construction and efficient and reliable in operation.

The invention will be described, by way of example, as embodied in a machine for building heels, in the operation of which a heel composed of a plurality of lifts assembled by the machine is introduced into a form comprising members depending therefrom for engagement with the edges of the lifts to effect such relative movements of them as may be necessary properly to constitute the heel. A fastening or fastenings are then inserted into the heel to secure the lifts together. The heels sometimes become jammed in the form, or fail otherwise to be accurately located in it. Consequently, the form is preferably removably mounted on the frame of the machine so that the operator may readily ascertain the cause of the difficulty and effect its cure. The form operates to position the heel, which is moved upwardly thereagainst, relatively to the fastening inserting mechanism, and an object of the invention is to associate the fastening inserting mechanism with the frame of the machine and the work-positioning means in such wise as to facilitate the inspection of the work in the positioning means and the removal of the positioning means from the machine.

To this end an important feature of the invention resides in the combination with work positioning means constructed to position a piece of work disposed below said means, of fastening inserting mechanism comprising means for driving fastenings and means for delivering fastenings thereto and movable to expose the work positioning means to permit ready inspection of the work or the removal of the work positioning means when desired. In the illustrated construction, the throat through which the fastenings are inserted is mounted on the machine frame separate from the mechanism for delivering the fastenings to the throat and driving them into the work, but may itself be readily detached from the machine frame to allow the withdrawal of the work positioning means therefrom.

Other important features of the invention pertain to means for delivering fastenings successively to the throat, means for supplying fastenings to the delivering means, and novel operating means for the supplying means and the delivering means.

Although the invention will be hereinafter described in its application to a machine for building heels, it is recognized that the invention as a whole and certain features thereof are capable of use in other relations including embodiment in an independent machine for inserting fastenings. Accordingly, the scope of the invention is intended to be limited only as required by the claims.

Still other objects and features of the invention will appear as the description proceeds and will be pointed out in the appended claims.

In the drawings,—

Figure 1 is a perspective view in elevation of a machine embodying the invention;

Fig. 2 is an elevational view taken from the opposite side of the machine to that shown in Fig. 1;

Fig. 3 is a cross-sectional elevation of the support for the fastening inserting instrumentalities of the machine;

Fig. 4 is a detail view in perspective of the throat through which the fastenings are driven;

Fig. 5 shows the same in cross-section;

Fig. 6 is a view in detail of the device for maintaining the fastening upright in the passage of the throat while it is being driven;

Fig. 7 exhibits the guiding plate for the carrier which delivers the fastenings successively to the throat;

Fig. 8 is a cross-section through the plate and carrier;

Fig. 9 is a detail view of the carrier;

Fig. 10 is a view in front elevation of the fastening inserting mechanism of the machine;

Fig. 11 is a cross-section showing the operating means for certain features of the fastening inserting mechanism;

Fig. 12 shows the means for supplying fastenings singly to the carrier with the transferrer in fastening receiving position;

Fig. 13 is a view of the same with the transferrer in position to discharge the fastening;

Fig. 14 is a plan view showing the means for insuring the positive discharge of the fastening from the carrier, and

Fig. 15 shows the transferrer looking from its inner side.

Mounted on the frame 2 of the heel building machine is a form 4 comprising a plate from which depend members 6 and 8 designed for engagement with the contour and breast edges of a heel respectively. The heels may be jammed in the form 4 or for other reasons may fail to enter or be discharged from the form in a proper manner. Consequently, it is desirable that the operator have ready access to the form in order that he may conveniently obviate any difficulty which may be experienced in its operation. To this end, the form is removably mounted on the machine frame 2. This may be effected in any suitable manner, but as shown, the form is seated in recesses 9 formed in the sides of the frame 2 and is retained in said recesses by blocks 10 secured to the frame 2 by screws or the like passing through slots in the blocks. When the screws are tightened, the under surfaces of the blocks are pressed downwardly upon the form 4 so as to clamp the form against the bottoms of the recesses 9. When the screws are loosened, however, the blocks may be pushed back so as to permit the form 4 to be lifted away from the frame 2.

The illustrated machine is designed to insert a single fastening, hereinafter for convenience of description sometimes termed a "nail", in each heel for which reason the shaft 11 which operates the inserting mechanism is provided with a one-revolution clutch indicated generally by the reference numeral 12 in Fig. 1. The clutch mechanism may be of any usual or suitable construction and constitutes in itself no part of the present invention, wherefore a more complete description of the same is deemed unnecessary.

A throat 14 is adjustably carried by the frame 2 of the machine above the form 4, and the nail inserting mechanism of the machine comprises means for delivering nails successively to the throat and for driving them into the work. As shown, the nail delivering and driving means is carried by a slidable support 16 movable on the frame 2 independently of the throat 14. The throat 14 has a lateral extension 18 bolted or otherwise suitably secured to an arm 20 provided with an opening adapted to fit over a pin 22 extending upwardly from a bracket 24 having a pin and slot connection 25 with the frame 2 of the machine. The throat 14 may be adjusted vertically by a set screw 26 threaded into the arm 20 adjacent to said opening and abutting against a shoulder 27 on the bracket 24. It is apparent from the foregoing that the throat 14 may be removed from the frame 2 by lifting the arm 20 from the pin 22. The throat 14 is cut away, as indicated at 30, Fig. 4, to receive a block 32 supported by a leaf spring 34 from the upwardly extending portion 36 of the throat and serving to maintain the nail in upright position while it is being driven into the work.

The nails which are to be inserted into the work are introduced into a hopper or container 38 having a slot formed in its bottom over which is superposed a plate 40, Fig. 13, which in turn is alined with the slot 42 of a raceway 44 on the sliding support 16. The container 38 is oscillated so as to agitate the nails contained therein and cause them to range themselves in the slot of the container by connections with a cam 46 comprising a link 48 joined to an arm 50 carried by a rock shaft 52 journaled in the frame 2 of the machine and having mounted thereon an arm 54 having a cup-shaped end in which is received one end of a rod 56 formed at its other end with a ball 58 socketed in a member 59 extending downwardly from the container 38. A spring 60 coiled about the rod 56 and connected at its ends to the member 59 and the arm 54, respectively, serves to maintain the rod 56 in the cup of the arm 54.

A cover plate 61 is pivoted to the raceway 44 at one side of the slot 42 so as to be capable of being swung upwardly from the slot of the raceway to expose the slot and the nails contained therein, and a set screw 62 carried by the cover plate 61 engages the upper surface of the raceway and may be turned to adjust the cover plate vertically relatively to the raceway.

In accordance with the invention, means is provided for supplying nails singly from the raceway 42 to the means for delivering the nails successively to the throat 14. Preferably, and in the illustrated construction, said means comprises a transferrer 63 movable across the front of a downwardly extending portion 64 of the raceway 44. The transferrer 63 has its upper surface substantially level with the upper surface of the raceway 44 and has formed therein a groove 66 substantially equal in size to the shanks of the nails contained in the raceway. Accordingly, when the groove 66 of the transferrer is alined with the slot 42 of the raceway, the endmost nail in the slot slides down into the groove with its head lying on the upper surface of the transferrer. The transferrer 63 is movable from a position with

its groove 66 in alinement with the slot 42 of the raceway 44 to a position in alinement with a channel 68 formed in the downwardly extending portion 64 of the raceway 44. A member 70 secured to the raceway 44 by screws or the like has a portion 72 adapted to overlie the upper surface of the transferrer and formed with a slot presenting a cam surface 74 for engagement with the head of the nail carried by the transferrer to discharge the nail positively from the transferrer into the channel 68.

In order to insure the proper delivery of the endmost nail in the raceway into the groove 66 of the transferrer 63, I provide a separator 76 movable in a recess formed in the front surface of the portion 64 of the raceway and interposed upon movement of the transferrer in a direction to aline the groove 66 with the raceway slot 42 between the endmost nail in the raceway and the remaining nails to dispose the endmost nail properly in said groove. Preferably and in the illustrated construction, the separator 76 is operated by connections with the transferrer 63. As shown, the transferrer is formed at one side of its lower portion with a boss 78 in which is received a plunger 80 normally urged by a spring 82 in the direction of the separator and depending from the other side of the transferrer is a lug 84 in which is a pin 86, the construction being such that upon movement of the transferrer 63 to the left, Fig. 2, the plunger 80 is carried into engagement with the separator and moves the separator to a position intermediate between the endmost fastening and the remaining fastenings. The continued movement of the transferrer 63 after the separator 76 has completed such movement, causes the plunger 80 to yield against the resistance of the spring 82. When the transferrer 63 is moved in the opposite direction to convey the nail in the groove 66 to the channel 68, the pin 86 engages the separator 76 and withdraws it from the path of the nails thereby permitting them to slide downwardly in the slot of the raceway against the transferrer.

The nails pass from the channel 68 into a tube 88 by which they are conducted to the devices which deliver them into the passage of the throat 14. Such devices in turn comprise a carrier 90 formed with a recess 92 movable from a nail receiving position in alinement with the tube 88 to a position in alinement with the passage of the throat 14 to deliver the nail into the passage of the throat. The carrier 90 is guided in its movements by a plate 93 secured by screws or other appropriate means to a projection 94 on the support 16 and having a portion 95 provided with an inwardly extending shelf 96 which supports the nail in the recess 92 of the carrier 90. The shelf 96 extends from the nail receiving position of the recess 92 to the throat 14 so as effectually to sustain the nail from the time of its introduction into the recess 92 until it is delivered into the passage of the throat.

The transferrer 63 and carrier 90 are driven by common operating means which, as shown, comprises a lever 98 fulcrumed at 100 to the transferrer 63 and having a slot 102 which receives a pin 104 extending laterally from the carrier 90 and movable in a slot 105 of the guiding plate 93. The operating lever 98 is connected intermediate its connections with the transferrer 63 and the carrier 90 to a shaft 106 sleeved on a rod 108 carried by the sliding support 16.

The transferrer 63 is caused to have a parallel motion or, in other words, is caused to remain in substantially vertical position during its movement by a link 110 connected to a projecting portion 112 of the transferrer 63 and to a lug 114 projecting outwardly from the support 16.

It is essential that the passage 92 of the carrier 90 be accurately alined with the passage of the throat 14. To this end an abutment 116 is provided on the frame 16 for engagement with the forward extension 118 of the carrier 90, the abutment 116 being so positioned as to discontinue the endwise movement of the carrier at the proper time. In order further to aline the passage 92 of the carrier 90 accurately with the passage of the throat in a direction laterally of the movement of the carrier 90, the extension 118 of the carrier is formed with oppositely inclined surfaces 120 and 122 adapted to engage correspondingly disposed surfaces of the abutment 116. The operating means for the lever 98 is so constructed as to yield upon engagement of the carrier 90 with the abutment 116. As shown, such means comprises a lever 124 having an upstanding portion 126 between which and an upstanding boss on the sleeved shaft 106 is interposed a spring 130. The spring 130 is stiff enough to transmit the movement of the lever 124 positively to the carrier 90 until the carrier engages the abutment 116, after which the continued movement of the lever 124 merely compresses the spring. The lever 124 is moved in a direction to shift the carrier from nail receiving to nail delivering position by a plunger 132 acting against a set screw or the like 136 carried by the arm 124 and having a roll 138 riding on the periphery of a cam 140 on the shaft 10. As shown, the plunger is slidably mounted in a guideway 141 formed integrally with a plate 142 secured to the slide 16. The carrier is returned to nail receiving position by a spring 143 connected at one end to the lever 124 and at its other end to the slide 16.

The nails, after being delivered to the throat, are driven into the work by a driver 144 carried by a driver bar 146 slidably

mounted in guides 148 mounted on the support 16. As shown, the driver bar 146 is operated by a link 150 connected in turn to a crank 152 on the shaft 11.

The support 16 is dovetailed on an upstanding portion 154 of the frame 2 and has journaled therein a shaft 156 on which is a pinion 158 meshing with rack teeth 160 on the frame 2. The shaft 156 is designed to be rotated manually to move the support 16 in the desired direction, and, to this end, it is provided with a hand wheel 162. As shown, the hand wheel 162 is loose on the shaft 156, and the hub of the wheel is formed with recesses adapted to receive the ends of a pin 164 projecting from diametrically opposite sides of the shaft. Means are preferably provided for securing the support 16 in position on the frame 2. In the illustrated construction, such means comprises a nut 166 threaded on the shaft 156 and movable by rotation on the shaft into clamping relation with the adjacent wall of the support 16. The inner end of the hand wheel 162 is formed to engage the nut 166. Accordingly, the hand wheel 162 may be manipulated either to move the support 16 on the frame 2 or to secure it in adjusted position on said frame, the hand wheel being drawn outwardly on the shaft 156 into engagement with the pin 164 when it is desired to move the support 16 and being thrust inwardly to engage the nut 166 to lock the support to the frame. In order to limit the forward movement of the support 16 to a point such that the passage 92 of the carrier 90 will be accurately alined with the passage of the throat 14, a set screw 168 is threaded into a lug 170 projecting laterally from the support. The set screw 168 acts against the bracket 24 upon which the throat 14 is mounted. The shaft 11 partakes of the movements of the support 16 and is keyed to its driving pulley 172 which is withheld from endwise movement with the shaft by connections 174 with the bearing 176 of the shaft.

It is frequently desirable to inspect the form 4 or the work contained therein. In such case, the slide 16 may be readily moved rearwardly to expose the form. If it is then found to be advisable to remove the form from the frame 2, it is necessary only to lift the arm 20 from the pin 22, and to loosen the blocks 10 by which the form is secured to the frame 2.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a machine of the class described, a member having a fastening receiving passage, a carrier plate for conveying fastenings successively to said passage, means for supplying fastenings singly to the carrier plate, and common operating means for the carrier plate and the supplying means interposed between and connecting the plate and said means.

2. In a machine of the class described, a member having a fastening receiving passage, a carrier formed with a passage to receive a fastening and movable from fastening receiving position to a position in alinement with the passage of the member, means for supplying fastenings to the carrier, and common operating means for the carrier and the supplying means interposed between the carrier and the supplying means.

3. In a machine of the class described, the combination with a member having a fastening receiving passage, of a carrier for delivering fastenings successively into said passage, a raceway constructed to support fastenings in upright position, means superposed above the carrier and substantially in the vertical plane of the carrier for supplying fastenings singly from the raceway to the carrier, and common operating means for the supplying means and the carrier.

4. In a machine of the class described, the combination with a member having a fastening receiving passage, of a carrier for delivering fastenings successively into said passage, a raceway constructed to support fastenings in upright position, means for conveying fastenings singly from the raceway to the carrier comprising a transferrer mounted for movement independently of the carrier and formed with a groove to receive a single fastening from the raceway, and means for operating the carrier and the transferrer.

5. In a machine of the class described, the combination with a member having a fastening receiving passage, of a carrier for delivering fastenings successively into said passage, a raceway, a transferrer constructed to receive fastenings singly from the raceway, means for conducting the fastenings from the transferrer to the carrier, and common operating means connecting the transferrer and carrier.

6. In a machine of the class described, the combination with a member having a fastening receiving passage, of a carrier for delivering fastenings successively to said member, a source of fastening supply, means movable relatively to the carrier for supplying fastenings singly from said source of fastening supply to the carrier, and a common operating lever for the supplying means and the carrier.

7. In a machine of the class described, the combination with a member having a fastening receiving passage, of a carrier for delivering fastenings successively to said passage, a raceway, means for supplying fastenings from the raceway to the carrier comprising a transferrer having a groove formed to receive a single fastening from the raceway,

and an operating lever connected at one side of its fulcrum point to the transferring means and at the other side to the carrier.

8. In a machine of the class described, the combination with a member having a fastening receiving passage, of a carrier movable from a fastening receiving position to a position in alinement with said passage, a raceway disposed in a plane substantially transverse to the direction of movement of the carrier, means for supplying fastenings singly from the raceway to the carrier comprising a transferrer above the carrier and movable independently of the carrier in a vertical plane substantially parallel to the plane of movement of the carrier, and means for operating the transferrer and carrier.

9. In a machine of the class described, the combination with a throat, of a member adjacent to said throat formed with a shelf constructed to support a fastening by engagement with its entering end, means for conveying the fastening along the shelf to the throat with its entering end riding on the shelf, a raceway, and means for supplying fastenings singly from the raceway to the conveying means.

10. In a machine of the class described, the combination with a throat, of a member adjacent to said throat formed with a shelf constructed to support a fastening, means for conveying the fastening along the shelf to the throat, a raceway, and means for supplying fastenings from the faceway to the conveying means comprising a tube leading downwardly to the conveying means and a transferrer for carrying the fastenings singly from the raceway to said tube.

11. In a machine of the class described, the combination with a throat, of means for delivering fastenings to the throat and means for supplying fastenings to the delivering means comprising a transferrer constructed to support a fastening by its head and means mounted independently of the transferrer so as to overlie the transferrer and constructed to engage the head of the fastening to remove it from the transferrer.

12. In a machine of the class described, the combination with a throat, of means for delivering fastenings to the throat and means for supplying fastenings to the delivering means, comprising a tube, a transferrer having a groove formed to receive a single fastening supported by its head in the transferrer, means for moving said transferrer to carry said groove from nail receiving position to a position in alinement with said tube, and a stationary cam member overlying the transferrer and disposed to engage the head of the fastening upon movement of the carrier from nail receiving position to remove the fastening from said groove and cause it to fall into said tube.

13. In a machine of the class described, fastening inserting mechanism and means for supplying fastenings successively to the fastening inserting mechanism comprising a raceway, a reciprocating transferrer extending across the end of the raceway and having a groove formed to receive fastenings singly from the raceway, said transferrer being operable to support a fastening by engagement with its head, a separator movable relatively to the transferrer for isolating the fastening in the groove of the transferrer from the remaining fastenings in the raceway, and a stationary member overlying the transferrer and operating to remove the fastening from the transferrer.

14. In a machine of the class described, the combination with fastening inserting mechanism, of a raceway, a transferrer constructed to receive fastenings singly from the raceway and operable to support a fastening by engagement with its head, a separator operated by the transferrer for isolating the fastening in the transferrer from the remaining fastenings in the raceway, and a stationary member overlying the transferrer and formed to present a cam surface disposed for engagement with the head of the fastening to remove it from the transferrer.

15. In a machine of the class described, the combination with fastening inserting mechanism, of means for supplying fastenings successively to the inserting mechanism comprising a raceway, a transferrer plate disposed transversely of the raceway and having a groove formed to receive a single fastening from the raceway, a separator for isolating the endmost fastening in the raceway from the remaining fastenings and moving it into the groove of the transferrer, and means carried by the transferrer for operating the separator yieldingly in a direction to engage the endmost fastening in the raceway.

16. In a machine of the class described, the combination with fastening inserting mechanism, of means for supplying fastenings successively to the inserting mechanism comprising a raceway, a transferrer plate disposed transversely of the raceway and having a groove formed to receive a single fastening from the raceway, a separator for isolating the fastening in the transferrer from the remaining fastenings in the raceway, and spaced members carried by the transferrer for moving the separator in opposite directions.

17. In a machine of the class described, the combination with fastening inserting mechanism, of means for supplying fastenings successively to the inserting mechanism comprising a raceway, a transferrer plate disposed transversely of the raceway and having a groove formed to receive a single fastening from the raceway, a separator for

isolating the fastening in the transferrer from the remaining fastenings in the raceway, and spaced members carried by the transferrer for moving the separator in opposite directions, one of said members being operable to move the separator in a direction to isolate the fastening in the transferrer from the remaining fastenings and being yieldably mounted relatively to the transferrer.

18. In a machine of the class described, the combination with fastening inserting mechanism, of a raceway, a transferrer having a groove formed to receive fastenings singly from the raceway, a lever pivoted to the transferrer for moving the transferrer, means for operating the lever, and independent means connected to the transferrer for maintaining the transferrer in upright position during its movements.

19. In a machine of the class described, the combination with a throat having a fastening receiving passage, means for delivering fastenings successively to the throat, means for yieldingly operating the delivering means, and means separate from the operating means for positioning the delivering means relatively to the throat.

20. In a machine of the class described, the combination with a throat having a passage to receive fastenings, of a carrier formed with a passage to receive a single fastening for delivery into the passage of the throat, an abutment for positioning the carrier with its passage in alinement with the throat, and operating means for the carrier constructed to yield upon engagement of the carrier with the abutment.

21. In a machine of the class described, the combination with a throat having a passage to receive a fastening, a carrier for delivering fastenings successively into the passage of the throat, means for operating the carrier, and an abutment for positioning the carrier both laterally and longitudinally relatively to the passage in the throat.

22. In a machine of the class described, the combination with a throat having a passage to receive a fastening, of a carrier for delivering fastenings successively into the passage of the throat, yielding means for operating the carrier, and an abutment constructed to discontinue the movement of the carrier to position it relatively to the passage of the throat in the direction of movement of the carrier and being further constructed to position the carrier relatively to the passage of the throat in a direction laterally of the movement of the carrier.

23. In a machine of the class described, the combination with work positioning means constructed to position a piece of work disposed below said positioning means, fastening inserting mechanism disposed above the work positioning means and comprising means for driving fastenings and means for delivering fastenings thereto, and means for moving the fastening inserting mechanism into and out of operative relation to the work positioning means.

24. In a machine of the class described, the combination with a frame, of work positioning means adapted to be moved upwardly from said frame, a throat above the work positioning means, means for mounting the throat on the frame of the machine constructed to enable ready removal of the throat from the machine, fastening inserting mechanism comprising means for driving fastenings and means for delivering fastenings thereto, and means for moving the fastening inserting mechanism into and out of operative relation to said throat.

25. In a machine of the class described, the combination with a throat having a passage to receive a fastening, of a support movable relatively to the throat, and means carried by the support for delivering a fastening into the throat and inserting it into the work.

26. In a machine of the class described, the combination with work positioning means, of a throat adjustable relatively to the work positioning means, a support movable relatively to the throat, and means carried by the support for delivering a fastening into the passage of the throat and inserting it into the work.

27. In a machine of the class described, a frame, work positioning means removably mounted on said frame and comprising depending members adapted to have the work thrust upwardly between them, fastening inserting mechanism comprising means for driving fastenings, and means for delivering fastenings thereto, and means for moving the fastening inserting mechanism out of operative relation to the work positioning means to facilitate the removal of the work positioning means.

28. In a machine of the class described, the combination with work positioning means, of a throat adjustable relatively to the work positioning means, a frame movable relatively to the throat, a carrier movably mounted on said frame for delivering fastenings successively into the passage of the throat, means for inserting the fastenings into the work, and means for operating the carrier and inserting means.

29. In a machine of the class described, a frame, work positioning means detachably connected to the frame and arranged to be removed from the frame by upward movement, fastening inserting mechanism normally disposed over the work positioning means and comprising means for driving fastenings and means for delivering fastenings thereto, and means for moving the fastening inserting mechanism out of

operative relation to the work positioning means to facilitate the removal of the work positioning means.

30. In a machine of the class described, a frame, work positioning means detachably connected to the frame and arranged to be removed from the frame by upward movement, fastening inserting mechanism including means for driving fastenings and means for delivering fastenings to the driving means, said delivering means comprising a source of fastening supply and a raceway for conducting fastenings therefrom, and means for moving the fastening inserting mechanism into and out of operative relation to the work positioning means.

31. In a machine of the class described, the combination with a throat having a passage to receive a fastening, of a support movable relatively to the throat, fastening driving means carried by the support and means carried by the support for presenting fastenings to the driving means, said presenting means comprising a source of fastening supply and means including a raceway for conducting fastenings from the source of fastening supply to the driving means.

In testimony whereof I have signed my name to this specification.

EDWARD ERICKSON.