

J. M. WIGGIN.
 WORK SUPPORT.
 APPLICATION FILED JULY 17, 1909.

1,014,353.

Patented Jan. 9, 1912.
 2 SHEETS—SHEET 1.

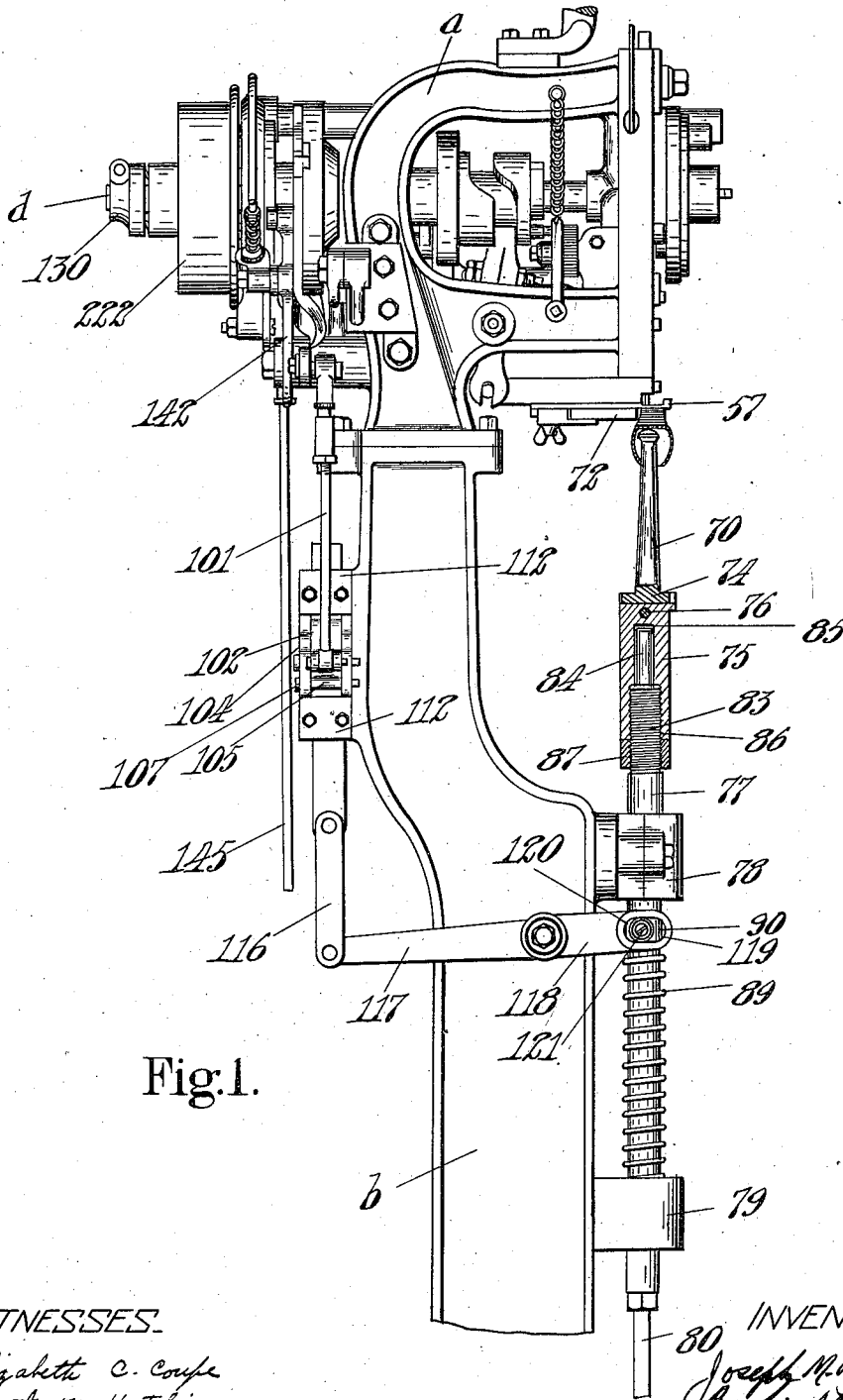


Fig. 1.

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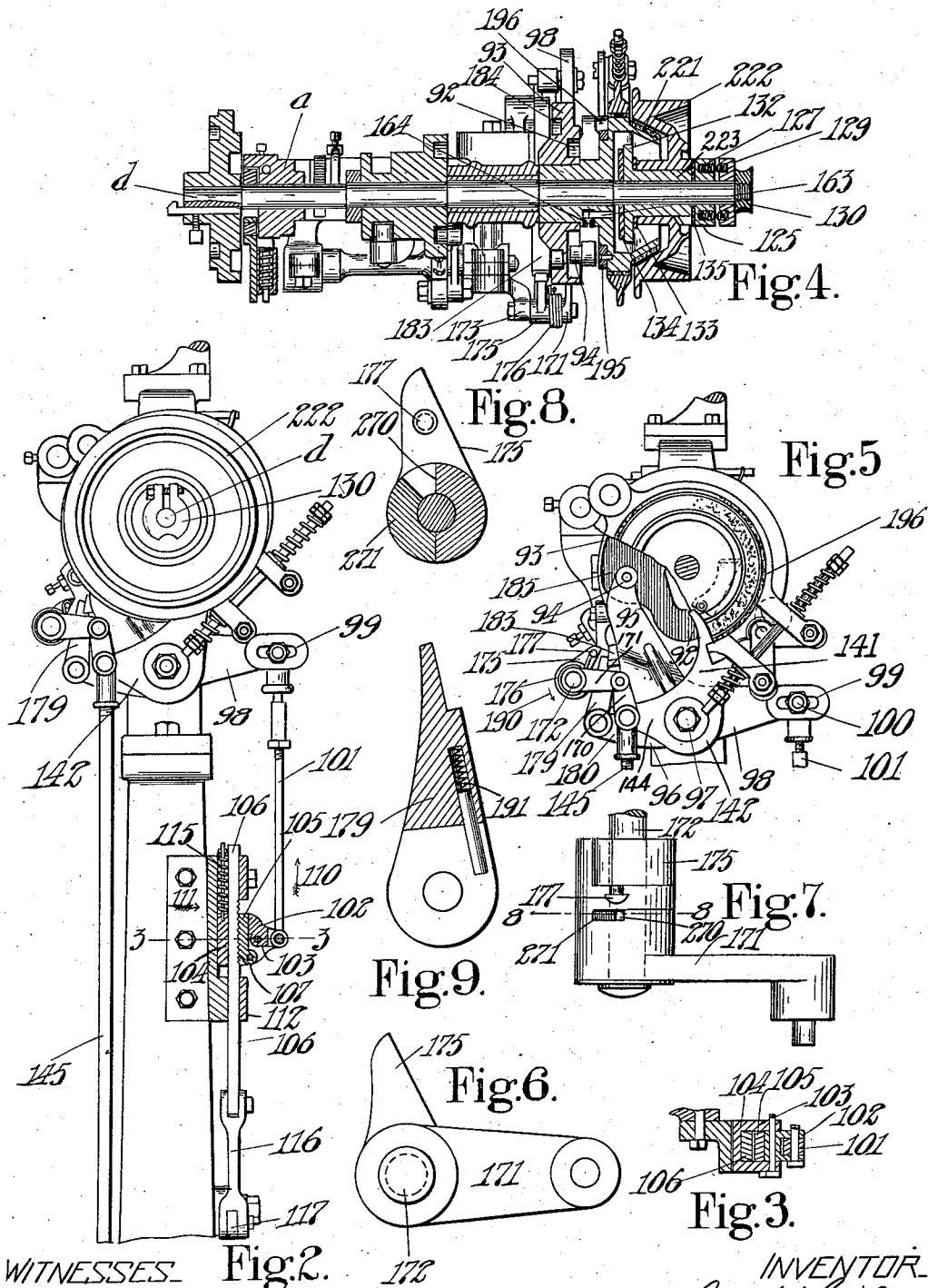
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2 SHEETS-SHEET 2.



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UNITED STATES PATENT OFFICE.

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WORK-SUPPORT.

1,014,353.

Specification of Letters Patent.

Patented Jan. 9, 1912.

Original application filed July 1, 1899, Serial No. 722,505. Divided and this application filed July 17, 1909. Serial No. 508,184.

To all whom it may concern:

Be it known that I, JOSEPH M. WIGGIN, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Work-Supports, 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 work supports and to mechanisms for controlling the movements of work supports and for determining their positions of rest.

In general the invention aims to provide an improved work support and controlling mechanism therefor for use with boot and shoe machinery, the type of work support to which the invention especially relates being that frequently used in machines for inserting fastenings and which is preferably controlled by mechanism constructed and arranged to depress it to permit the work to be fed freely thereover after an inserting operation and to effect a final depression of the work support of greater magnitude than the work feeding depression to permit the work to be readily removed from or placed upon the work support.

More specifically the invention aims to improve the construction and operation of the mechanism for effecting the feeding depression of the work support whereby uniform release of the work for different thicknesses of the work may be obtained, to render the action of this releasing mechanism more positive and to simplify its construction, particularly as regards the number of parts of which it is composed.

Other objects of the invention are to provide improved mechanism for effecting the final depression of the work support and to provide a novel and improved work support having capacity for adjustment to adapt it to a great variety of styles and kinds of work.

For purposes of illustration the invention is shown as embodied in a nailing machine of the type disclosed in my co-pending application, Ser. No. 722,505, filed July 1, 1899, of which application the present application

is a division, the said co-pending application having now matured into Letters Patent No. 931,107, dated August 17, 1909.

In the accompanying drawings,—Figure 1 is a side elevation of the upper part of the machine disclosed in my co-pending application, having embodied therein the invention of this application; Fig. 2 is a rear elevation, with parts in section, of the machine shown in Fig. 1; Fig. 3 is a detail section on the line 3—3 of Fig. 2; Fig. 4 is a horizontal section through the head of the machine; Fig. 5 is a detail elevation with parts broken away of the mechanism located in front of the loose driving pulley; and Figs. 6, 7, 8 and 9 are detail views of parts incompletely shown in the other figures.

The framework of the machine which supports the operating parts comprises, as herein shown, the head *a*, an upright or post *b* and a base suitably connected together. The head *a* supports in suitable bearings a main or driving shaft *d* upon which the various cams are mounted and to which the loose pulley may be clutched to start the machine in operation. The fastening inserting mechanism, the work feeding mechanism and related parts will not be herein specifically described, as they constitute a part of the subject-matter of the co-pending application above identified, and for a fuller understanding of the construction of these mechanisms reference may be had to the said co-pending application. It will be sufficient for the purposes of this specification to state that the operations upon the shoe are performed through a plate or work abutment 57 against the under side of which the work bears, and that the lateral position of the work with respect to the inserting mechanism is determined by an adjustable gage 72.

The horn or work support 70 is preferably laterally adjustable with relation to the path of movement of the driver to adapt it to different kinds of work and in particular, when used with a machine of the type of that herein disclosed, to insure that the heels of different widths shall bear level against the presser plate or work abutment 57 and to compensate for differences in the thickness of the innersole. This result is accom-

plished in the construction herein shown by fitting the bottom 74 of the horn in a dove-tailed slot in the split upper end of a sleeve 75, see Fig. 1, and securing it therein by a clamping screw 76. The sleeve 75 is fitted upon a portion 77 movable in bearings 78, 79 attached to the upright *b* and is connected at its lower end to a rod 80 which is loosely extended through a suitable treadle (not shown) and provided below the same with a nut. The upper end of the post 77 is provided with a threaded portion 83 and a smooth portion 84 of smaller diameter, the latter fitting accurately a smooth upper portion 85 of the bore of the sleeve 75, and the threaded portion 83 engaging screw threads on the larger portion 86 of said bore, as shown in Fig. 1. The sleeve 75 is vertically adjustable by means of the screw threaded portion 86 and is firmly locked in its adjusted position by a nut 87. A strong, rigid and simple horn construction is thus provided.

The horn is normally elevated or pressed toward the plate 57 by a spring 89 which encircles it between the bearings 79 and a collar 90 fast on the post 77. The horn 70 is adapted to be lowered in opposition to the spring 89 by a cam, preferably by the cam-shaped groove 92, see Fig. 4, in the rear face of a disk 93 fast on the main shaft *d*, this cam groove being suitably shaped to lower the horn a sufficient distance to release the work and permit it to be fed by the awl. The cam disk 93 is connected to the horn by novel mechanism now to be described.

The cam groove 92 has extended into it the stud or roller 94 carried by an upwardly extending arm 95 of the lever 96, see Fig. 5, mounted upon the pivot pin or stud 97 attached to the frame of the machine. The lever 96 has an arm 98 provided with a slot 99 in which is adjustably secured a pin or stud 100 attached to the upper end of a connecting rod 101, see Fig. 2, pivotally secured at its lower end to a clamping bolt or lever 102, see Figs. 1 and 2, mounted on a pivot pin 103 supported in the open sides of a yoke-shaped clamp 104 which coöperates with a pallet bar 105 to connect a rack bar 106 with the connecting rod 101. The pallet bar 105, in the present instance, is pivoted at its lower end at 107 between the sides of the yoke-shaped clamping member 104 and in order to effect a stronger and surer connection between the rod 101 and rack bar 106 and thereby increase the durability of the machine the pallet bar 105 has its face which coöperates with the rack bar made straight and provided with a plurality of teeth which engage a plurality of teeth of the rack bar.

The pallet bar is movable toward and from the rack bar in such manner that all, or substantially all, of its teeth will engage corresponding teeth on the rack bar simul-

taneously, and in the present instance this result is effected by pivoting the pallet bar at its lower end at such a distance from the rack bar that the pallet bar occupies a substantially vertical position parallel with the rack bar when in its engaged or operative position, as shown in Fig. 2. The pallet bar may be positively disengaged from its co-operating rack bar but it is preferable to have it self-releasing, or automatic in its action. This may be effected by setting the teeth on the rack bar and the teeth on the pallet bar otherwise than at right angles to the backs of said bars.

By an inspection of Fig. 2 it will be seen that when the rod 101 is moved upward in the direction of the arrow 110, the first movement of the said rod forces the dog or bar 102 into engagement with the upper or free end of the pallet bar 105 and forces the latter into engagement with the rack bar 106 and further movement of the bar 101 transfers the fulcrum of the pallet bar to its upper end which bears against the rack bar and renders the pivoted end movable to the extent that the clamping yoke is moved in the direction indicated by the arrow 111, Fig. 2, and brings the back portion of the yoke clamp 104 into solid or firm engagement with the back of the rack bar, which is thus firmly clamped on its front and rear sides or faces.

The release or disengagement of the pallet bar takes place on the downward movement of the connecting rod 101 by the yoke-shaped clamping member 104 striking the lower guide arm 112 of the rack bar. The yoke-shaped clamping member 104 has its upper surface engaged by a spring 115 which acts to cushion the movement of said clamping member when it strikes the upper guide arm 112. The rack bar 106 has its lower end connected by a link 116 to one end of a lever 117 pivoted to the upright *b* and having its short arm 118 connected to the post 77 above the base of the machine, and in the present instance the arm 118 is provided with a slot 119 into which extends a block 120 mounted on a pin or stud 121 projecting from the collar 90.

On reference to Fig. 1 it will be seen that the mechanism for connecting the horn to the cam 92 is located above the post and is readily accessible for repairs and compensates for different thicknesses of the work.

The clutch by which the loose pulley 222 is connected to the main shaft *d* is not herein specifically described but constitutes a part of the subject-matter of a co-pending application Serial No. 508,183, of even date herewith. It will be sufficient for the purposes of this specification to state that the loose pulley 222 which is carried upon the bushing 223 is moved longitudinally on the shaft *d* in one direction by a spring-pressed

collar 125 which, as shown, is provided with sockets into which extend helical springs 127 which fit into sockets in a collar 129 held on the shaft by a clamping nut 130. The movable member of the clutch is positively disengaged from its cooperating fixed member by a suitable mechanism comprising a rod 145 connected at its upper end to the shorter arm 144 of a lever 142 mounted on the pivot stud or pin 97 and connected at its lower end to a suitable foot treadle pivoted in the base. The shipper lever 142 is connected with suitable brake mechanism not herein specifically described by which the main shaft *d* is stopped at the end of its rotation.

The cam groove 92, as above described, lowers the horn a sufficient distance to permit the work to be fed, which distance is not sufficient to permit the work to be removed, and for this purpose automatic mechanism is preferably provided. The lever 142 has its short arm 144 connected by a link 170 to a crank arm 171 of a rock shaft 172 having bearings in a boss 173 attached to the head *a*, see Fig. 4. The rock shaft 172 has loose on it an arm or dog 175, see Figs. 4 and 5, normally pressed forward by a spring 176 having one end fast to the crank arm 171 and the other end engaging a pin 177 on the arm or dog 175. The hub of the crank arm 171 has a projection 270, see Figs. 7 and 8, with which cooperates a projection 271 on the hub of the dog 175 to limit the forward movement of the dog caused by the spring and to limit the backward movement of the dog, this latter movement being effected by an upwardly extending latch arm 179 which is pivoted to an extension or short arm 180 of the horn lowering lever 96 and is provided at its upper end with a notch, see Fig. 9, which is adapted to be engaged by the lower end of a lever 183, see Fig. 4, which is pivoted to a boss attached to the head *a*.

The lever 183 is operated, as herein shown, by a cam groove 184 in the front face of the cam disk 93 into which groove extends a suitable roller or projection on the lever 183. The cam groove 184 is suitably shaped to cooperate with the roller on the lever 183 and to move the said lever 183 a greater distance than the lever 96 is moved by its cam 92, so that when the latch arm 179 is engaged with the lever 183 the horn lowering lever 96 will be given an increased movement and the horn will be lowered an increased distance which is sufficient to enable the operator to take off and put on work. To permit this extra movement of the lever 96 the cam groove 92 is enlarged for a portion of its length, as shown at 185, see Fig. 5. The arm 179 may be permanently engaged with the lever 183 so as to positively connect the lever 183 with the

lever 96, this being permissible by reason of the enlargement 185 of the cam 92, but in the preferred construction the arm is disconnected from the lever 183 during the operation of the machine and is connected therewith just prior to the stopping movement. The disengagement of the arm 179 is controlled by the dog 175 which is moved by the treadle. When the treadle is depressed to start the machine the rock shaft 172 is rocked in the direction indicated by the arrow 190, Fig. 5, through the link 170 and crank 171 and the dog 175 is positively moved back away from the path of movement of the arm 179 a sufficient distance to permit said arm to be moved backward by the beveled end of the lever 183, and when the lever 183 in its upward movement has cleared the latch arm a spring 191, see Fig. 9, throws the latch arm away from the lever 183 and against the dog 175, thereby enabling the lever 183 to be operated by its cam without performing any work. As shown in Fig. 9 the spring 191 is located in the socket at one side of the longitudinal center of the arm 179 and bears against the end of said socket and against a pin which engages the extension 180 of the lever 96.

When it is desired to stop the machine, pressure is removed from the treadle and its spring moves the rod 145 downward thereby drawing down on the crank arm 171, rocking shaft 172 in a direction opposite to that indicated by arrow 190 which moves the dog 175 and the latch arm 179 forward, and if the foot treadle is released immediately after a nail has been driven the notched portion of the arm 179 is brought forward into engagement with the beveled end of the lever 183 as the latter is being moved downward and the continued downward movement of the lever 183 will turn the horn lowering lever 96 so as to lower the horn a sufficient distance to permit the work to be removed. At or about the time the horn has reached the lowered position just described, the arm 141 of the shipper lever 142 will release the clutch, the brake being applied to the fixed member of the clutch substantially simultaneously with its release. Mechanism is also preferably provided for preventing the lowering of the horn until after the nail has been driven when the foot treadle is released just before the nail is driven. The dog 175 is loose on the rock shaft 172 so that in case the lever 183 should be in its lower position when the treadle is released the latch arm 179 will yield as the lever 183 is moved upward.

In the following claims the term "horn" has been used to designate the work support, but it will be understood that the invention is not limited to the type of work support usually designated by this term.

Having 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 vertically movable horn, a cam for moving
5 said horn and work thickness compensating connections between said cam and said horn comprising a rack bar, a pallet bar pivoted at one end and means comprising a lever arranged to act upon said bar at or near its
10 other end for moving said pallet bar positively into locking engagement with said rack bar for the purposes specified.

2. In a machine of the class described, the combination of the following instrumentalities, viz:—a vertically movable horn, a
15 cam shaft provided with a disk or hub having a cam groove shaped to lower the horn sufficiently to effect the feed of the work and provided with an enlargement to permit further downward movement of the horn, a lever connected to said horn and acted upon
20 by said cam groove, a second cam groove having a greater throw than the first mentioned cam groove, a lever positively controlled by said second cam groove, and means to connect said second lever with the first mentioned lever, whereby the second mentioned cam groove may lower the horn a
25 greater distance than the first mentioned cam groove, for the purpose specified.

3. In a machine of the class described, the combination of the following instrumentalities, viz:—a vertically movable horn, a
35 cam shaft provided with a cam disk or hub having a cam groove shaped to lower the horn sufficiently to permit the feed of the work and provided with an enlargement to permit further downward movement of the horn, a lever connected to said horn and acted upon by said cam groove, a second cam
40 groove having a greater throw than the first mentioned cam groove, a lever acted upon by said second cam groove, a spring actuated latch arm having a notched end which is
45 engaged by said second mentioned lever, a rock shaft, a dog loose on said rock shaft, a spring to act on said dog, and means to operate said rock shaft, substantially as described.

4. In a machine of the class described, the combination of the following instrumentalities, viz:—a vertically movable horn, a
50 cam shaft provided with a cam disk or hub having a cam groove shaped to lower the horn sufficiently to effect the feed of the work and provided with an enlargement to permit further downward movement of the horn, a lever connected to said horn and acted upon by said cam groove, a second cam
55 groove having a greater throw than the first mentioned cam groove, a lever acted upon by said second cam groove, a latch arm connected to the first mentioned lever and adapted to engage the second mentioned lever, a rock
60 shaft, a dog on said rock shaft to engage the

latch arm with the second mentioned lever, and a foot treadle connected to said rock shaft, substantially as described.

5. In a machine of the class described, the combination of the following instrumentalities, viz:—a vertically movable horn,
70 a spring to normally move it upward, a main shaft, a cam disk thereon having a cam groove, a lever having a stud or roller extended into said cam groove, said groove being shaped to lower said horn a sufficient
75 distance to permit the work to be fed and provided with an enlargement to permit the horn to be lowered a further distance, a latch arm pivoted to said lever, a dog to act on said latch arm, a rock shaft on which said
80 dog is mounted, a foot treadle connected to said rock shaft, a second cam groove in said disk, a lever cooperating therewith and adapted to engage said latch arm when the pressure is relieved from said foot treadle, substantially as described.

6. In a machine of the class described, the combination of the following instrumentalities, viz:—a vertically movable horn, a
90 spring to normally move it upward, a main shaft, a cam disk thereon having a cam groove, a lever having a stud or roller extended into said cam groove, said groove being shaped to lower said horn a sufficient
95 distance to permit the work to be fed and provided with an enlargement to permit the horn to be lowered a further distance, a latch arm pivoted to said lever, a dog to act on said latch arm, a rock shaft on which said
100 dog is mounted, a crank or arm on said rock shaft, a shipper lever, a link connecting said crank to said shipper lever, and a foot treadle connected to said shipper lever, substantially as described.

7. In a machine of the class described the combination of the following instrumentalities, viz:—a vertically movable horn, a
110 spring to normally move it upward, a main shaft, a cam disk thereon having a cam groove, a lever having a stud or roller extended into said cam groove, said groove being shaped to lower said horn a sufficient distance to permit the work to be fed and provided with an enlargement to permit the
115 horn to be lowered a further distance, a latch arm pivoted to said lever, a dog to act on said latch arm, a rock shaft on which said dog is mounted, a crank or arm on said rock shaft, a shipper lever, a link connecting said crank to said shipper lever, and a
120 foot treadle connected to said shipper lever, and a cam to engage said shipper lever and prevent its prematurely actuating the dog on the crank shaft when the pressure is removed from the foot treadle, substantially as described.

8. In a machine of the class described, the combination of the following instrumentalities, viz:—a vertically movable horn, a cam
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shaft provided with a cam to lower said horn, and an intermediate connection from said cam to said horn, which includes a rack bar, a pivoted pallet bar provided on one of its faces with a plurality of teeth, a yoke-shaped clamp embracing said rack bar and to which said pallet bar is pivoted, a clamping dog or lever pivoted to the yoke-shaped clamp and engaging the said pallet bar, and means connected to said clamping dog and actuated by the cam on the cam shaft to move said pallet bar into engagement with said rack bar, for the purpose specified.

9. In a machine of the class described, the combination of the following instrumentalities, viz:—a vertically movable horn, a cam

shaft provided with a cam to lower said horn, and an intermediate connection from said cam to said horn, which includes a rack bar, a pallet bar provided on one of its faces with a plurality of teeth, a yoke-shaped clamp embracing said rack bar and to which said pallet bar is pivoted, and means carried by said clamp to move said pallet bar positively into engagement with the said rack bar, for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEPH M. WIGGIN.

Witnesses:

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