March 2, 1926. 1,575,596

F. E. WARNER

FASTENER SETTING MACHINE

Filed April 22, 1924 2 Sheets-Sheet 1

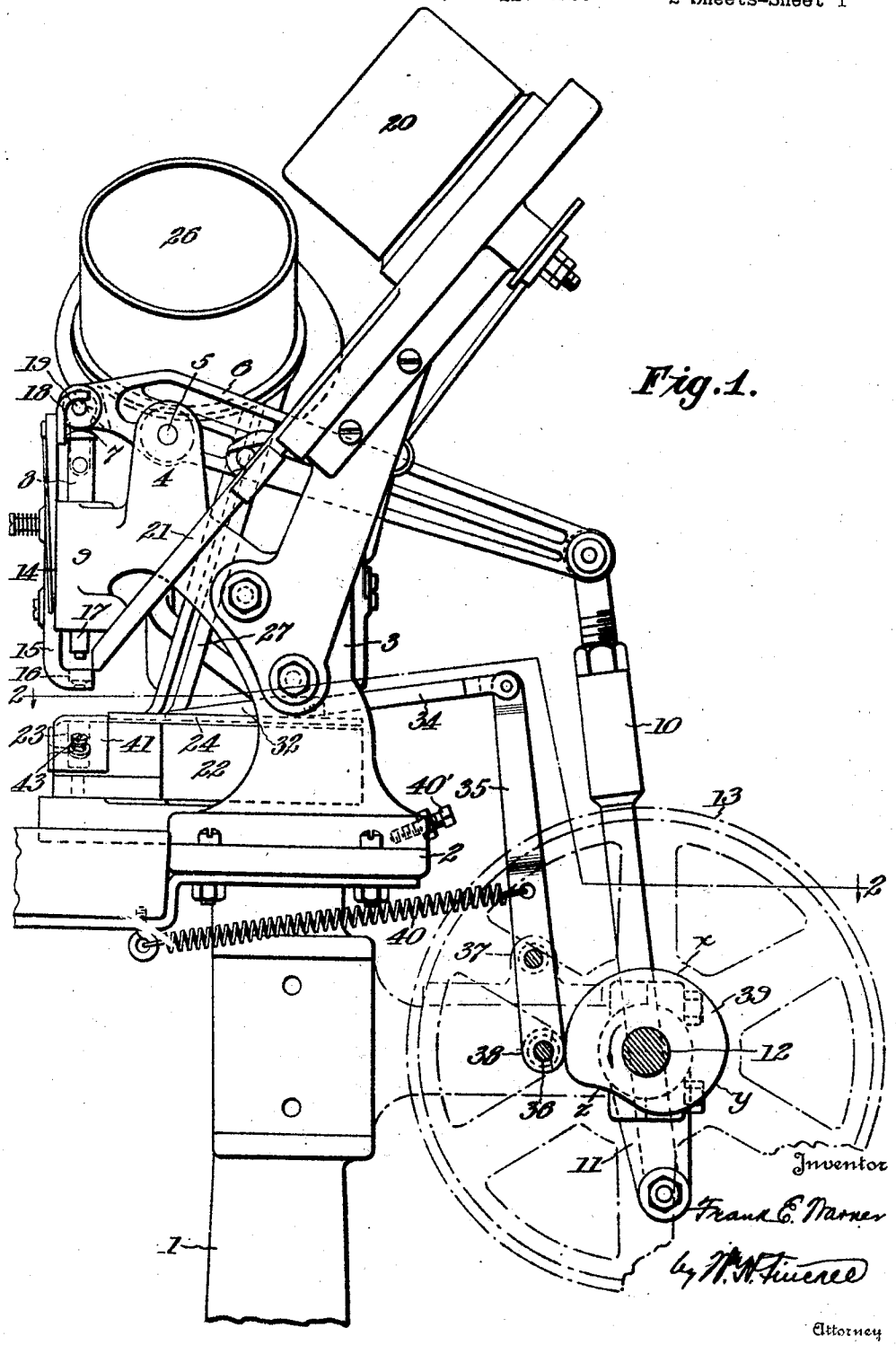


Fig. 1.

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Filed April 22, 1924 2 Sheets-Sheet 2

Fig. 2.

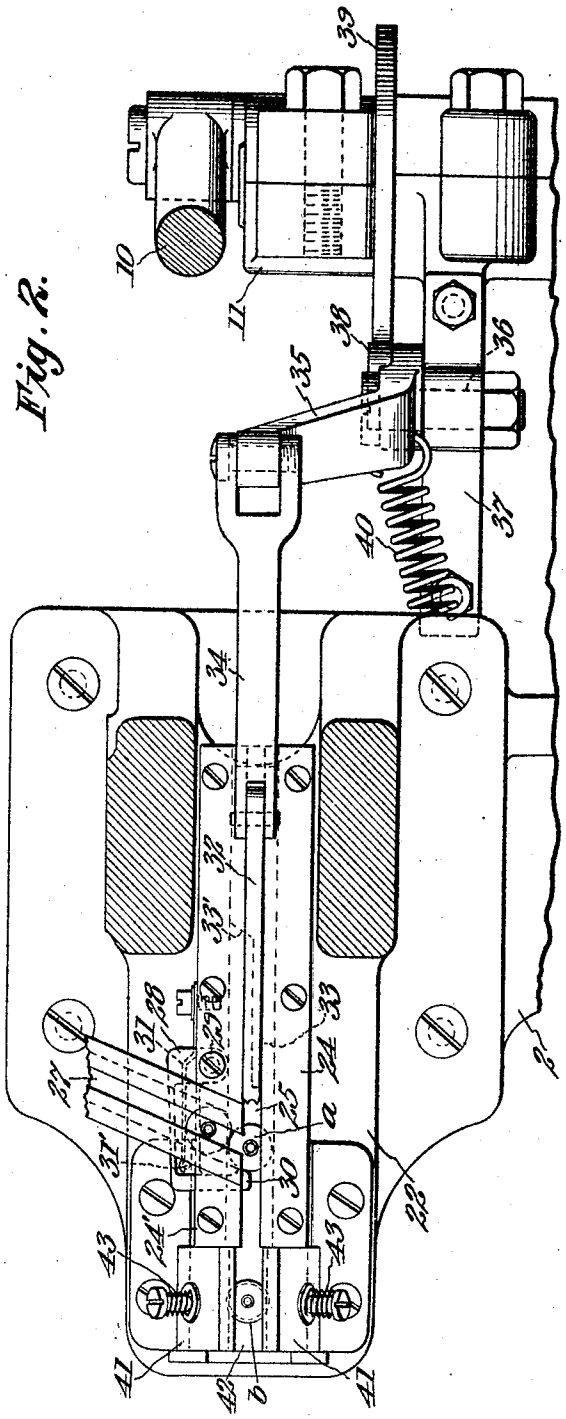


Fig. 4.

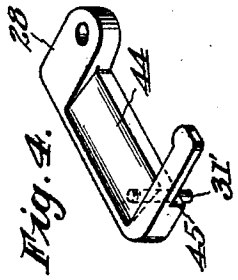
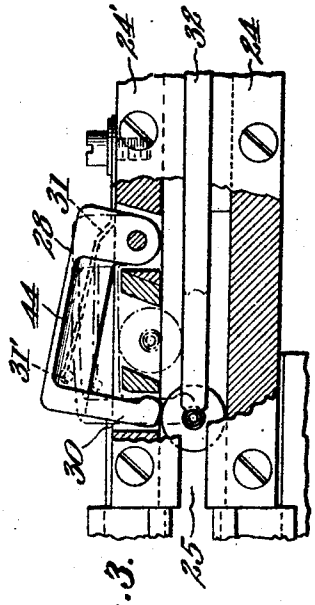


Fig. 3.



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Patented Mar. 2, 1926. 1,575,596

UNITED STATES PATENT OFFICE.

FRANK E. WARNER, OF WATERBURY, CONNECTICUT, ASSIGNOR TO SCOVILL MANUFACTURING COMPANY, OF WATERBURY, CONNECTICUT, A CORPORATION OF CONNECTICUT.

FASTENER-SETTING MACHINE.

Application filed April 22, 1924. Serial No. 708,255.

To all whom it may concern:

Be it known that I, FRANK E. WARNER, a citizen of the United States, residing at Waterbury, in the county of New Haven and State of Connecticut, have invented a certain new and useful Improvement in Fastener-Setting Machines, of which the following is a full, clear, and exact description.

This invention relates to fastener setting machines, and is in the nature of an improvement on machines of the type shown and described in the patent of Frederick E. Stanley, No. 1,182,594, granted May 9, 1916.

The object of the invention is to provide means for controlling and performing the feed of fastener parts to the setting anvil of the machine, whereby great accuracy is attained and failure of the fastener feeding mechanism practically eliminated.

The invention consists in a fastener attaching machine comprising essentially a setting anvil, a setting plunger mounted for reciprocation relatively to the anvil, means for feeding and positioning fastener parts in operative position with relation to said plunger, and means for feeding fastener parts to the setting anvil, including a raceway, a chute arranged to receive fastener parts from a suitable hopper or other appropriate source and to deliver such parts to the raceway, a detent arranged in cooperative relation with respect to the discharge end of the chute and adapted to permit one fastener part at a time to be delivered from said chute to the raceway, means cooperating with the raceway and adapted to advance fastener parts discharged thereto from said chute into setting position upon the anvil, means for imparting reciprocation to the plunger, and means for imparting appropriate movements to the fastener part advancing means in timed relation to the reciprocation of the plunger, as I will proceed now to explain and finally claim.

In the accompanying drawings illustrating the invention, in the several figures of which like parts are similarly designated, Figure 1 is a side elevation of a machine embodying my invention, parts thereof being broken away to more clearly show the operating mechanism. Fig. 2 is a sectional plan taken substantially in the plane of line 2—2, Fig. 1, parts being omitted in the interest of clearness. Fig. 3 is a sectional plan of the raceway, detent and push finger and illustrating the mode of operation of these parts. Fig. 4 is a detail perspective view of the detent detached.

Mounted upon a suitable stand 1 is a table 2 carrying a head 3 provided with a bearing 4 in which is pivotally mounted at 5 a lever 6. This lever is connected by a link 7 with a plunger 8 arranged for reciprocation in a bearing block 9. The lever 6 is actuated through an adjustable link 10 by means of a crank 11 fixed to and rotatable with a shaft 12 carrying a drive pulley 13, so that upon rotation of the shaft 12, in the direction of the arrow, Fig. 1, the lever 6 will be oscillated and the plunger 8 thereby reciprocated.

Slidably mounted upon the face 14 of the bearing block 9 is a pair of jaws 15 forming between them a fastener part receiving socket 16 at their lower ends. These jaws are adapted to be moved downwardly by cooperation of the end 17 of the plunger 8 with a fastener part held in the socket formed by the jaws, and are moved upwardly by means of fingers 18 arranged for engagement with a pin 19 carried by lever 6. These jaws are similar to, and operate in substantially the same manner as, those shown and described in the Stanley patent above mentioned. Fastener parts are fed to the socket 16 of the jaws 15 from a hopper 20 by means of a chute 21, and any appropriate cut-off mechanism (not shown) may be provided in combination therewith for controlling this feed so that the fastener parts will be fed one at a time.

Fixed upon the table 2 is a bed 22 which extends forward to the anvil 23, and upon this bed is arranged a pair of guides 24, 24′ parallel to each other and forming between them a raceway 25 extending into proximity to the anvil 23.

Fastener parts are fed from a hopper 26 through a chute 27 to the raceway 25 formed by the guides 24, 24′, and for the purpose of preventing the entrance into the raceway from the chute of more than one fastener part at a time, I provide a detent 28 suitably pivoted at 29 as to the guide 24′ and to the bed 22, and provided with a finger 30 extending beneath the guide 24′ and

normally partially obstructing the raceway 25. This detent is normally held with its finger in raceway obstructing position by means of a spring or other resilient member 31, fixed at one end to the bed 22 and at its other end engaging a pin 31′ carried by the detent. By this arrangement it will be seen that as fastener parts descend the chute 27 they will slide into the raceway and will be stopped therein in the position indicated at *a*, Fig. 2, by the finger 30 and will thereby stop the fastener parts behind them in the chute.

Cooperatively arranged in the raceway is a push finger 32 provided with wings 33, 33′ which underlie the overhanging portions of the guides 24, 24′, respectively, and which prevent tilting or any other movement of the push finger than reciprocation longitudinally of the raceway. This push finger is actuated through a link 34 connected with a lever 35 pivoted at 36 to a bearing bracket 37, or other part of the frame of the machine, and carrying at its lower end a roller 38 riding upon the surface of a cam 39 mounted upon the shaft 12 and rotatable therewith. As will be seen, particularly by reference to Fig. 1, this cam 39 imparts movement to the push finger to withdraw it from the anvil, and its feeding movement, whereby it moves a fastener part from the position indicated at *a*, Fig. 2, to a position over the anvil indicated by *b*, is imparted to it by a spring 40 or other appropriate resilient means. Fastener advancing movement of the lever 35 is limited by means of an adjustable stop screw 40′.

It will be seen, particularly by reference to Fig. 2, that as the push finger 32 moves under the influence of the spring 40, it will contact with a fastening part lying in the position indicated by *a* and move this fastener part through the raceway and onto the anvil 23, whereon the fastener part is held in appropriate setting position by means of cheek pieces 41 pressed normally against the inclined sides of the anvil block 42 by means of springs 43. This anvil block and its cheek pieces and their arrangement and mode of operation are substantially the same as the corresponding parts shown, described and claimed in the Stanley patent above mentioned.

As will be seen, particularly by reference to Figs. 3 and 4, the detent 28 is slabbed off or beveled as at 44 for the purpose of preventing interference with the chute 27, and its movement to raceway obstructing position under the influence of the spring 31 is limited by means of a shoulder 45.

The operation of the device would seem to be apparent from the foregoing description, but in the interest of clearness such operation may be stated as follows:—Starting with the parts in the position indicated in Figs. 1 and 2, it is first necessary, in order to start the operation of the machine, to advance a fastener part into position upon the anvil 23 and to do this the machine is operated through one complete cycle without introducing any article or material to which it is desired to attach the fasteners. Upon operation of the machine through this complete cycle, it will be seen that, as the shaft 12 rotates, it will move the plunger down, and during this downward stroke of the plunger the roller 38 of lever 35 will ride upon the concentric portion *x* of the cam 39, but when the downward stroke of the plunger is completed and the plunger commences to rise again, the eccentric portion *y* of the cam 39 will engage with the roller 38, and, under the influence of the spring 40, the push finger 32 will start in its movement toward the anvil 23. Continued rotation of the shaft 12 will bring the lowest portion *z* of the cam into contact with the roller 38, and at this time the push finger will have completed its fastener positioning movement and lever 35 will have engaged stop 40′. During this fastener positioning movement of the push finger 32 the following operations will occur:—The end of the push finger will first engage with the fastener part while it is in the position indicated at *a*, and by exerting pressure upon the fastener part will cause the detent, by means of pressure exerted upon the raceway obstructing end of the finger 30, to turn upon its pivot and allow the fastener part to pass it, as illustrated in Fig. 3. After passing the finger 30, the fastener part will be moved freely through the raceway until it comes into contact with the cheek pieces 41, and as it continues to advance, it will separate these cheek pieces sufficiently to allow it to pass between them while at the same time being frictionally engaged by them, and at the limit of the stroke of the push finger will come to rest directly over the anvil and in line with the plunger 8, and will be held by the cheek pieces in this position by their frictional engagement with it during the withdrawal of the push finger. As will be seen, particularly by reference to Fig. 3, the push finger 32 after it has moved the fastener part past the end of the finger 30 will obstruct the discharge end of the chute 27 and will prevent escape of the fastener parts from the chute.

As previously stated, any usual cut-off (not shown) may be used in connection with the chute 21 for controlling delivery of the fastener parts fed thereby so that they are fed one at a time to the socket 16 formed by the jaws 15, and it will be understood that, as is usual in this type of machine, complemental fastener parts are fed to the anvil 23 and the jaws 15 in such timed relation to the

reciprocation of the plunger that upon the descent of the plunger there will be such complemental fastener parts in position for setting.

Complemental fastener parts having been fed to the anvil and the socket of the jaws respectively, the machine is ready to attach the fastener, and if, now, the material or article to which the fastener is to be applied is properly positioned over the anvil and the machine again operated through a cycle of movements the complemental fastener parts will be united and the fastener attached to or set upon the material or article, and, during this setting operation, the mechanisms will operate, as previously described, to feed additional complemental fastener parts to the anvil and jaws upon completion of the setting operation. The operation of the machine may, thereafter, be repeated as desired.

It will thus be seen that I provide means wholly automatic in their operation and requiring no mechanical connection with other moving parts of the machine, for controlling feed of fastener parts from the chute to the raceway, thereby affording a simple and inexpensive arrangement which is perfectly satisfactory and effective in performing the functions required of it and which, moreover, is not apt to get out of order.

It will also be seen that by means of the provision of the cam actuated leverage for imparting the desired movements to the push finger, I am enabled, by appropriate setting of the cam upon its shaft, to exactly time the movements of the push finger in accordance with the functions required of it.

Therefore, it will be seen that by these improvements I provide a machine of few parts and simple operation without sacrificing anything of efficiency.

Various changes may be made in the details of construction and the arrangement of parts without departing from the spirit of the invention and the scope of the following claims.

What I claim is:—

1. In a fastener setting machine, a setting anvil, guides forming a raceway communicating with said anvil, a chute communicating with and adapted to supply fastener parts to said raceway, a detent pivoted adjacent to the discharge end of said chute and having a finger normally obstructing said raceway and underlying one of said guides and adapted to engage the heads of fastener parts fed to said raceway from said chute, whereby such fastener parts may be maintained in predetermined position in said raceway.

2. In a fastener setting machine, a setting anvil, a pair of guides forming a raceway communicating with said anvil, a chute communicating with said raceway and adapted to supply fastener parts thereto, a detent pivoted adjacent to the discharge end of said chute and having a finger normally obstructing said raceway and underlying one of said guides and adapted to maintain fastener parts in predetermined position in said raceway by engagement with their heads, a push finger arranged in said raceway and adapted to engage the heads and shanks of the fastener parts and provided with wings underlying said guides whereby it is capable only of sliding movement with respect to said guides, and means for actuating said push finger whereby by its sliding movement in said raceway the fastener parts positioned by said detent will be moved past the obstruction formed by same and advanced to said anvil, for the purpose specified.

In testimony whereof I have hereunto set my hand this 16th day of April A. D. 1924.

FRANK E. WARNER.