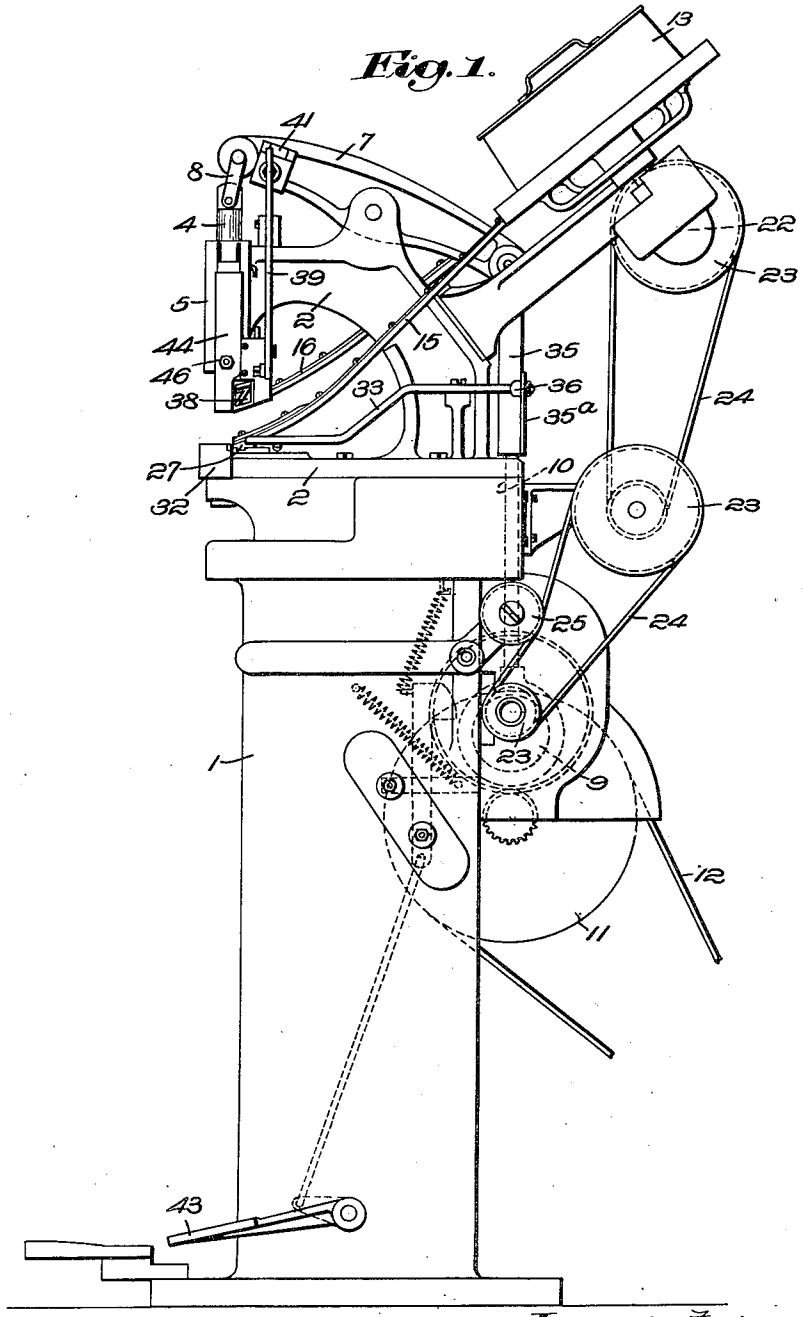
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FASTENER APPLYING MACHINE

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Fig. 1.

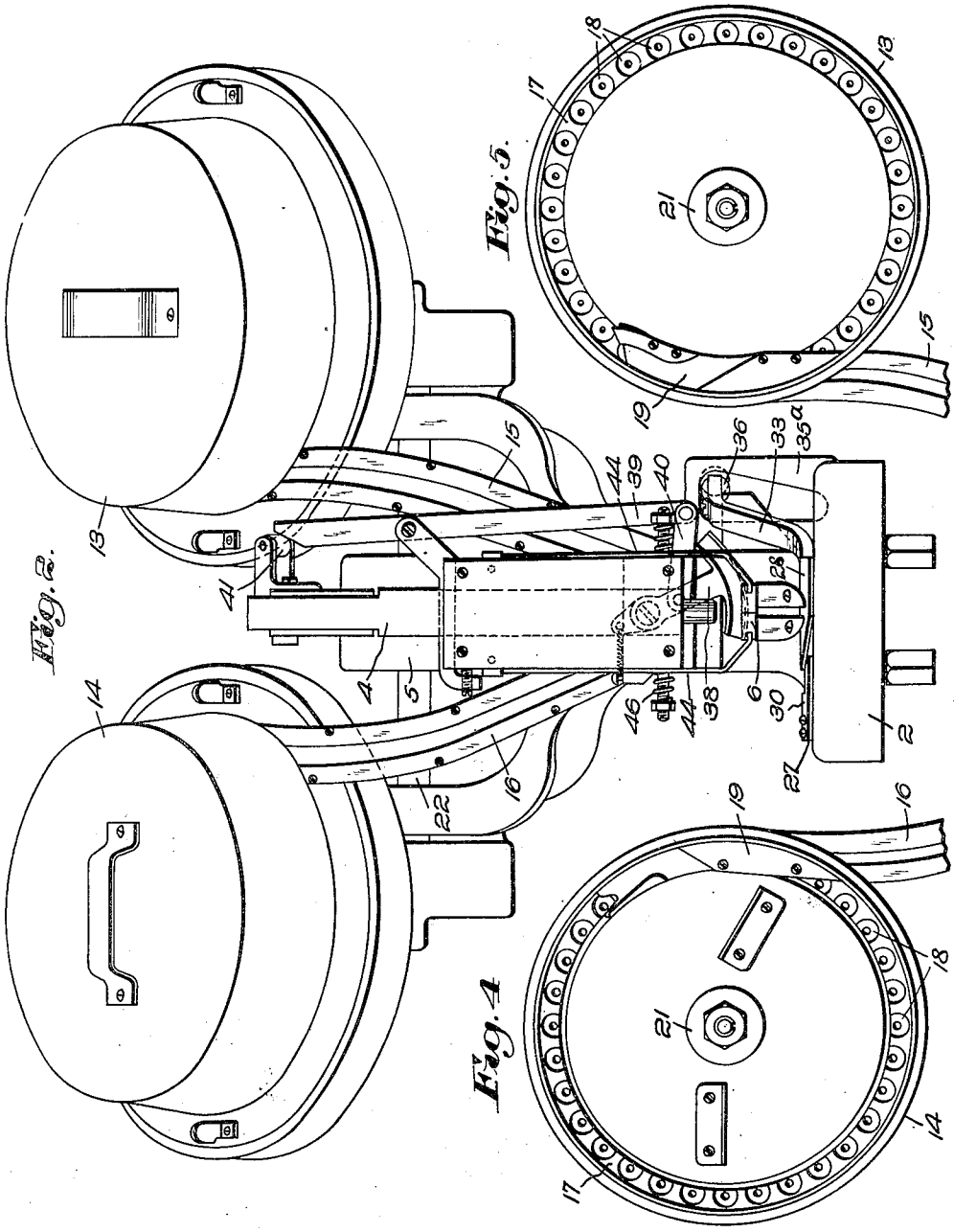


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FASTENER APPLYING MACHINE

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FASTENER APPLYING MACHINE

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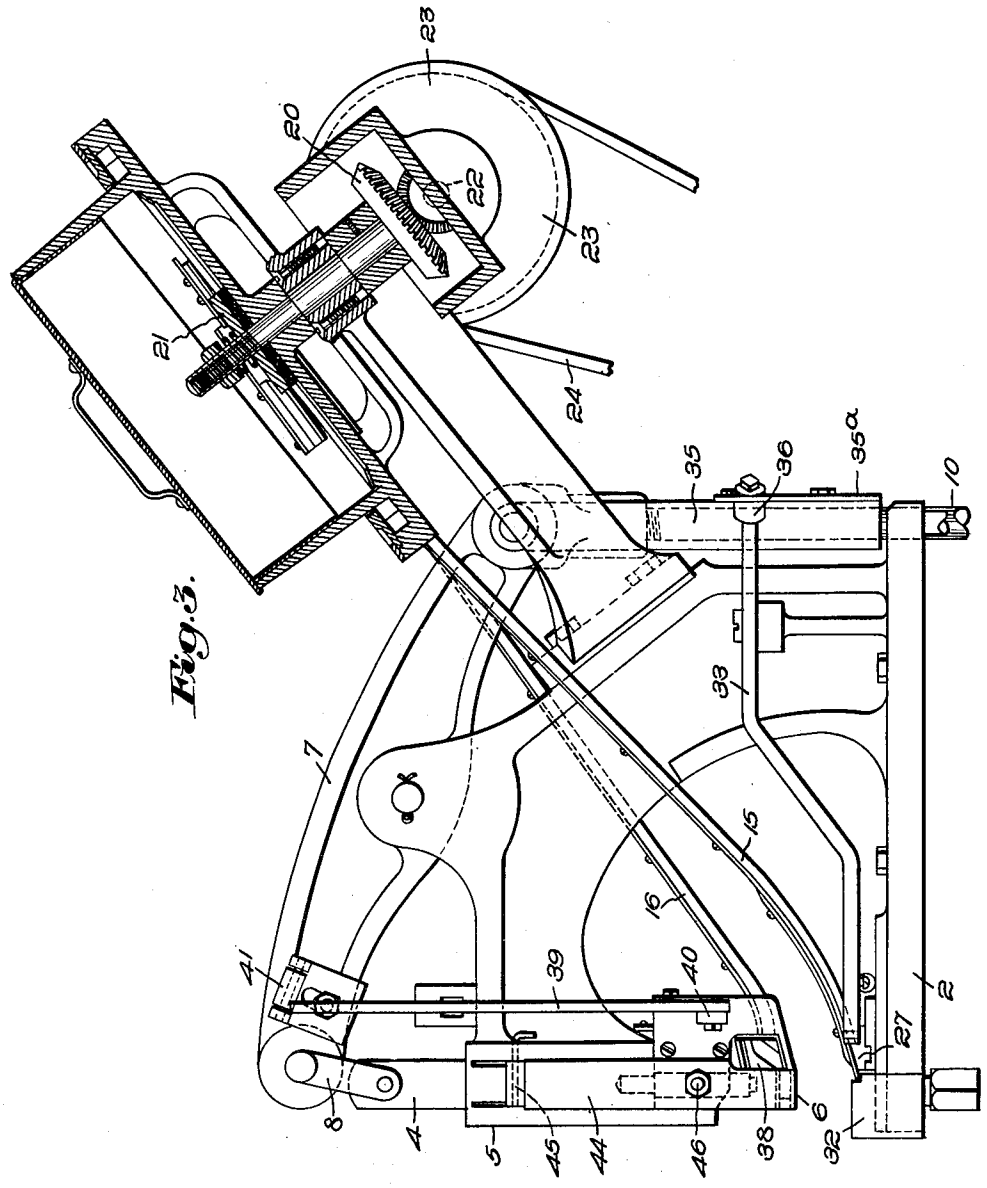


Fig. 3.

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FASTENER APPLYING MACHINE

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Fig. 6.

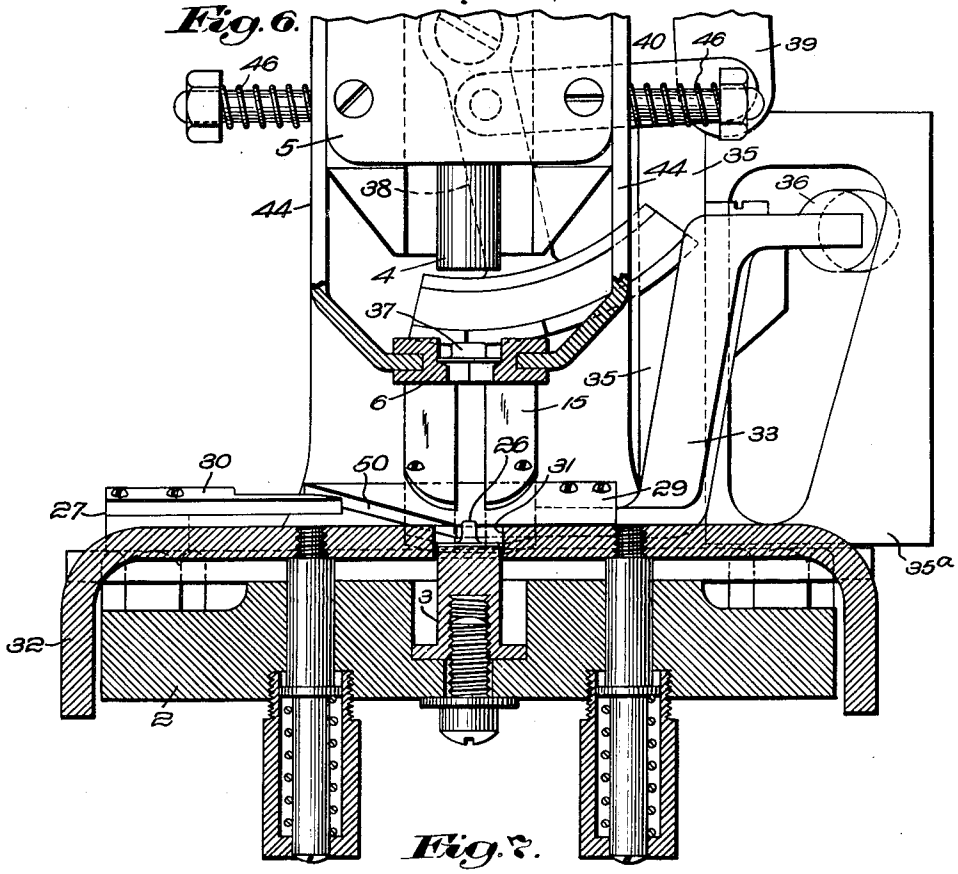
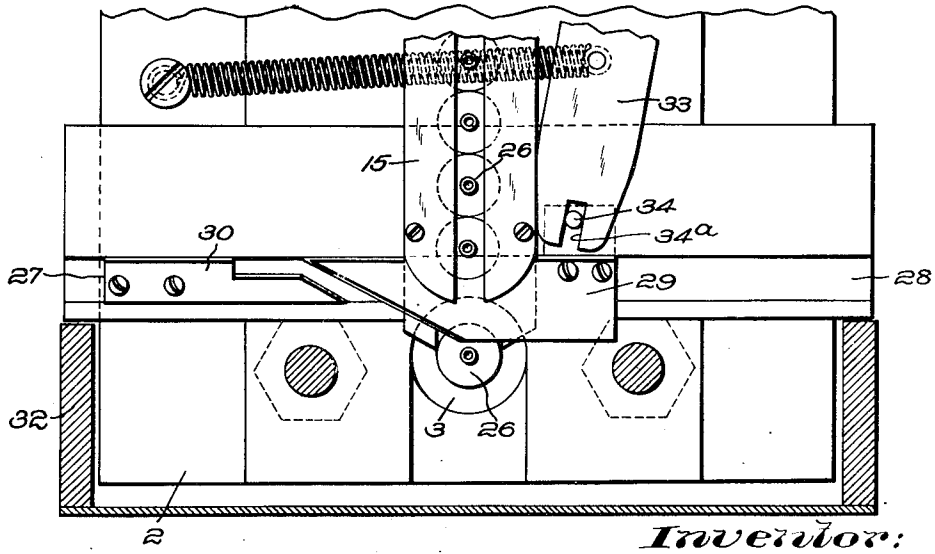


Fig. 7.



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Fig. 8.

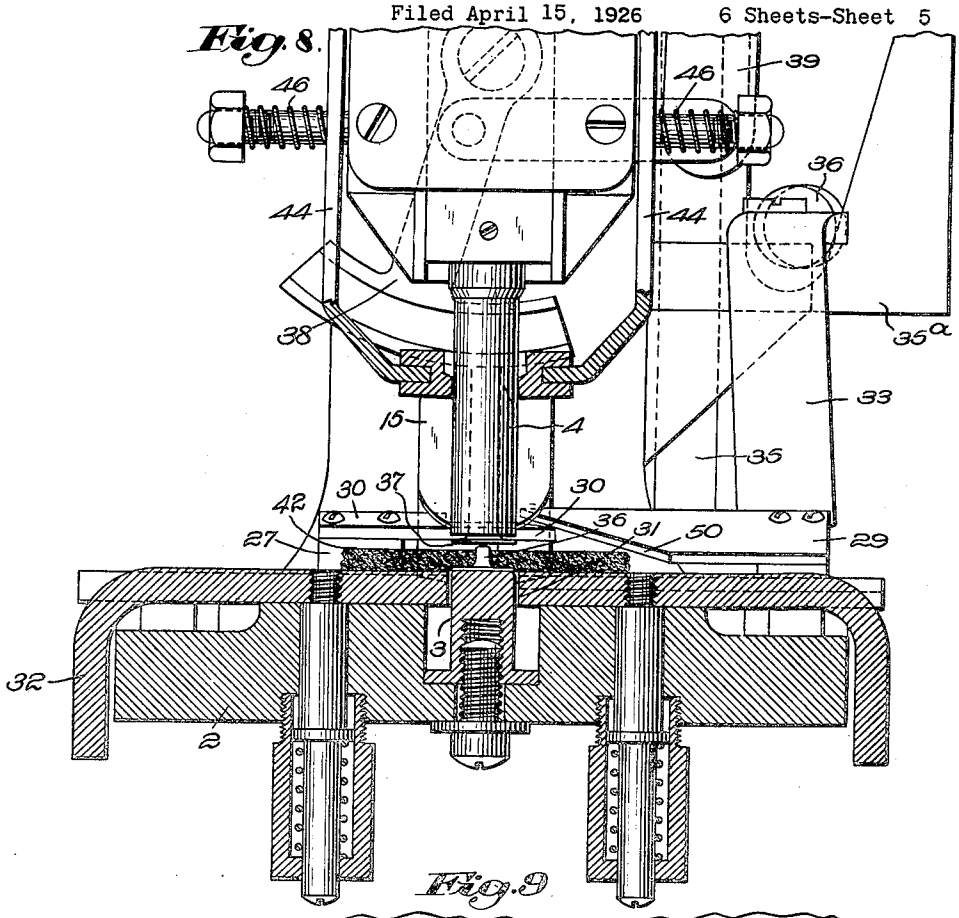
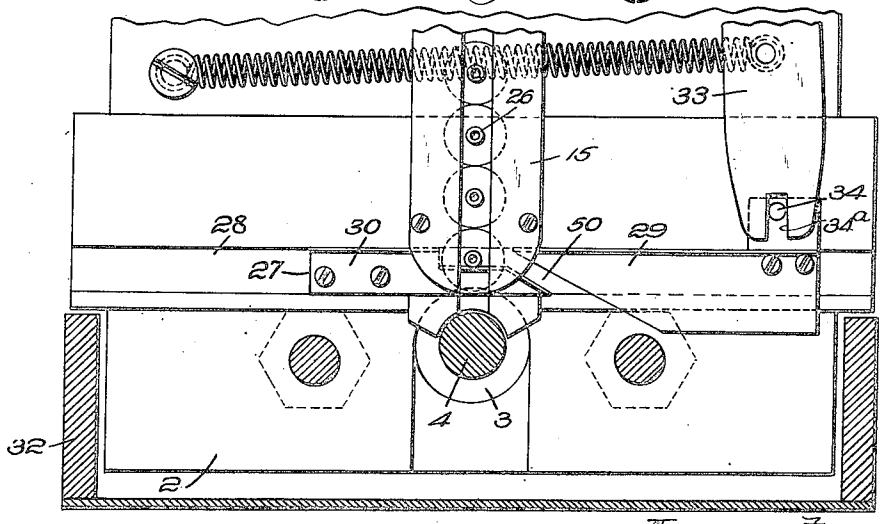


Fig. 9



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FASTENER APPLYING MACHINE

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Fig. 10.

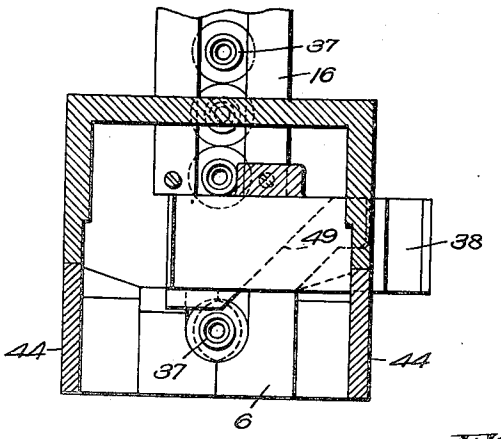


Fig. 11.

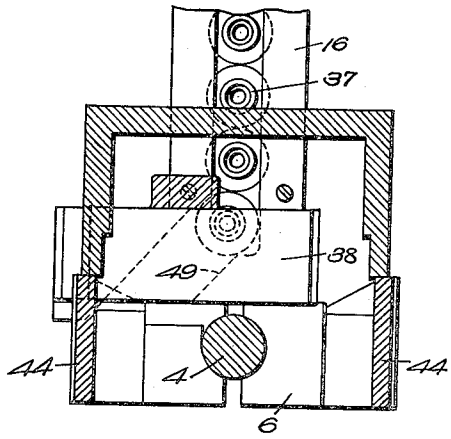


Fig. 12.

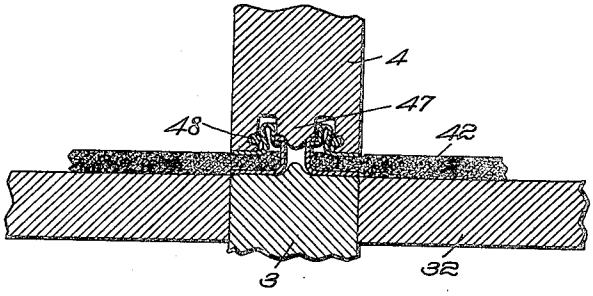


Fig. 13.

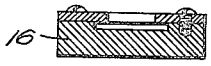
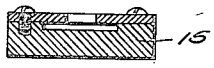


Fig. 14.



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Patented Dec. 29, 1931 1,839,176

UNITED STATES PATENT OFFICE

WALTER H. PIERCE, OF WATERTOWN, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO UNITED-CARR FASTENER CORPORATION, OF CAMBRIDGE, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS

FASTENER APPLYING MACHINE

Application filed April 15, 1926. Serial No. 102,316.

This invention aims to provide an improved machine for applying separable fastener parts to a suitable fastener carrying part.

In the drawings, which illustrate a preferred embodiment of my invention:—

Figure 1 is a side elevation of the entire machine;

Fig. 2 is a front elevation of the upper part of the machine;

Fig. 3 is a side elevation of that portion of the machine shown in Fig. 2, but showing one of the hoppers and associated mechanism partly in cross-section;

Figs. 4 and 5 are plan views of the hoppers and a portion of the guides, the covers of the hoppers being removed;

Fig. 6 is a detail view showing, partly in section and partly in elevation, the dies and associated mechanisms prior to operation of the dies toward each other;

Fig. 7 is a plan view, partly in section, showing the lower die and a portion of the mechanism for feeding the fastener parts to the die;

Fig. 8 is a view of the parts shown in Fig. 6 just prior to securing the fastener parts together, the part to which they are to be secured being omitted;

Fig. 9 is a view of the parts shown in Fig. 7 when in the position shown in Fig. 8;

Figs. 10 and 11 show detail plan views of the upper die mechanism for feeding the fastener parts to the upper die;

Fig. 12 is a cross-section through the upper and lower dies at the completion of their strokes and showing the fastener parts secured to their carrying support; and

Figs. 13 and 14 are cross-section views of the chutes for conveying the various fastener parts from the hoppers to their respective fastener holding parts.

Referring to the embodiment of my invention illustrated by the drawings, I have shown a machine for applying fastener parts to various articles, such for instance as gloves, upholstery coverings, curtains and the like, although its use is not limited to securing parts to any particular kind of goods or material. While I have shown a machine for applying the studs of separable fasteners to stud-carrying mediums, it should be understood that sockets may be secured by merely substituting or rearranging some of the parts of the machine, the manner of operation remaining substantially the same.

The machine selected for illustrative purposes comprises a base or standard 1, which supports some of the driving mechanism and also supports a frame part 2, which has the remainder of the mechanism mounted thereupon. At the front end of the base of the frame 2 is mounted, by means of a screw fastening (Fig. 6), an anvil part 3 which is interchangeable and may be of any suitable shape to receive one of the fastener parts as hereinafter described. Directly above this anvil 3 is located mechanism for receiving the other fastener part and for advancing it toward the anvil. This last-mentioned mechanism includes a reciprocable plunger or die 4, a guide 5 for the die 4 and a spreadable holder 6 for holding the last-mentioned fastener part as shown in Fig. 6.

At the top of the frame 2 is pivoted a rocker arm 7, one end of which is connected by links 8 to the plunger 4, the other end being connected to an eccentric 9 through a rod 10. The eccentric may be driven by any suitable means, but I have provided means driven by a pulley 11, which in turn is driven by the belt 12 connected to a motor or other suitable driving power (not shown).

Hoppers 13 and 14 for the fastener parts are mounted upon the frame 2 and tipped at an angle so that the fastener parts may be fed by gravity through the chutes 15 and 16 to the anvil 3 and holder 6. Each hopper is provided with a rotatable table 17, as shown in Figs. 3, 4 and 5, having a series of recesses 18 which "pick up" the fastener parts as the tables rotate. Stationary transfer devices 19 are provided within the hoppers to transfer the fastener parts from the rotating tables to the chutes 15 and 16, thereby providing for feeding a supply of fastener parts to the anvil 3 and holder 6. The tables 17 are driven through suitable gearing 20 and friction devices 21, as shown in Fig. 3, and the gearing for each table is driven from a sin-

gle shaft 22, which in turn is driven by means of pulleys 23 and belts 24 from the main driving mechanism of the machine, as shown in Fig. 1.

A hand-operated belt tightener 25 is secured to the side of the machine, as indicated in Fig. 1, and operates upon one of the belts 24 for the purposes more fully hereinafter described.

Rearwardly of the anvil 3, I have provided a sliding mechanism for feeding the fastener parts, which in this instance are rivets 26, from the end of the chute 15 to the anvil 3. This mechanism comprises a sliding part 27 slidable in a groove 28 in the base of the frame 2 and is provided with means in the form of two finger pieces 29 and 30 so arranged as to ride above the end portion of the guide 15. These fingers 29 and 30 are notched and beveled and arranged to provide a guide for permitting the rivets to pass, one at a time, from the chute 15 to the anvil 3. The upper end of the anvil 3 is partially surrounded by the wall 31 of an aperture cut in a resiliently supported table 32 and this wall 31 assists in centering the rivets 26 upon the anvil.

The means for reciprocating the sliding part 27 includes a lever 33, pivoted upon the base of the frame part 2 and connected to the slide by a pin 34 and slot 34*a* and a rod 35 carried by the rear end of the rocker arm 7, as shown in Fig. 3. The rod 35 carries a cam plate 35*a* which cooperates with a roller 36 at the rear end of the lever 33 for moving this lever about its pivot.

A mechanism for regulating the feed of the other fastener parts, which in this instance is the stud member 37, is also located between the holder 6 and the end of the chute 16 for feeding the studs to the holder 6. This mechanism includes a pivoted part 38 which is provided with notches and grooves to permit the studs 37 to pass one at a time from the end of the chute 16 to the holder 6. The pivoted part is swung backward and forward by a lever 39 pivoted at the side of the frame 2 and connected by a link 40 to the part 38. The lever 39 is operable by a cam roller 41 carried by the rocker arm 7 and operating against the upper end of the lever 39 in the manner hereinafter described.

Assuming that the chutes are supplied with fastener parts and that a stud part 37 is in the holder 6 and a rivet part 26 is on the anvil 3, as shown in Fig. 2, the operation of the machine to fasten these parts to the stud-carrying medium 42 as shown in Fig. 12 is as follows. The operator first places the carrying medium 42 upon the table so that the previously punched hole (if there be one) is placed over that portion of the rivet which protrudes above the plate 32. Now, assuming that power is being applied to the pulley 11, if the operator steps upon the foot treadle 43 a cam locking mechanism is released and the eccentric will be set in motion by suitable driving means, and as the eccentric turns, the rod 10 will push the rocker arm 7 upwardly. This movement of the rocker arm will force the upper die 4 downwardly in the slide 5. As the die 4 moves toward the fixed anvil 3, it passes directly through the jaw portions of the holder and, as the surfaces which hold the stud are beveled (Figs. 6 and 8), the jaws are forced apart to allow the die 4 to "pick up" the stud part 37 and carry it toward the rivet 26. The jaws of the holder 6 are permitted to spread because the fingers 44 of the holder are pivoted upon pivots 45 in the guide 5 (Fig. 2) and are normally held against the sides of the guide by spring means 46.

The downward movement of the plunger 4 continues until the stud 37 engages over the rivet 26 and the anvil part 47 inside the end of the plunger 4 clinches the rivet against the depressed central portion of the stud as shown in Fig. 12. During the clinching operation, the table 32 is held in its depressed position as shown in Fig. 8, so that, as the plunger 4 moves upwardly, after the clinching operation, the attaching medium 42 may be withdrawn without interference from the wall 31.

A ring spring 48 (Fig. 12) is carried within the recess in the end of the die 4 and engages the neck of the stud to hold it after the stud has been "picked up" from the holder 6.

The setting die will be operated as long as the operator depresses the treadle 43, so if the operation is to be stopped after setting a fastener, the operator releases his foot from the treadle after the upper die 4 has once been set in motion.

During the first part of the down stroke of the die 4, the pivoted part 38 is swung by the cam means between the lever 39 and rocker arm 7 from the position shown in Figs. 6 and 10 to the position shown in Figs. 8 and 11, thereby permitting a stud member to drop into the groove 49, shown in dotted lines. At the same time, the sliding part 27 is moved from the position shown in Fig. 7 to the position shown in Fig. 9, so that a rivet 26 may drop into the groove 50 as illustrated. Now when the clinching operation is complete and the plunger 4 begins to move back to its normal position, the sliding part moves from the position shown in Fig. 9 to the position shown in Fig. 7, thereby moving the rivet down the chute 15 by means of the slot 50 to the anvil as shown in Fig. 7. The part 38 remains stationary until after the end of the plunger 4 has passed through the holder 6. Then the part 38 is swung from the position shown in Figs. 8 and 11 to the position shown in Figs. 10 and 6, thereby moving the stud part 37 down the chute 16 onto the holder 6 by means of the groove 49.

The machine is now ready for another setting operation.

When it is apparent to the operator that the supply in the chutes 15 and 16 is becoming exhausted, he may pull upwardly on the handle of the belt tightener 25, thereby setting all the pulleys 23 in motion to turn the tables 17 in the hoppers 13 and 14 to replenish the supply in the chutes. Thus the tables 17 remain idle except when it is desired to supply fastener parts to the chutes.

While I have shown and described a preferred embodiment of my invention, it should be understood that changes involving omission, substitution, alteration and reversal of parts and even changes in the mode of operation may be made without departing from the scope of my invention, which is best defined in the following claims:

1. In a fastener attaching machine, setting means including a movable member and a fixed member, means operable to reciprocate said movable member, a fastener holding device suspended below the setting means from which a fastener member may be picked up by the movable member, chutes for conveying fastener elements directly to the holding device and to the fixed setting member, a combined fastener feed-controlling and transfer device operable transversely to each of said chutes adjacent to their ends and having means for positive controlling movement of a fastener member from its travel in the chute past the feed-controlling and transfer device directly to the holding device and from the other chute directly to the fixed setting member.

2. In a fastener attaching machine, two opposed setting members, a chute for conveying fastener members to a predetermined point in line with the axis of the setting members, a second chute for conveying fastener members to another predetermined point in line with the axis of the setting members, a pivotally mounted combined fastener feed controlling and transferring device operable in an arc across the end of one of the chutes and having means for positive controlling movement of a fastener member from the end of a chute directly to its predetermined point in line with the axis of the setting members.

3. In a fastener attaching machine, setting means including a movable member and a fixed member, means operable to reciprocate said movable member, a fastener holding device suspended between the setting means from which a fastener member may be picked up by the movable member, a chute for conveying fastener elements directly to one of said members, a combined fastener feed-controlling and transfer device operable transversely to said chute adjacent to its end and having means for positive controlling movement of a fastener member from its travel in the chute past the feed-controlling and transfer device directly to the said member to receive the fastener member.

4. In a fastener attaching machine, setting means including a movable member and a fixed member, means operable to reciprocate said movable member, a fastener holding device suspended between said members, a chute for conveying fastener members to the device suspended between said members, a pivotally mounted combined fastener feed-controlling and transferring device operable in an arc across the end of said chute and having means for positive controlling of a fastener member from the end of said chute directly to said device, a second chute for conveying fastener members to the fixed member and a second combined fastener feed-controlling and transferring device operable across the end of the said second chute and having means for positive controlling movement of a fastener member from the end of the second chute directly to the said fixed member.

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

WALTER H. PIERCE.