

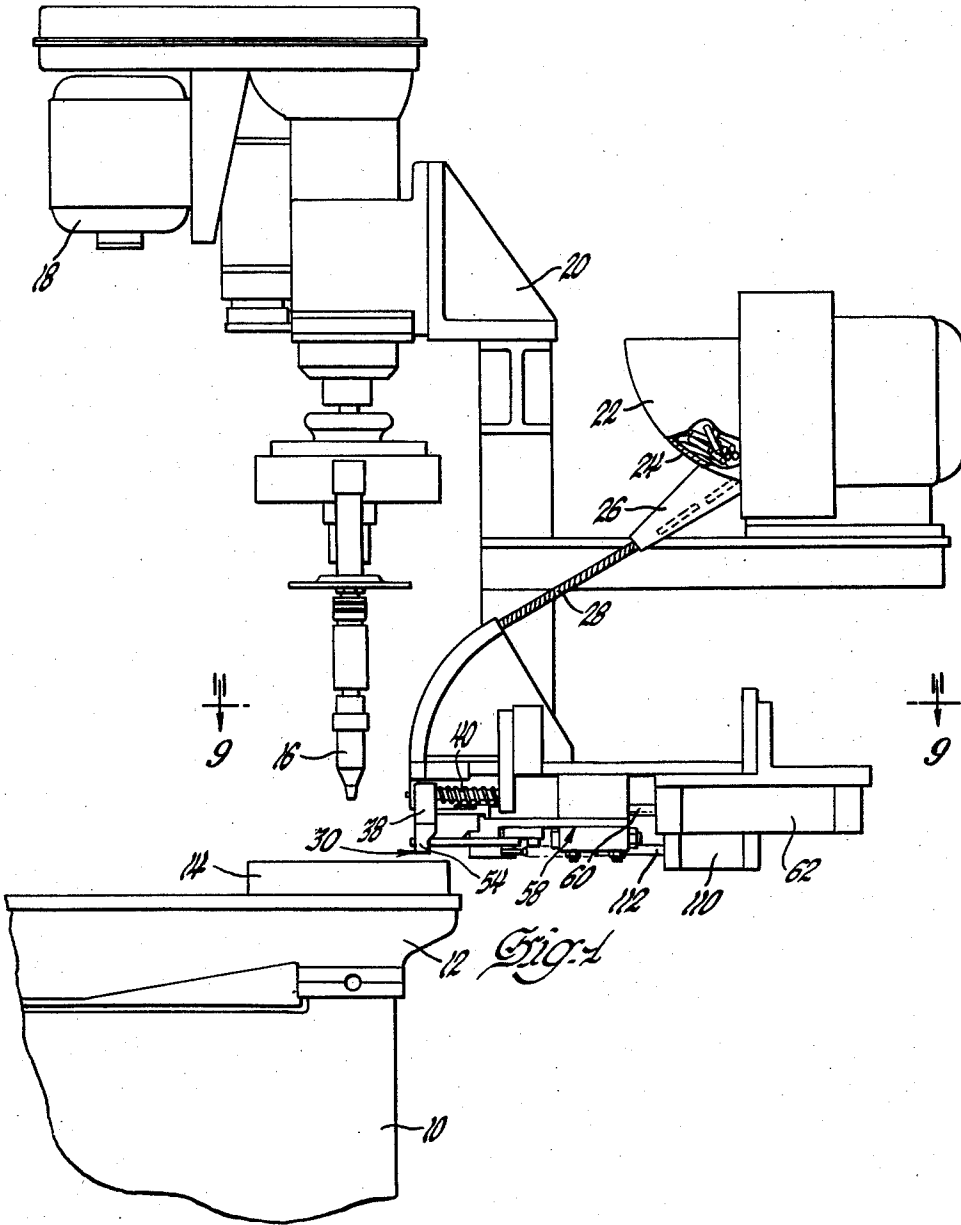
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D. N. VAN ALSTYNE
STUD TRANSFER AND HOLDING MEANS
FOR A STUD DRIVING TOOL

2,843,166

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5 Sheets-Sheet 1



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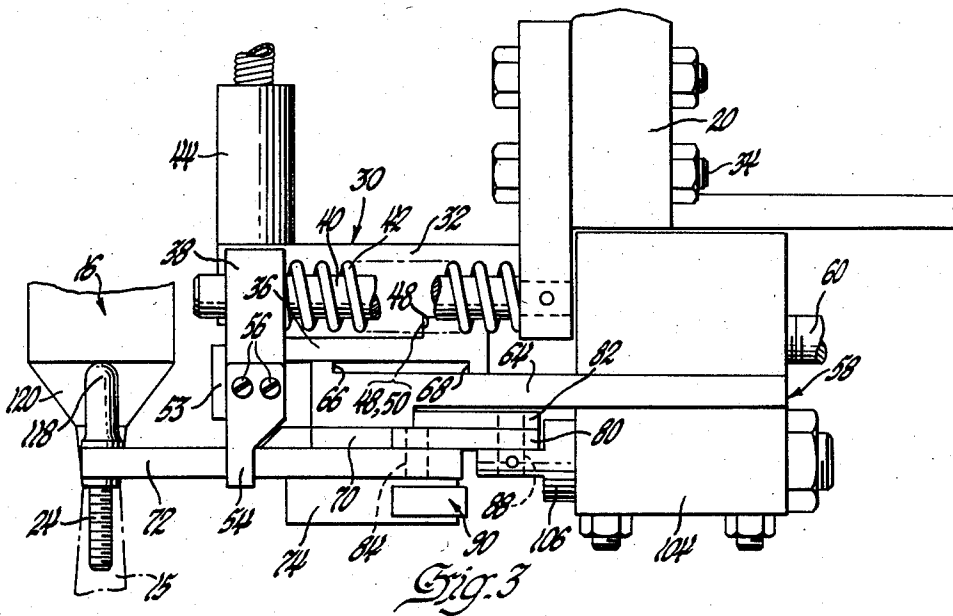
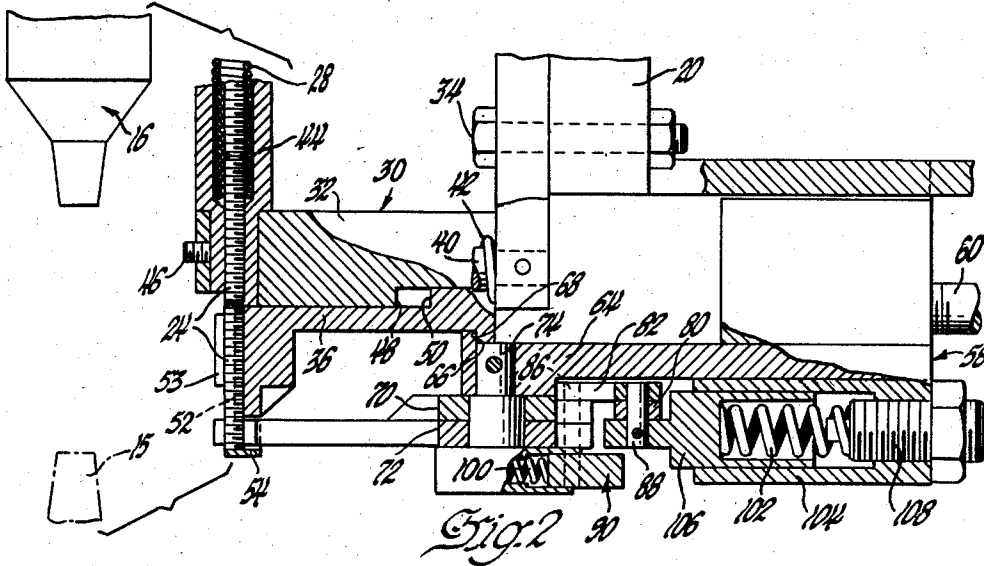
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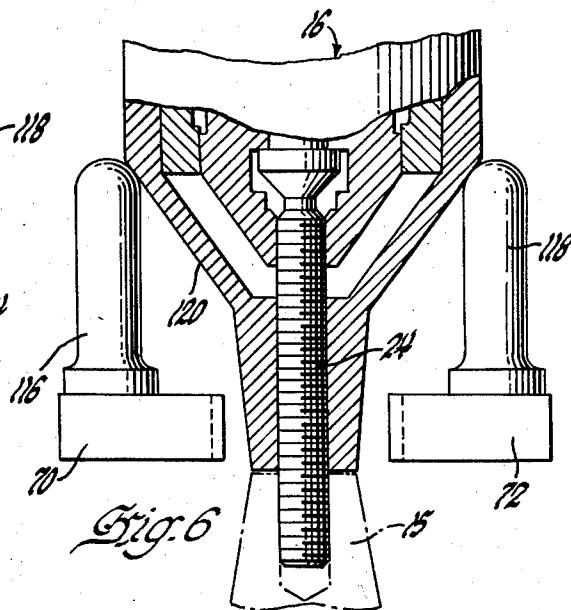
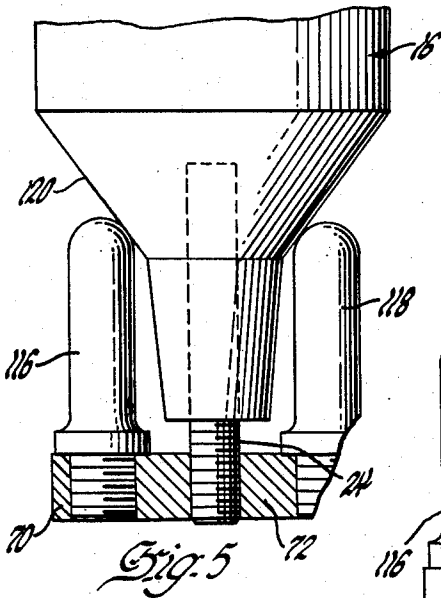
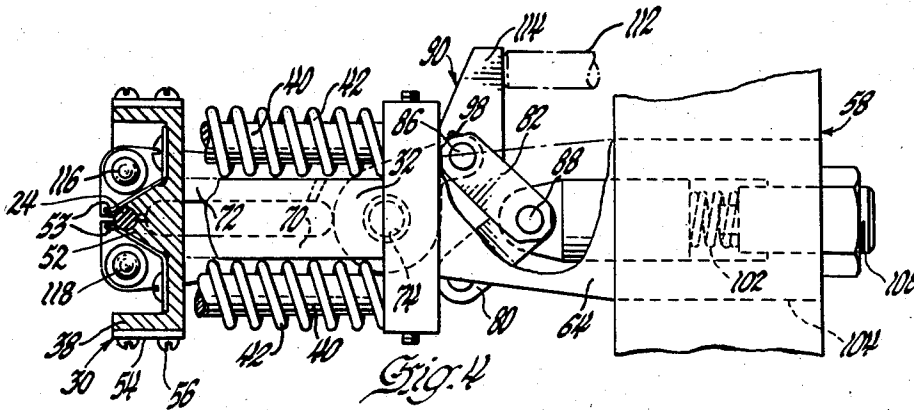
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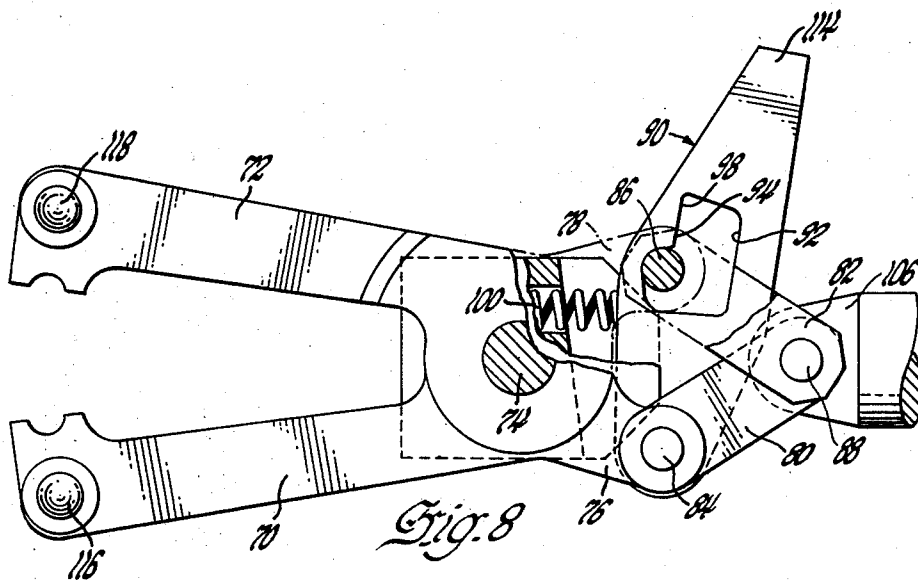
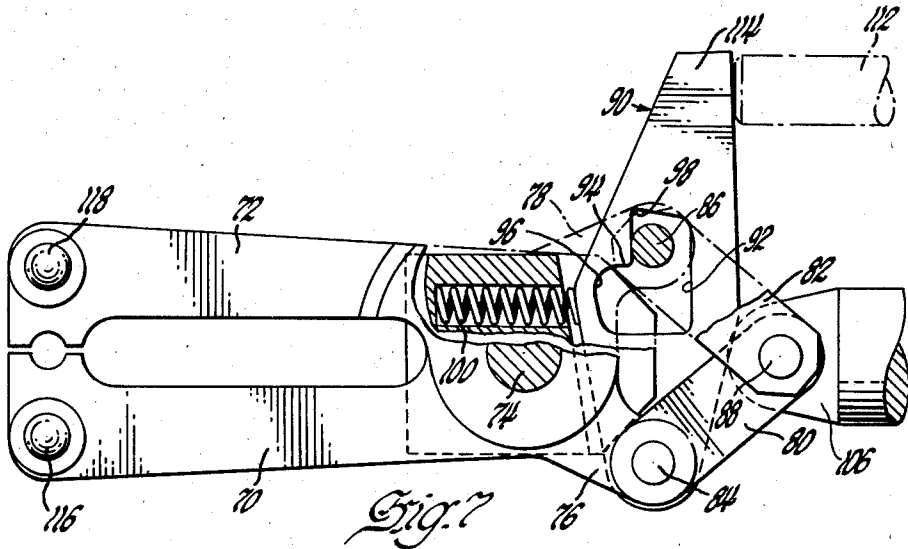
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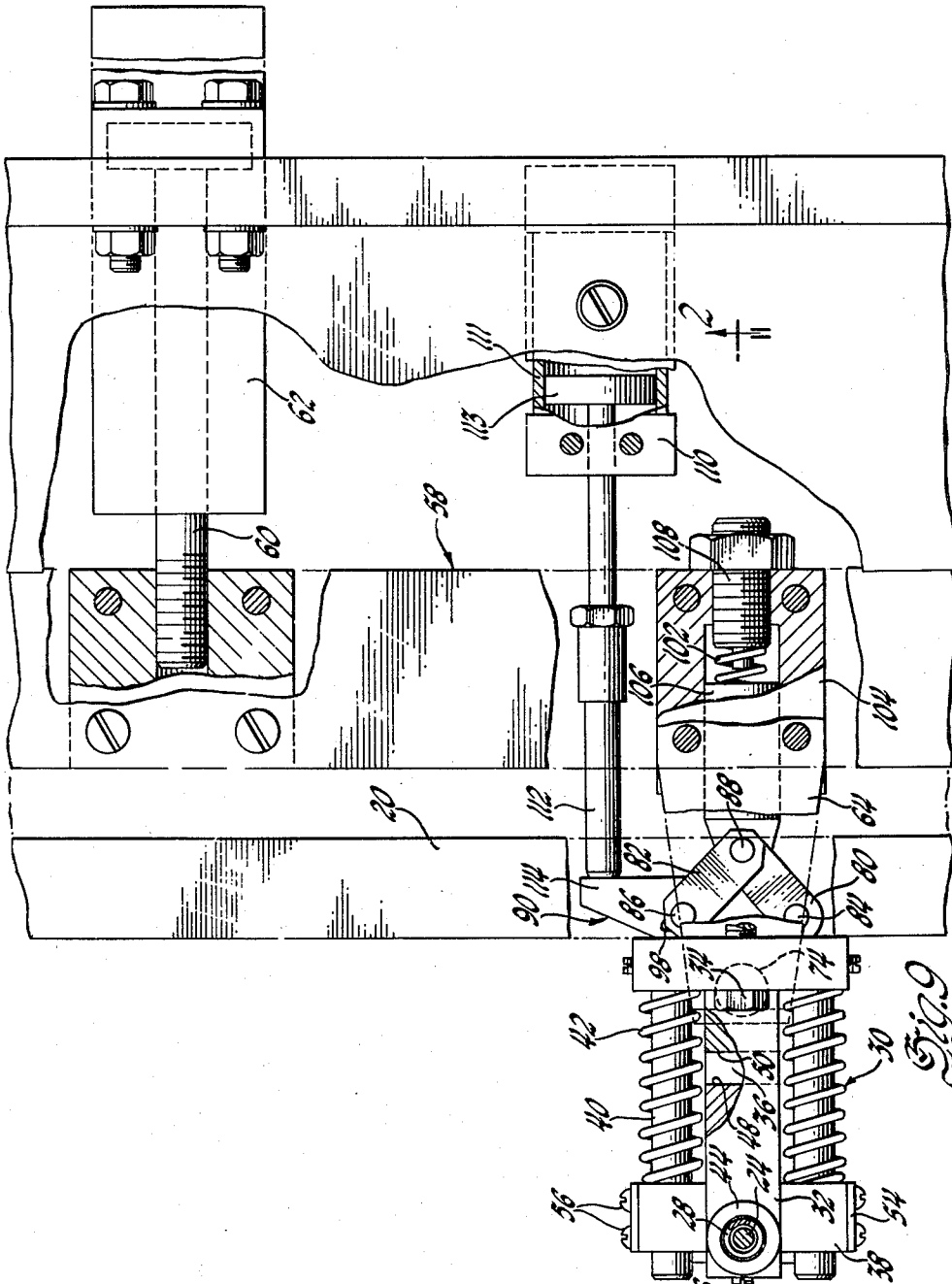
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5 Sheets-Sheet 5



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STUD TRANSFER AND HOLDING MEANS FOR A STUD DRIVING TOOL

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5 Claims. (Cl. 144—32)

This invention relates to work transfer means generally and more particularly to means for receiving, transferring and orienting workpieces relative to spaced work stations.

Workpieces required to be transferred between spaced work stations and to be centered preceding the work operation at the second work station are generally transferred by means which will deliver the workpieces to separate work centering means located at the second station.

It is here proposed to provide a work transfer and centering device including jaw members which are clamped upon a workpiece and locked in such position during their transfer operation, being released only upon the commencement of the work operation at the next succeeding work station. The proposed device is adaptable for work feeding operation and includes means for receiving a workpiece, for preventing further feed during the transfer of a workpiece, and for properly positioning the transferred workpiece at a subsequent location.

In the drawings:

Figure 1 is a diagrammatic side view of a work tool including the present invention as adapted to transfer stud members between a receiving station and a stud driving work station.

Figure 2 is a side view of the proposed work transfer means in a loading position and having parts broken away and shown in cross-section and taken in the direction of arrows 2—2 of Figure 9.

Figure 3 is a side view of the proposed work transfer means just prior to its return stroke.

Figure 4 is a top view of the proposed work transfer means at the work receiving station and having parts broken away and shown in cross-section.

Figure 5 is an enlarged end view of the work transfer jaws showing the work tool engaging the workpiece.

Figure 6 is an enlarged end view of the work transfer jaws showing the work tool spreading the work jaws in the course of acting upon the workpiece.

Figure 7 is an enlarged top view of the work transfer jaws shown in a closed position.

Figure 8 is an enlarged top view of the work transfer jaws shown in an open position.

Figure 9 is a plan view of the work transfer means taken in the direction of arrows 9—9 of Figure 1 and having parts broken away and in section.

The proposed transfer means is here shown as adapted for feeding threaded studs to a stud driving work tool.

The stud driving work tool includes a base 10, worktable 12, and work bed 14 upon which work members including stud receiving bosses 15 are manually or otherwise placed. A stud driver 16, operated by drive means 18, is mounted upon a support member 20 and is disposed directly over the work bed 14.

A workpiece hopper 22 is mounted upon the support member 20 and receives workpieces 24 which are axially aligned and fed through feed chute 26 and a flexible conduit 28 to the transfer means 30.

The transfer means 30 includes a locating bracket 32

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secured to the support member 20 by fastening means 34 and extended horizontally towards the stud driver 16.

A workpiece feed cutoff slide member 36 including dog ears 38 is slidably mounted by means of the dog ears beneath the locating bracket 32 upon guide rods 40 secured to the locating bracket. The cutoff slide is biased by spring means 42 to normally close feed passage member 44 secured within the end of the locating bracket 32 by set screw means 46. Shoulders 48 and 50 are provided on the locating bracket 32 and cutoff slide 36, respectively, to limit the travel of the feed cutoff slide 36. The front end of slide member 36 is formed to receive a workpiece 24 within forwardly extending tabs 52 and retainer spring clips 53, and upon a stud stop bracket 54, secured thereto by fastening means 56, when the slide is in a retracted position.

A slide carriage 58 is connected to the end of a rod 60 extended from and actuated by a fluid control cylinder means 62, secured to the support member 20, and includes a support bracket 64 having a shoulder 66 for engaging a shoulder 68 of the feed cutoff slide 36 to return the cutoff slide to a retracted position, against the biasing force of springs 42, or to release the slide member to effect a closure of the feed passage member 44. The slide carriage also includes the work transfer jaws or fingers 70 and 72 pivotally secured thereto upon the pivot post 74.

The work transfer jaws 70 and 72 are connected together like scissor blades upon pivot post 74 and include control lugs 76 and 78, respectively, having links 80 and 82, respectively, pivotally attached thereto and to each other upon pivot pins 84, 86 and 88. A latch segment 90 is also pivotally mounted upon pivot pin 84 and includes a latch opening 92 through which pivot pin 86 extends. The latch opening includes a cam surface 94 for separating latch and unlatching recesses 96 and 98 within which pin 86 is received and held in the course of holding the work jaws in open or closed positions. Spring means 100 provided within the base of pivot post 74 normally biases the latch segment 90 against the pivot pin 86 while spring means 102 within plunger block 104, secured to slide bracket 64, biases a plunger 106, engaging pin 88, to urge link 82 to actuate or bias pivot pin 86 within one of the latch recesses 96 or 98. A threaded plug 108, received within the end of plunger block 104, permits the adjustment of spring 102 to the required biasing force relative to spring 100.

The latch segment 90 is moved about its pivot pin 84 by having a triggered mechanism 110 actuate a plunger 112 operatively connected thereto to engage the extended end 114 of the latch segment, and to act thereon to pivot the latch against the biasing force of spring 100, and cause spring 102 to urge lugs 76 and 78 apart, by means of links 80 and 82, closing the work jaws and disposing pin 86 within recess 98 where it is biased and the work jaws are held closed. Mechanism 110 may be a fluid actuated motor including a cylinder 111 and a piston 113 to which plunger 112 is attached and by which it is operated.

The work jaws 70 and 72 are opened by means acting upon the jaw members themselves rather than the latch segment 90 as follows: At the ends of the work jaws 70 and 72 are provided upright pins, 116 and 118 respectively, which are adapted to be engaged by the tapered shoulder 120 of the stud driver 16 in the course of receiving the workpiece. The pins 116 and 118 are forced apart, spreading jaws 70 and 72 and causing pin 86 to ride over the cam surface 94 of the latching segment to within recess 96 where it is held by spring 102 to keep the jaws in their open position until the latch segment 90 is again tripped by plunger 112.

The cycle of operation of the proposed transfer means is generally as follows: Threaded workpiece studs 24 are

received from hopper 22, through conduit 28 to within the feed passage member 44. In the retracted position of the slide carriage 58, shoulder 66 thereof engages shoulder 68 of the feed cutoff slide 36 holding back the cutoff slide and permitting a workpiece to be received upon bracket 54 between the transfer jaws 70 and 72 which are held open by latch segment 90.

To initiate the transfer or feed cycle the trigger mechanism 110 is actuated to cause plunger 112 to be extended from cylinder 111 to trip latch segment 90, closing the work jaws 70 and 72 upon the workpiece 24. Figure 9 shows the mechanism in this position. The latch segment 90 operates to keep the jaws closed upon the workpiece while cylinder means 62 moves the slide carriage 58 towards the stud driver 16 and to a position disposed axially therebeneath and centrally over the stud receiving boss 15 of the workpiece receiving member. This travel is determined by the distance through which the slide carriage 58 is permitted to travel before engaging the end of the locating bracket 32, as shown in Figure 3.

As the slide carriage 58 is moved forward by cylinder means 62, the cutoff slide 36 is released from contact with shoulder 66 thereof and is moved by spring means 42 to close the feed passage member 44 and prevent other workpieces from being fed to the transfer means 30.

With the workpiece disposed in position and held and centered within the work jaws 70 and 72, as seen in Figures 3-5, the stud driver is actuated to commence driving the stud within the workpiece receiving member, whereupon the tapered shoulder 120 thereof engages the pins 116 and 118 forcing the jaws apart and causing pivot pin 86 to fall into recess 96 of the latching segment 90 to hold the jaws open during the return stroke.

As the slide carriage 58 returns shoulder 66 engages shoulder 68 of the cutoff slide, moving the latter to its retracted position and permitting another workpiece to pass from the feed passage member to between the work transfer jaw members.

The claims:

1. Work transfer means including a reciprocal carriage member operable between spaced work stations, said carriage member including jaw members pivotally connected together intermediate their ends and having actuating pins connected to the ends thereof, means engaging said actuating pins at one end of said jaw members for urging said jaw members to a closed position, means engaging said actuating pins at the other end of said jaw members for urging said jaw members to an open position, and means engaged with said jaw members for sustaining said open or closed positions during the transfer of said carriage between said spaced work stations.

2. Work transfer means to for use with a work tool spaced apart from a work feeding station and which includes, feed cutoff means disposed at said work feeding station, carriage means reciprocal between said feeding station and said work tool and including means for controlling said feed cutoff means, work transfer jaws pivotally mounted upon said carriage member and including means normally biasing said jaws together, latch means for holding said jaws apart, means at said work feeding station for releasing said latch to close said jaws upon a workpiece to be transferred, and means provided upon said work tool for spreading said jaws apart in the course of working upon said workpiece and until held by said latch means.

3. Workpiece feed means which include a workpiece receiving member, feed cutoff means slidably mounted beneath said receiving member and normally biased to close said receiving member, carriage means reciprocal between said receiving member and a work tool spaced apart therefrom, said carriage means engaging said feed cutoff means to retract said cutoff means and permit workpiece feed to said carriage member, said carriage member including workpiece engaging jaw members pivotally secured together and means normally biasing said jaw members in a closed position, pivotal latch means engaging said jaw members for holding said jaw members open and biased to act when said jaw members are opened, and means provided upon said jaw members for engagement by said work tool to spread said jaw members apart in the course of working upon said workpiece.

4. Work transfer means including a reciprocal carriage member operable between spaced work stations, said carriage member including jaw members pivotally connected together and biased for engagement, latch means pivotally connected to one of said jaw members and biased to engage the other of said jaw members, said latch means including a recess for holding said jaw members apart, means for feeding workpieces to said carriage member at one of said work stations, means for receiving and working on said workpieces at the other of said work stations, means at said one work station for releasing said latch to permit said jaw members to close about a workpiece and means at said other work station for spreading said jaw members apart until held open by said latch means.

5. Work transfer means for use with a work tool and which includes workpiece feeding means, feed cutoff means slidably mounted beneath said feeding means, a carriage member slidably mounted beneath said feed cutoff means and including a pair of work jaw members pivotally secured together intermediate their ends, means controlling the reciprocal travel of said carriage member, said carriage member including means for retracting said feed cutoff means from a normally biased position closing said feeding means and means for receiving workpieces between said jaw members for transfer, means biasing said jaw members in a normally closed position, latch means preventing closure of said jaw members, and means controlling the disposition of said jaw members which includes upright pins provided near the ends of said jaw members for engagement by said work tool to spread said jaw members until said latch means prevents the closure thereof and separate means engaging said latch means to release said jaw members preceding the subsequent work transfer operation.

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