Sept. 6, 1932. J. C. HANNA 1,875,448

RIVETER CONSTRUCTION

Filed March 8, 1928 2 Sheets-Sheet 1

Fig. 1

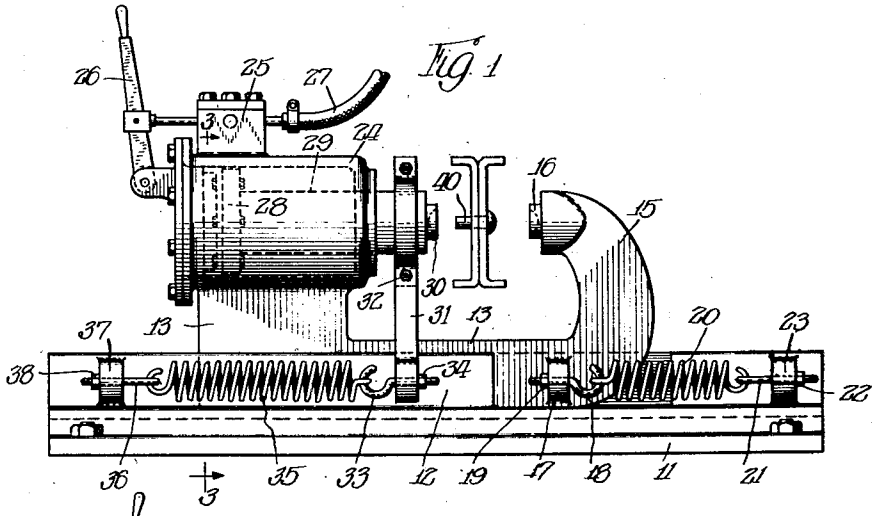


Fig. 2.

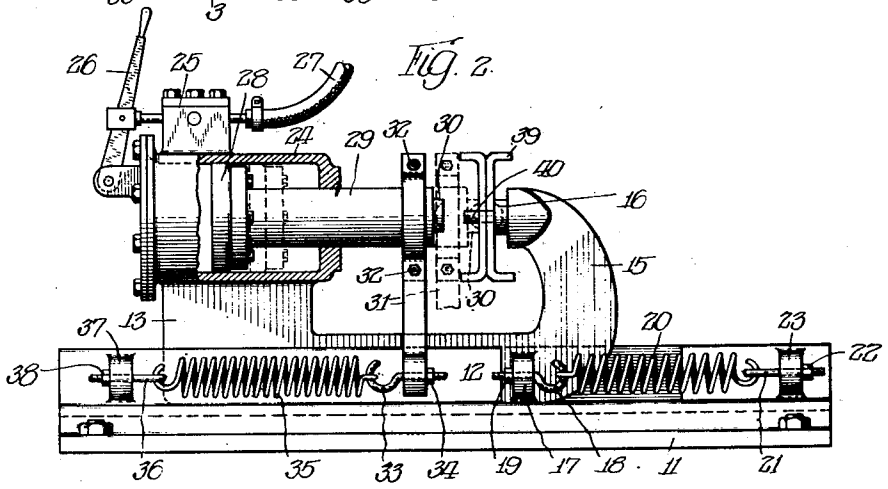
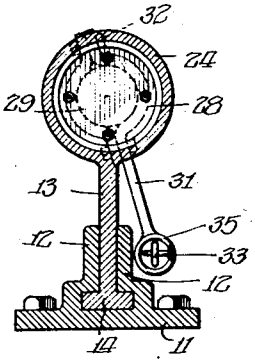


Fig. 3.



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Sept. 6, 1932. J. C. HANNA 1,875,448

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Filed March 8, 1928 2 Sheets-Sheet 2

Fig. 4

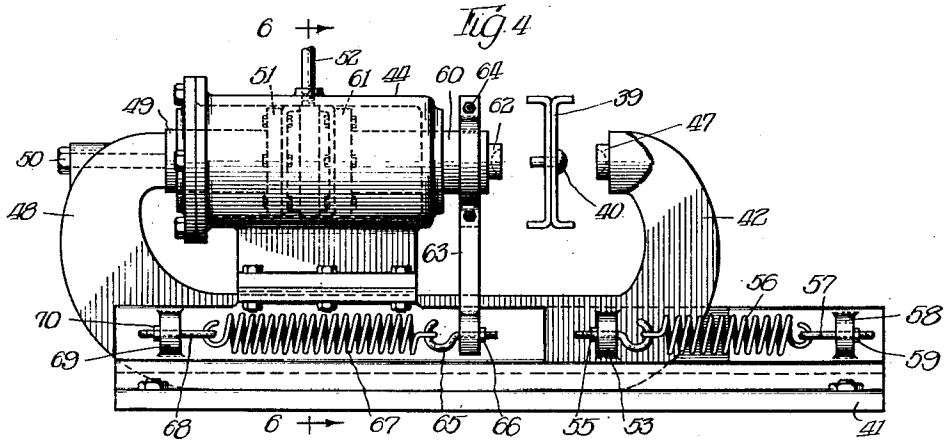


Fig. 5.

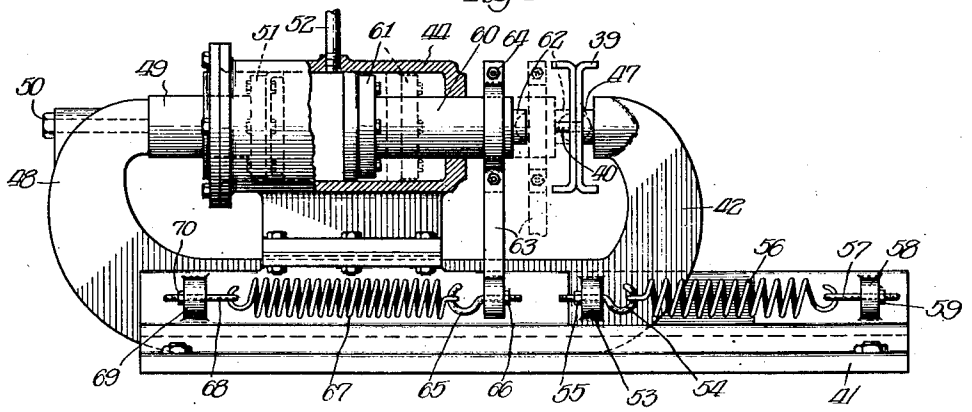
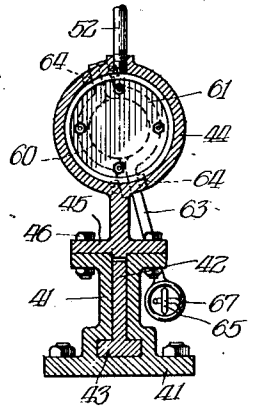


Fig. 6



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UNITED STATES PATENT OFFICE

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RIVETER CONSTRUCTION

Application filed March 8, 1928. Serial No. 260,068.

This invention relates to a new and improved riveter construction, and more particularly to a construction adapted to be used upon work which is fixed in position relative to the riveter.

In riveting operations it is necessary as a preliminary step to bring the dead die of the riveter into engagement with the preformed rivet head before the live die engages the other end of the rivet to perform the riveting operation. In certain types of work this is accomplished with a fixed riveter by placing the work and preformed rivet head upon the dead die, the live die being then operated to bear upon the rivet and perform the forming operation. In certain classes of work it is undesirable, from a manufacturing standpoint, either to move the riveter to bring the dead die into engagement with the formed rivet head or to move the work to place the rivet upon the die. As an example of such cases, reference may be had to work such as forming chassis frames where a plurality of riveters may be used at one time on the work. In such cases it is necessary to cause a preliminary movement of the dead die of each riveter to bring it into engagement with the rivet before the forming operation can take place.

It is an object of the present invention to provide a riveter construction wherein the riveter may be carried upon a fixed support and a preliminary movement given to the dead die to bring it into engagement with the work which may be fixed relative to the riveter support.

It is an additional object to provide a construction of this character in which the movements of the dead and live dies are accomplished by a single operating cylinder.

It is a further object to provide a construction in which the order of movement of the dead and live dies is accomplished automatically by yielding resistances associated with the dies, these resistances varying in effect.

It is an additional object to provide a construction which is simple in design and operation, and adapted for commercial production and use.

Other and further objects will appear as the description proceeds.

I have illustrated certain preferred forms of my invention in the accompanying drawings, in which—

Figure 1 is a side view of one form of construction with the dies in normal position;

Figure 2 is a view similar to Figure 1 but with parts broken away and with the dead die in contact with the work;

Figure 3 is a fragmentary section taken on line 3—3 of Figure 1;

Figure 4 is a view similar to Figure 1 showing a modified form of construction;

Figure 5 is a view of the construction shown in Figure 4 with the dead die in engagement with the work; and

Figure 6 is a section taken on line 6—6 of Figure 4.

Referring first to the form of construction shown in Figures 1 to 3, the supporting frame 11 is provided with upwardly extending guide members 12 between which is fitted the riveter frame 13 having the bottom flange 14, which retains it in the guideway. One end of the frame 13 extends upwardly at 15 and carries the dead die 16. The frame 13 is provided with the laterally extending lug 17 and a section of one of the flanges 12 is cut away to permit movement of this lug. The lug 17 carries the hook 18 adjustably secured thereto by means of the nut 19. The hook 18 has connected thereto the coil spring 20, the other end of which is connected to the hook 21, secured by nut 22 in the lug 23 extending from one end of one of the flanges 12.

The riveter frame 13 also carries the cylinder 24, this cylinder being provided with the slide valve housing 25 in which a slide valve is operated by means of the valve handle 26. A flexible connection 27 is provided for the introduction of fluid under pressure for operating the cylinder. The cylinder 24 carries the piston 28 to which is connected the ram 29 carrying the live die 30. The arm 31 is clamped to the ram 29 by means of bolts 32 and the lower end of this arm has the hook 33 adjustably secured therein by means of the nut 34. This hook 33 is connected to the coil spring 35, the other end of which is connected

to hook 36 adjustably secured to the lug 37 by means of nut 38. The work has been shown as a pair of channel irons 39 carrying a rivet 40.

The form of construction shown in Figures 4 to 6 comprises a supporting frame 41 which has a trackway receiving the dead die arm 42 which has the horizontal flange 43 fitting in the trackway. The cylinder 44 is provided with the flange 45 which is clamped to the top of the frame 41 by means of bolts 46. The dead die arm 42 carries the dead die 47 and at the other end it is provided with the upwardly extending portion 48 to which the ram 49 is connected. The ram is also connected to the piston 51, located in the cylinder 44. Power is supplied to the cylinder 44 through pipe 52. The dead die arm 42 is provided with lug 53 which has the hook 54 adjustably secured therein by means of nut 55. This hook 54 is connected to the spring 56, the other end of which is connected to the hook 57, adjustably held in lug 58 by nut 59. The lug 58 extends from the supporting frame 41. The ram 61 is fitted into the opposite end of the cylinder 44 to the arm 49 and carries the piston 51. This ram 60 also carries the live die 62. The arm 63 is secured to the ram 60 by bolts 64. The lower end of this arm 63 has the hook 65 adjustably secured therein by nut 66. The hook 65 is connected to spring 67, the opposite end of which connects to hook 68 adjustably secured in lug 69 by nut 70. In these figures the work has also been indicated as a pair of channel irons 39 carrying the rivet 40.

In the operation of the form of construction shown in Figures 1 to 3, the work to be operated upon will be placed in the position shown in Figures 1 and 2, with the rivet 40 having its head toward the dead die 16. The slide valve handle 26 is swung to the right, as shown in Figure 2, which admits fluid under pressure to the cylinder 24. This fluid under pressure acts both against the end of the cylinder and the piston 28. Since the spring 20 is made materially weaker than the spring 35, the ram 29 and piston 28 will be held against movement by the spring 35 during the first portion of the operation. The fluid under pressure will thus cause the cylinder to move to the left, as seen in the drawings, carrying with it the frame 13 and the dead die 16 until that die contacts with the formed head of the rivet 40. This prevents further movement of the dead die, and the continued introduction of fluid under pressure causes the piston 28 and ram 29 to move to the right to the broken line position of Figure 2. The spring 35 gives to permit this movement. The movement continues until the rivet is formed and the live die brings up against the work. Upon the completion of the riveting operation the valve handle 26 is moved to permit escape of the fluid under pressure in the cylinder and the springs 35 and 20 return the parts to normal position, as seen in Figure 1.

In the form of construction shown in Figures 4 to 6, the work is positioned as shown in Figure 4, and fluid under pressure is admitted to the cylinder through pipe 52. It will be seen that this fluid is admitted between two pistons 51 and 61. The spring 56 is lighter than the spring 67 and the first movement causes the ram 49 to move to the left and this, through the connecting frame 48 and arm 42, moves the dead die 47 to bring it into engagement with the formed head of the rivet. This engagement stops further movement of the piston 51 and the continued introduction of fluid under pressure in the cylinder causes the piston 61 and ram 60 to move to the right, bringing the live die 62 against the unformed end of the rivet. After the completion of the forming operation, the fluid under pressure in the cylinder is released and the springs 56 and 67 restore the parts to normal position, as shown in Figure 4.

While I have shown certain preferred forms of my invention by way of example, it is capable of further modification to meet varying conditions, and I contemplate such changes and modifications as come within the spirit and scope of the appended claims.

I claim:

1. In a riveter construction, a supporting frame, a riveter mounted upon the supporting frame, a dead die and a live die, both said dies being independently movable relative to the supporting frame, and yieldable means connecting each die and the frame and positioning the dies relative to the supporting frame, the yieldable means connected to the dead die having less resistance than that connected to the live die whereby in actuation of the dies the dead die will position itself relative to the work prior to the live die.

2. In a riveter construction, a supporting frame, a riveter mounted upon the supporting frame, a dead die and a live die, both said dies being independently movable relative to the supporting frame, and separate coil springs connecting the live and dead dies to the supporting frame and positioning them relative to the frame, the spring connected to the live die being of greater resistance than that connected to the dead die whereby in actuation of the dies the dead die will position itself relative to the work prior to the live die.

Signed at Chicago, Illinois, this 3d day of March, 1928.

JOHN C. HANNA.