Dec. 28, 1926. 1,611,876

F. P. BERGER

RIVETING MACHINE

Filed Feb. 9, 1925 2 Sheets-Sheet 1

Fig. 3

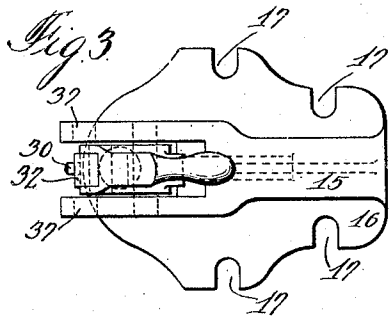


Fig. 6

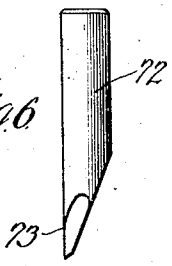


Fig. 2.

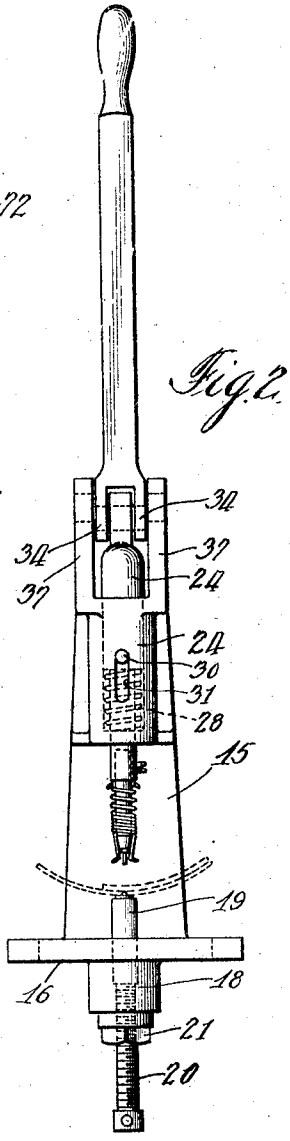


Fig. 4

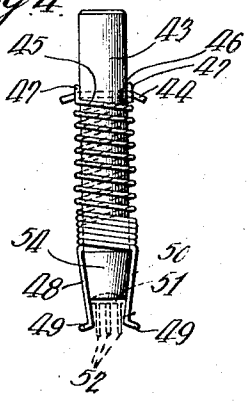


Fig. 5

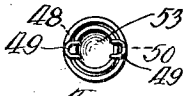
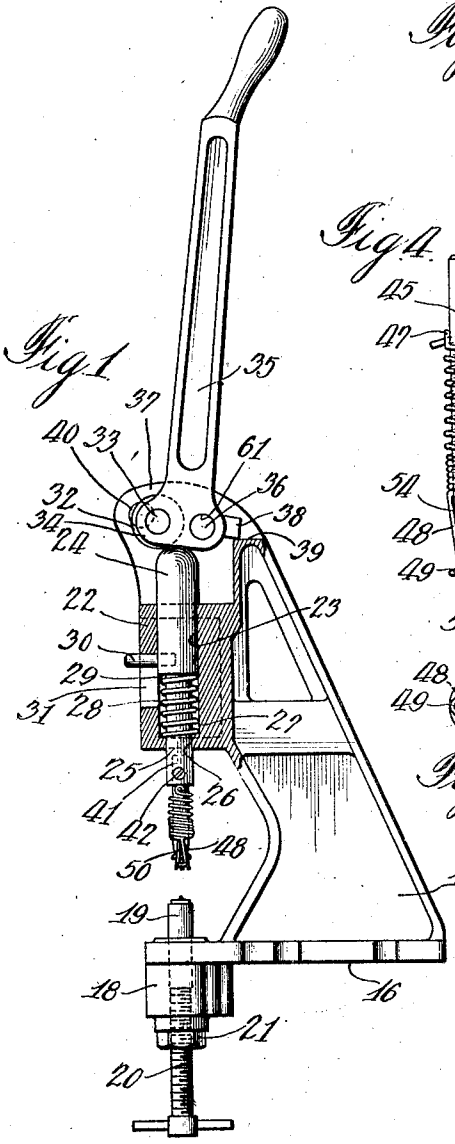


Fig. 1



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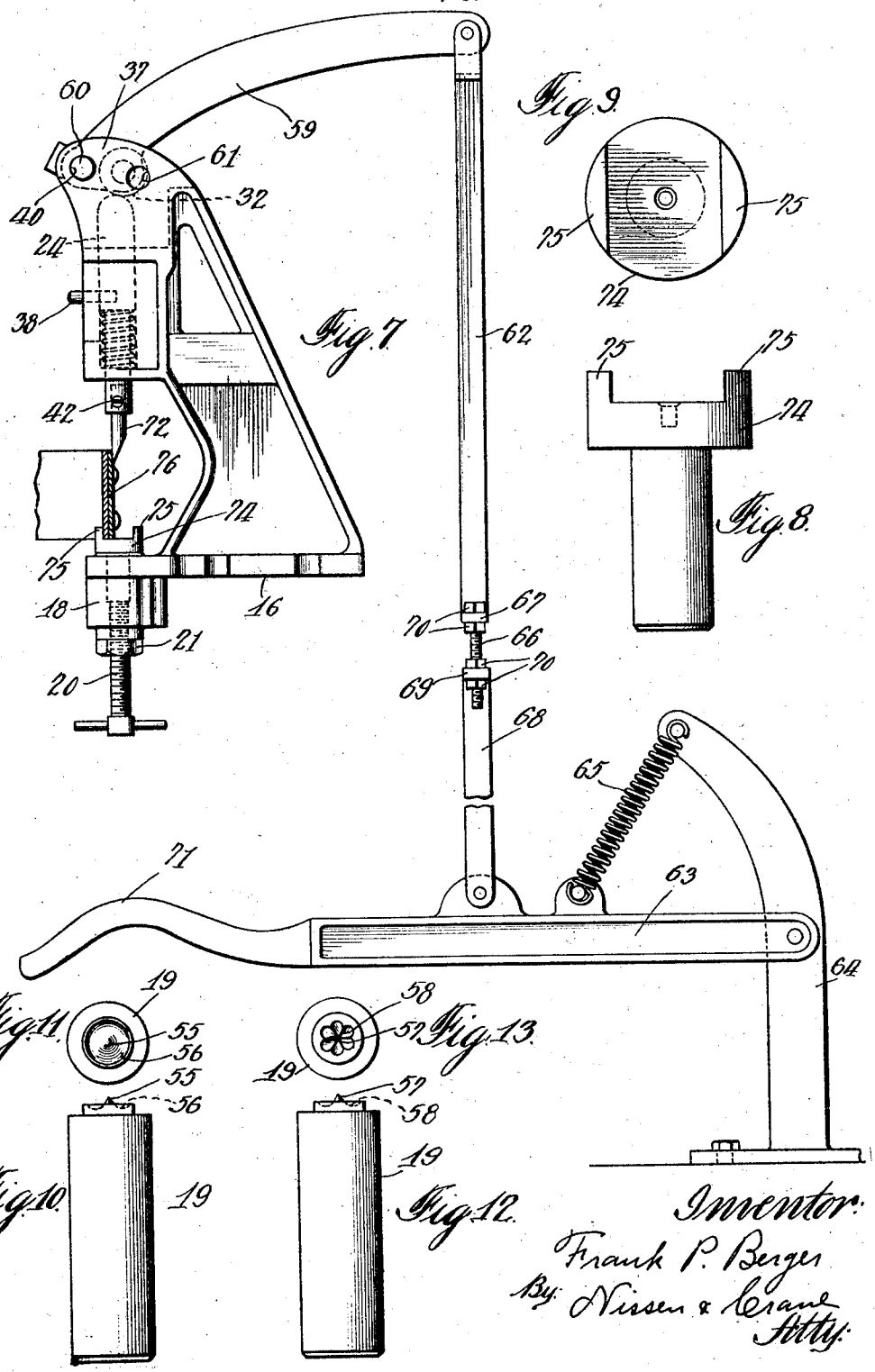


Fig. 7

Fig. 9

Fig. 8

Fig. 11

Fig. 13

Fig. 10

Fig. 12

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UNITED STATES PATENT OFFICE.

FRANK P. BERGER, OF CHICAGO, ILLINOIS, ASSIGNOR TO BERGER DEVICE MFG. CO., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

RIVETING MACHINE.

Application filed February 9, 1925. Serial No. 7,735.

This invention relates to machines for inserting and fastening rivets into various articles to be secured, and especially to machines for riveting linings in brake bands.

The invention has for its object the provision of a machine which is readily adapted to rivets of different kinds, which may be used for removing old rivets, which may readily be provided with either hand or foot operating mechanism, and which shall be simple, economical, and of improved construction and operation.

The invention is exemplified in the combination and arrangement of parts shown in the accompanying drawings and described in the following specification, and it is more particularly pointed out in the appended claims.

In the drawings—

Fig. 1 is an elevation, with parts in section, showing one embodiment of the present invention;

Fig. 2 is a front elevation of the device shown in Fig. 1;

Fig. 3 is a top plan view of the device shown in Fig. 1;

Fig. 4 is an elevation of one form of rivet holder provided for use in connection with the invention;

Fig. 5 is a bottom plan view of the holder shown in Fig. 4;

Fig. 6 is an elevation of a chisel bit which may be used in connection with the present invention;

Fig. 7 is an elevation showing the invention provided with a foot operating lever;

Fig. 8 is an elevation of an anvil which may be used in connection with the chisel bit shown in Fig. 6;

Fig. 9 is a top plan view of the anvil shown in Fig. 8;

Fig. 10 is one form of rivet clinching anvil;

Fig. 11 is a top plan view of the anvil shown in Fig. 10;

Fig. 12 is a different form of anvil; and

Fig. 13 is a top plan view of the anvil shown in Fig. 12.

Referring first to Figs. 1, 2 and 3, the numeral 15 designates a frame or standard having a base 16 provided with openings 17 by means of which the standard may be bolted or screwed to the upper face of a suitable table. The base 16 preferably extends forwardly beyond the edge of the table and is provided with a socket member 18 for receiving a work supporting anvil 19. A screw 20 is threaded into the lower portion of the socket member 18 and is provided with a lock nut 21 for holding it in adjusted position. By means of the screw 20 the anvil 19 may be vertically adjusted to bring its upper end to different heights. The upper end of the pedestal 15 is provided with a guide sleeve 22 having a cylindrical opening 23 therein in which a plunger 24 is slidably mounted. The lower end of the plunger 24 is provided with a reduced portion 25 which fits a reduced portion 26 of the slideway 23. This construction provides a shoulder 27 which supports a spring 28 surrounding the reduced portion 25 and supporting the plunger 24 by engaging the cylindrical shoulder 29 at the upper end of the reduced portion 25. A pin 30 is inserted in the plunger 24 and travels in a slot 31 formed in the wall of the sleeve 22. This pin 30 limits the extent of travel of the plunger 24 and at the same time holds the plunger from rotation. The upper end of the plunger 24 is preferably rounded and engages a roller 32 journaled on a pin 33 between bifurcations 34 formed at the lower end of a hand lever 35. The lever 35 is pivotally mounted on a pin 36 supported by spaced ears 37 at the upper end of the pedestal 15. The lever 35 is provided with a rearwardly projecting lug 38 in position to strike a stop shoulder 39 on the pedestal 15 and limit the rearward movement of the handle 35 so that the handle will always be in position to be readily grasped by the operator. The ears 37 are preferably provided with two sets of openings for pivot pins, one set being in registration with the pin 36 shown in Fig 1 and the other set being formed at 40 near the front portion of the ears. The object of this double set of pivot pin openings will appear later.

The lower end of the plunger 24 is provided with a socket 41 for receiving various forms of operating bits or rivet holders. A set screw 42 is provided for retaining the operating tools in position in the plunger 24. The form of rivet holders shown in Figs. 4 and 5 comprises a shank 43 having a pin 44 extending therethrough and projecting at diametrically opposite points. A pair of helical springs 45 and 46 surround the lower end of the shank 44 and each spring is provided at its upper end with a

loop 47 which engage opposite ends of the pin 44. The lower ends of the helical springs 45 and 46 extend downwardly, as shown at 48, and are bent at their lower ends to form loops 49. The extreme ends of the springs are bent inwardly, as shown at 50, so as to provide spaced portions illustrated in Fig. 1 for engaging at four spaced-apart points the head 51 of a rivet having penetrating portions 52. It will be seen that this form of rivet holder provides four contacting fingers arranged in spaced relation to one another so that the rivet will be firmly held.

The shank 43 is provided with a depression 53 at its lower end which fits the top of the rivet head 51. It will be noted that the fingers 50 extend inwardly to conform to the tapered portion 54 at the lower end of the shank 43. When the rivet holder is forced downwardly by forward movement of the hand lever 34 the loops 49 will strike the upper face of the material to be riveted shortly after the points 52 have begun to penetrate the material. Further downward movement will compress the springs 45 and 46 forcing the fingers 50 upwardly and at the same time spreading them outwardly by means of the tapered portion 54 of the shank. This will free the rivet from the holding fingers at the same time that the rivet is inserted in the material. Where split rivets such as that illustrated in Fig. 4 are used, an anvil similar to that shown in Figs. 10 and 11 is employed. This anvil is provided with a central raised portion 55 having surrounding curved surfaces 56 for bending the points 52 outwardly and backwardly to clinch the rivet. Where a hollow cylindrical rivet is used the central point 57 is preferably serrated to provide cutting edges illustrated at 58 in Fig. 9. These edges divide the walls of the rivet into separate portions which are curved outwardly and backwardly to clinch the rivet.

In some cases it may be desirable to operate the riveting machine by means of foot power rather than by a hand lever. Mechanism is provided for this mode of operation, as illustrated in Fig. 7. Where this form of operation is employed a rearwardly extending lever 59 is provided to take the place of the hand lever 35. This lever is pivoted on a pin 60 extending through the openings 40 instead of the openings 61 at the rear portion of the ears 37 which are employed for the hand lever pivot 36. In the foot-operated mechanism the roller 32 is pivoted in the rear portion of the lever 59 instead of the front portion as in the case of the lever 35. A link 62 extends downwardly from the rear end of the lever 59 and passes through the supporting table to a foot lever 63 pivoted on a post 64 secured to the floor beneath the supporting table. A spring 65 normally holds the foot lever in its uppermost position and an adjusting screw 66 is provided to regulate the length of the link 62 to accommodate the foot lever to the particular height of table upon which the riveting machine is mounted. The link 62 is provided with an offset ear 67 for receiving the upper end of the screw 66 while the supplemental link 68 is provided with an ear 69 for receiving the lower end of the screw 66. Lock nuts 70 hold the screw 66 in its adjusted positions to regulate the length of the connection between the foot lever 63 and the operating lever 59. A tread portion 71 is provided at the forward end of the lever 63 in position to be easily accessible to the operator's foot.

In many kinds of work and notably in the repair of brake bands it is necessary to remove the old rivets prior to replacing the defective parts. For this purpose a chisel bit 72 is provided, as shown in Figs. 6 and 7. This bit is placed in the socket 41 and held against rotation by means of the set screw 42. The pin 30 holds the plunger 24 from rotating so that the flat face 73 of the bit 72 may be held in fixed position to engage the flat face of the work. For supporting the work during the removal of the rivets, an anvil 74 is provided which carries upwardly projecting lugs 75 to hold the work illustrated at 76 in Fig. 7 from moving forwardly away from the chisel bit 72. By this arrangement the work is easily held in place and the rivet heads can be readily sheared from the old work to permit the replacement of the defective parts or brake band linings.

I claim:—

1. A riveting machine comprising a pedestal having a cylindrical guide opening therein, said opening having a reduced portion at its lower end, a plunger mounted in said guide opening and having a reduced lower portion for registering with the reduced portion of said opening, a spring surrounding the reduced portion of said plunger within said guide opening, a pin projecting radially from said plunger through a slot in the wall of said guide opening for limiting the longitudinal movement of said plunger and preventing rotation thereof, a lever for actuating said plunger against the resistance of said spring, said lever having a cam roller engaging the upper end of said plunger, and means for securing an operating tool to the lower end of said plunger.

2. A riveting machine comprising a plunger having a rivet setting tool provided with a shank, and means for holding a rivet on said shank, said means comprising helical springs surrounding said shank and having projections projecting beyond the end

thereof for engaging a rivet, said springs permitting the projecting portions to be moved backwardly toward said shank to free said rivet.

3. A riveting machine comprising a rivet engaging shank, and a pair of helical springs surrounding said shank and secured thereto at spaced positions thereon, portions of said springs projecting beyond said shank to provide rivet engaging fingers for holding a rivet to said shank.

4. A riveting machine comprising a shank, a spring finger secured to said shank, said finger comprising an elongated portion bent backwardly upon itself adjacent the end of said shank to provide spaced contact members for engaging a rivet, and means to cooperate with said finger to grasp a rivet.

5. A riveting machine comprising a shank having a pair of helical springs thereon, said springs having portions extended beyond the end of said shank and bent backwardly to form pairs of spaced contact members for engaging a rivet head.

6. A riveting machine comprising a shank, a helical spring surrounding the end of said shank and having a contact finger extending beyond said end, said finger being bent outwardly to form a stop portion and backwardly to form spaced contact members, and means cooperating with said members for engaging a rivet head.

7. A riveting machine comprising a shank having a pair of helical springs surrounding the end thereof, said springs having portions extended beyond the end of said shank at opposite sides thereof, said portions being bent backwardly to form loops, the lower ends of said loops being bent outwardly to form stop portions for engaging the work to force said fingers toward said shank to free a rivet held thereby.

8. A riveting machine comprising a rivet engaging shank having the end thereof tapered, and a pair of helical springs surrounding said shank and having inwardly bent portions extending longitudinally of the tapered portion of said shank, said portions extending beyond the end of said shank but movable backwardly by engagement with the work, the tapered portion of said shank operating to spread said portions to free the rivet held thereby when said portions are moved backwardly by engagement with the work.

In testimony whereof I have signed my name to this specification on this 28th day of January, A. D. 1925.

FRANK P. BERGER.