L. H. BERTSCH.

GAG OPERATING AND CONTROLLING MECHANISM FOR PUNCHING AND RIVETING MACHINES.

APPLICATION FILED JAN. 3, 1916.

1,226,174.

Patented May 15, 1917.

2 SHEETS—SHEET 1.

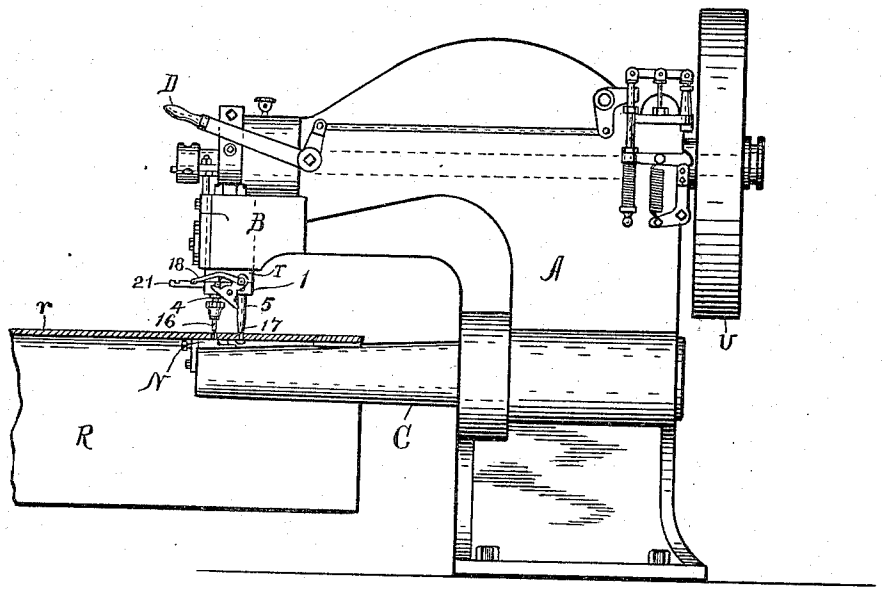


Fig. 1.

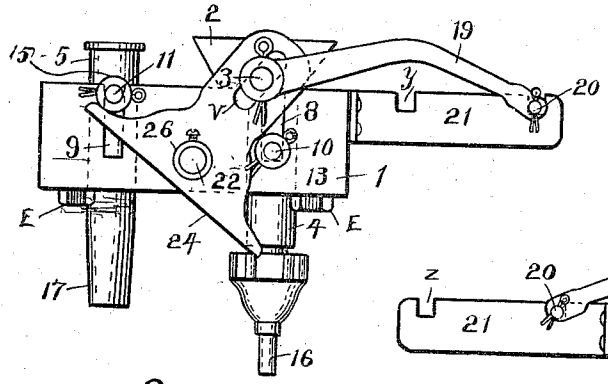


Fig. 2.

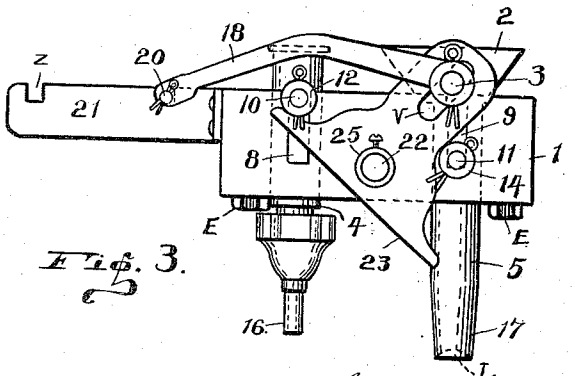


Fig. 3.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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2 SHEETS—SHEET 2.

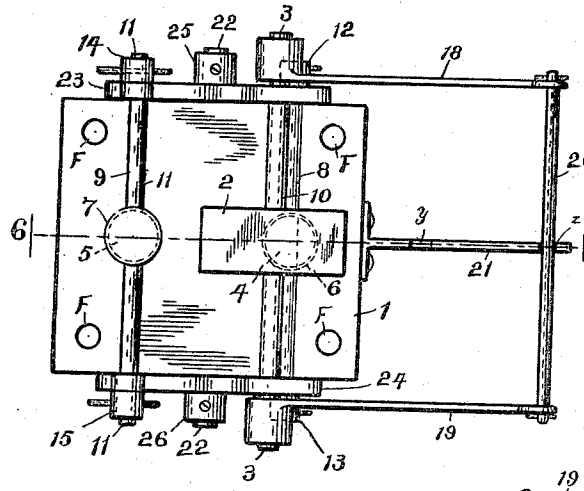


Fig. 4.

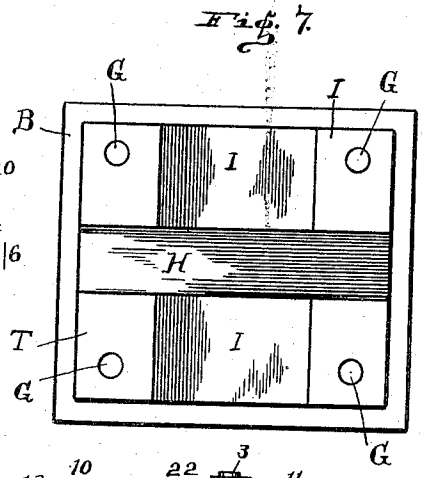


Fig. 7.

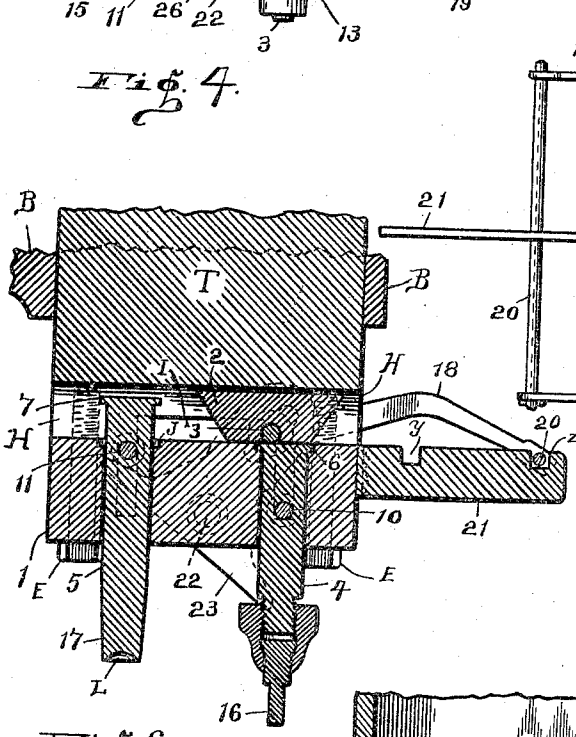


Fig. 6.

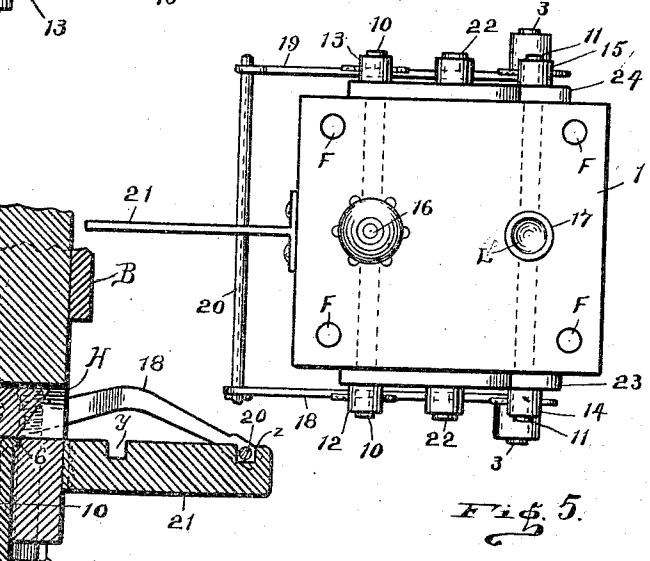


Fig. 5.

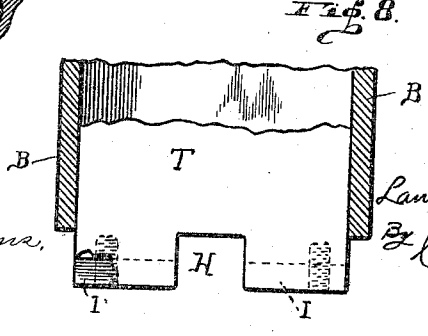


Fig. 8.

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UNITED STATES PATENT OFFICE.

LAWRENCE H. BERTSCH, OF CAMBRIDGE CITY, INDIANA, ASSIGNOR TO BERTSCH & COMPANY, OF CAMBRIDGE CITY, INDIANA, A CORPORATION OF INDIANA.

GAG OPERATING AND CONTROLLING MECHANISM FOR PUNCHING AND RIVETING MACHINES.

1,226,174. Specification of Letters Patent. Patented May 15, 1917.

Application filed January 3, 1916. Serial No. 69,895.

To all whom it may concern:

Be it known that I, LAWRENCE H. BERTSCH, a citizen of the United States, residing in Cambridge City, in the county of Wayne and State of Indiana, have invented a new and useful Gag Operating and Controlling Mechanism for Punching and Riveting Machines, of which the following is a full, clear, and comprehensive specification and exposition, the same being such as will enable others to make and use the same with exactitude.

The object of my present invention, broadly speaking, is to provide a gag operating and controlling mechanism for punching and riveting machine, the same being strong and durable in construction, positive in action, easily operated and controlled, easily attached in operative position on a machine of the character stated, and which can be manufactured and sold at a comparatively low price.

More specifically stated, my object is to provide an attachment for power driven punching and riveting machines, by the employment of which the attendant may easily and quickly shift the punch and the riveter alternately into and out of operative position, and when either the punch or the riveter are in operative position the other one of the two will be out of operative position, and in which the one movement of the operator to place one of the said tools in operative position will automatically place the other out of operative positive position and in such position that it will not in any way interfere with the work of the operator or with the tool then in use.

Another object is to provide means, in connection with that stated above, whereby the tool which has been brought to operative position will be positively locked against inadvertent displacement, while at the same time the then inoperative tool will be secured entirely out of the way of the work being operated upon by the other, and out of the way of the operator.

Other minor objects and particular advantages of the invention will be brought out and made apparent in the course of the following specification.

The preferred means for carrying out the principles of my invention in a practical manner is shown in the accompanying two sheets of drawings, in which—

Figure 1 is a side elevation of a punching and riveting machine to which my invention is attached, showing the invention in operative position, and its relation to the various parts of the machine.

Fig. 2 is an elevation of the attachment, showing one side thereof, and showing the punch in operative position, and the riveter held out of operative position.

Fig. 3 is an elevation of the attachment, showing the side thereof opposite to that shown in Fig. 2, and showing the riveter in operative position and the punch held out of operative position.

Fig. 4 is a top plan view of the device removed from the machine.

Fig. 5 is a bottom plan view of the device.

Fig. 6 is a central vertical section of the device, as taken on the line 6—6 of Fig. 4.

Fig. 7 is a bottom plan view of the face or under side of the head of the machine, and of the plunger.

And Fig. 8 is a vertical section of the lower portion of the head of the machine, and a front elevation of the lower portion of the plunger.

Similar indices denote like parts throughout the several views.

In order that the construction, the arrangement, and the operation of my invention may be more fully understood and appreciated, I will now take up a detailed description thereof, in which I will set forth the various features thereof as briefly and as comprehensively as I may.

As the machine shown in Fig. 1 is of the ordinary type of construction, it will be unnecessary to give a detailed description thereof, except to state that it comprises the main frame A, which is adapted to be secured to a floor or other foundation; the head B, which is integral with the frame and which faces downward; the plunger T which is slidable up and down in the head B, and is operated by the shaft on which the fly-wheel U is mounted; and the stake C, which extends forward horizontally from the body of the frame, and projects underneath the center of the head and the plun-

ger. The usual means are provided for placing the plunger into and out of gear, which is done by means of the lever D.

Numeral 1 denotes the body of the attachment, the same consisting of a block, whose horizontal dimensions correspond with the face of the plunger T with which its upper face is adapted to contact, and to which it is adapted to be rigidly secured by the machine screws E which extend up through the apertures F, which are formed through the corner portions of the body 1, and with their upper ends threaded into the apertures G in the plunger T.

Extending forward and rearward in the center of the face of the plunger T is the channel H, which extends parallel with the stake C.

Numeral 2 denotes the trapezoid-shaped gag-block, which is adapted to fit in and slide forward and backward in the channel H, the longer face of said block is uppermost and its smaller face is directed downward, and when the body 1 is secured in place, as in Fig. 1, it is evident that the smaller face of the gag-block will slide on the upper face of the body 1 and its larger face will slide in contact with the base of said channel H, and in contact with the sides of said channel H.

Also formed across in the face of the plunger T is a wide channel I, which crosses the channel H at right angles, but it is of less depth than the channel H.

The gag-block 2 is mounted on the center of the bar 3, and the latter is adapted to move sidewise, forward and backward, in the channel I, the extent of its movements being limited by the sides or ends of said channel I.

Formed vertically through the body 1 are two cylindrical apertures in which are slidably mounted the respective body portions 4 and 5 of the punch and the riveter, each of which has a flange, 6 and 7 respectively, formed around its upper end, there being a socket formed around each of said apertures, as the socket J shown in Fig. 6, for said heads to rest in, whereby when the members 4 and 5 are downward to their limits then their upper ends will be flush with the upper face of the body 1.

As is evident from Figs. 4 and 5, the upper ends of the members 4 and 5 may slide upward into the channel H, which would be the position of member 5 in Fig. 6, or they may slide down out of said channel, which would be the position of member 4 in Fig. 6.

Formed across the upper face of the body 1, at right angles to the channel H and parallel with and immediately forward and rearward of the channel I, are the narrow channels 8 and 9, the former crosses the center of the aperture for the member 4, and the latter crosses the center of the aperture for the member 5. The channels 8 and 9 extend down from the upper face of the member 1 to points below the center of the thickness of said member 1. Located across in the channel 8 is the rod 10; and located across in the channel 9 is the rod 11. The said rods 10 and 11 are free to move up and down in their respective channels 8 and 9.

The rod 10 passes through the member 4, to which it is secured; and the rod 11 passes through the member 5, to which it is secured.

On the projecting end portions of the rod 10 are mounted the rollers 12 and 13; and likewise on the projecting end portions of the rod 11 are mounted the rollers 14 and 15.

It is evident that the member 4 and the rod 10 are adapted to move up and down together, as are also the member 5 and the rod 11.

Attached to the lower end of the member 4, and concentric therewith, is the punch 16; and connected to the lower end of the member 5 is the riveting tool 17. A dome-shaped cavity L is formed in the lower end or face of the tool 17, and it is adapted to fit on the heads of rivets. The lower ends of the tools 16 and 17 are adapted to extend down to, or to approach near, the surface of the stake C, or the punch 16 may project into a suitable aperture in the stake, or into a stake block carried by the stake, as for instance the stake-block N indicated in Fig. 1.

Attached to the outer projecting ends of the bar 3 are the arms 18 and 19, the outer ends of which are connected by the handle-bar 20. Extending out parallel with the stake C, that is forward from the edge of the body 1, is the rack-bar 21, in the upper edge of which are two notches, y and z, in either one of which may rest the central portion of the handle-bar 20, substantially as shown.

After the device is attached to the machine, as in Fig. 1, it is evident that by means of the handle-bar 20 the gag-block 2 may be slid forward and backward in the channel H, and that when the handle-bar is placed in the notch z the gag-block will be resting on the upper end of the member 4; and if the handle-bar is then lifted and pressed back and engaged in the notch y it is evident that the punch will be released and that the block 2 will be over the upper end of the member 5, thereby securing the riveter in operative position.

Extending across through the center of the body 1, parallel with the rods 10 and 11, is the rod 22.

Rotatably mounted on the end portions of the rod 22 are the bell-shaped cams 23 and 24, which are identical with each other.

Each of said cams comprises a main ver-

tical portion having a vertical slot v therethrough, and also a round aperture formed therethrough near the base thereof, the said slot and aperture being in vertical alinement with each other and at right angles to the straight base line of the cam. Also toe portions extend at each side which are equidistant from said aperture, all substantially as indicated in the drawings. The ends of the rod 22 pass through the round apertures of the cam, whereby the said cams are rotatably mounted on the rod 22 and in sliding contact with the sides of the body 1, and secured in place by the respective collars 25 and 26 which are secured around the ends of the rod 22, substantially as shown.

The bar 3 passes through the slots v of the cams, and its end portions are adapted to slide therein, whereby it is evident that when the block 2 is drawn forward over the member 4 of the punch, as in Fig. 2, that the rearward toes of the cam will engage the rollers 14 and 15 and thereby raise the rod 11 and therefore raise the riveting tool up and out of the way of the workman and the material being operated upon by the punch. And in like manner it is evident that when the block 2 is pushed inward over the member 5 of the riveter, as in Fig. 3, that the forward toe portions of the cams will engage the rollers 12 and 13 and thereby raise the rod 10 and therefore raise the punch up out of the way of the operator and of the material being operated upon by the riveter.

The arrangement herein shown is particularly intended for punching and riveting together the overlapping edges of cylindrical pipes, such for instance as sheet metal culverts, a portion of which is denoted in Fig. 1 by the letter R, the same having the overlapping edges which form the seam r.

In practice the handle-bar 20 is first brought forward and secured in the notch z, as in Figs. 2 and 6, which, manifestly, will place the punch 16 in commission and at the same time lift the riveting tool 17 up out of the way. The pipe R is then placed around the stake C with the seam r on the center of the upper portion thereof, and the machine may then be placed in gear whereby the plunger, carrying the device, will be moved up and down and the punch 16 will form holes through the seam as the pipe is fed rearward. Then, without removing the pipe from the stake, the operator or his helper will insert a rivet in each of the holes formed by the punch, the heads of the rivets being located upward.

After the rivets are inserted then the operator will push rearward on the handle-bar 20 and secure it in the notch y, as in Figs. 1 and 3, thereby placing the riveter 17 in commission, and at the same time lifting the punch 16 up out of the way and holding it in that position until it is again required. Then again placing the machine in gear it is evident that as the plunger moves up and down the riveter will strike the heads of the rivets, as they are brought thereunder, causing them to be upset and to clench on the underside, that is inside the pipe, the movements of the pipe during the riveting operations being forward, that is to the left when considered as in Fig. 1.

It is to be understood that within the scope of the appended claims various changes may be made in the details of construction and operation from that herein set forth without departing from the spirit of the invention and without sacrificing any of the advantages thereof, and the device may be used for the various purposes for which it may be found applicable, and that it is not to be limited by such terms as "front", "rear", "up", "down", or other similar terms which are merely used for convenience in the description.

Having now fully shown and described my invention, what I claim and desire to secure by Letters Patent of the United States, is:—

1. In a punching and riveting machine having a plunger mounted in the head thereof, the combination of a block member secured to said plunger, a pair of tool members carried in said block member, a gag member mounted on said block member and adapted to alternately engage said tool members, a rod extending transversely through said gag member, a rack attached to and extending laterally from said block member, a handle bar adapted for engagement in said rack, a pair of arms connecting said handle bar and said rod whereby the gag member is given a reciprocatory motion, and means, actuated by said rod member, for raising and locking the tool members in operative position.

2. In a punching and riveting machine having a plunger mounted in the head thereof, the combination of a block member secured to said plunger and having transverse grooves formed at either end thereof, a pair of tool members, having elongated slots formed therein, of rods mounted in said grooves of the block member and adapted for engagement in the slots in said tool members, a gag member adapted to alternately force said tool members into operative position, a pair of cam members mounted in axial alinement at opposite sides of said block member, a plurality of roller bearings mounted on said rods and adapted for engagement with said cam members, and means for the dual operation of said gag member and said cam members, and for the locking of one of said tool members in an inoperative position.

3. In a punching and riveting machine having a plunger mounted in the head thereof, the combination of a tool support secured to said plunger, a pair of tool members mounted in said tool support, a gag member mounted on said tool support, means for the operation of said gag member whereby one of said tool members is placed in operative position, a pair of bell-shaped cam-members mounted for oscillatory movement at either side of said tool support and actuated by the first mentioned means, a rod connecting said cam-members and said gag member, means for alternately raising said tool members by said cam-members simultaneously with the operation of said gag member, and means for locking the raised tool member in an inoperative position.

4. In a punching and riveting machine having a plunger mounted in the head thereof, the combination of a block member secured to said plunger, a pair of tool members carried by said block member, a gag member mounted on said block member, means for the operation of said gag member whereby one of said tool members is placed in operative position, a pair of cam-members mounted on said block member and actuated by the first mentioned means whereby said tool members are alternately raised into inoperative position, and toes formed at the lower corners of said cam-members for locking the raised tool member in inoperative position.

In testimony whereof I have hereunto subscribed my name to this specification in the presence of two subscribing witnesses.

LAWRENCE H. BERTSCH.

Witnesses:

JOHN C. DODSON,

ROBT. W. RANDLE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents Washington, D. C."