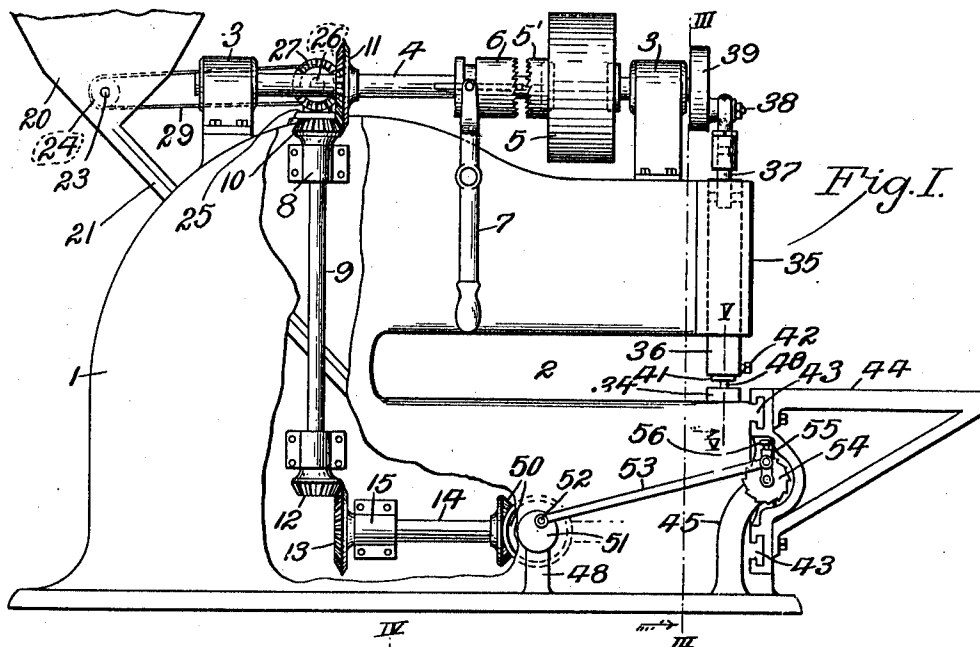


A. A. KRAMER.
RIVETING MACHINE.
APPLICATION FILED MAR. 6, 1909.

993,841.

Patented May 30, 1911.

2 SHEETS—SHEET 1.



E. Cahill.

Myself M. Jackson.

INVENTOR.

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BY

Arthur C. Brown.

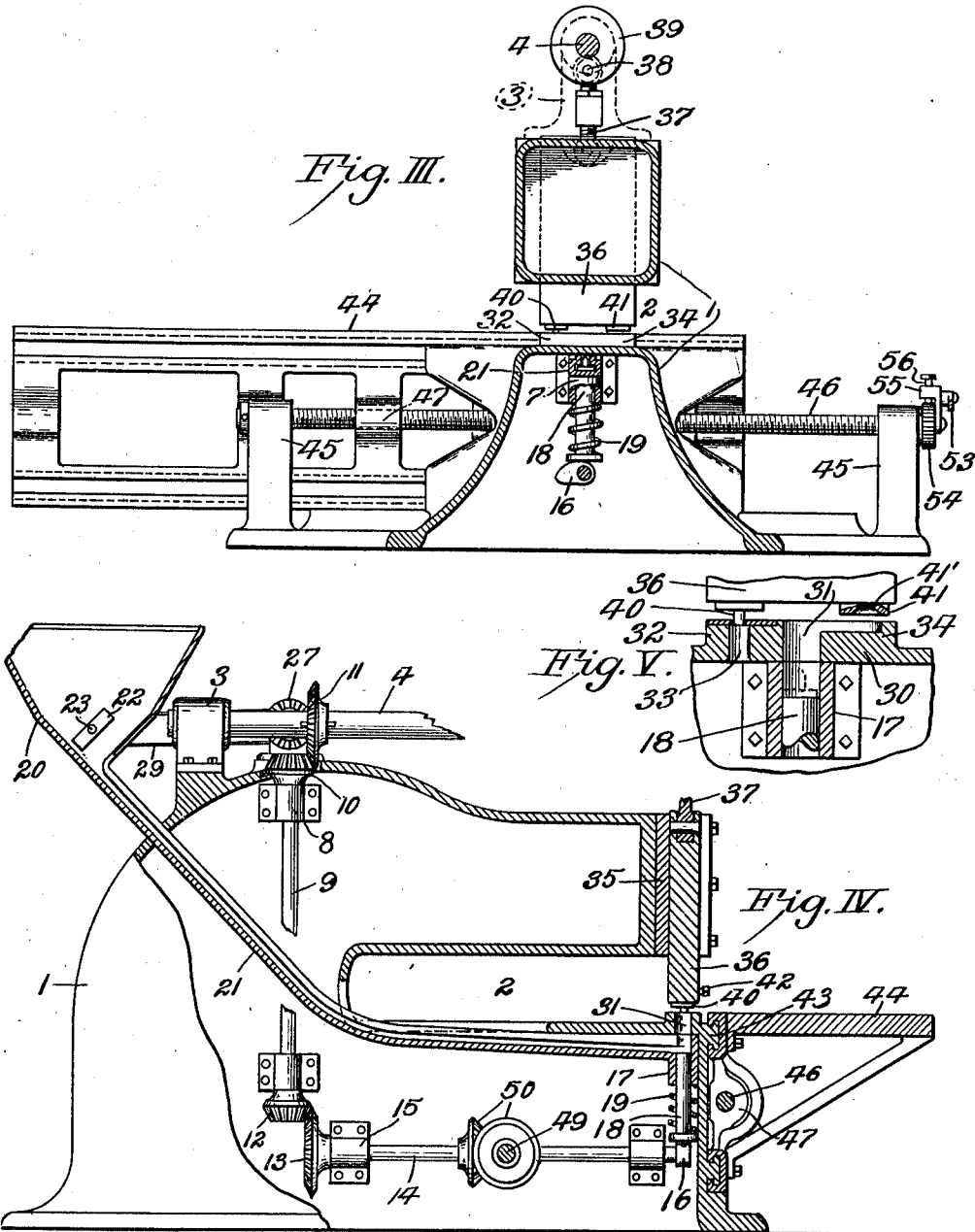
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WITNESSES:

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UNITED STATES PATENT OFFICE.

ANDREW A. KRAMER, OF KANSAS CITY, MISSOURI.

RIVETING-MACHINE.

993,841.

Specification of Letters Patent.

Patented May 30, 1911.

Application filed March 6, 1909. Serial No. 481,866.

To all whom it may concern:

Be it known that I, ANDREW A. KRAMER, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented a new and useful Riveting-Machine, of which the following is a specification.

My invention relates to riveting machines and particularly to a machine for use in riveting sheet metal, particularly in the manufacture of tanks and like articles.

The principal object of the invention is to provide a machine upon which the work may be supported and forwarded step by step, together with means for punching rivet holes and placing and heading rivets in the work.

A further object of the invention is to provide the improved details of structure hereinafter described and pointed out in the claims, reference being had to the accompanying drawings, in which:—

Figure I is a view in side elevation of a riveting machine constructed according to my invention, a part of the frame being broken away to illustrate the driving mechanism. Fig. II is a front view of same. Fig. III is a vertical section on the line III—III, Fig. I. Fig. IV is a longitudinal section on the line IV—IV, Fig. II. Fig. V is an enlarged section on the line V—V, Fig. I, showing the riveting feed punch and hammer.

Referring more in detail to the parts:—1 designates the frame of the machine which is provided at its forward end with a receiving space 2, through which the work may be fed. Mounted on the top of the frame are the bearings 3, within which is revolubly mounted a shaft 4 having a loose pulley 5 by which the shaft is revolved. Splined on the shaft 4 is a clutch collar 6 which is adapted for engagement with a clutch member 5' on the pulley 5 and has a controlling lever 7 by which it may be thrown into and out of engagement with said clutch member.

Fixed to the frame 1 are the bearings 8 within which is revolubly mounted a vertical shaft 9 having beveled gear connection 10—11 with the drive shaft 4. Fixed on the shaft 9 is a beveled gear 12 which meshes with a mating gear 13 on a horizontal shaft 14 which is revolubly mounted in bearings 15; also secured on frame 1. Rigidly fixed

on the forward end of shaft 14 is an eccentric 16. Above the eccentric 16 is a vertical guide 17 within which is slidably mounted a rivet placing plunger 18, the shank of which seats on the eccentric 16 and is held yieldingly to its seat thereon by a spring 19 which bears against the lower end of the guide 17 and against a shoulder integral with the lower end of said shank.

Supported on frame 1 is a rivet hopper 20 having an inclined runway 21 leading into the guide 17 near the top, the runway being preferably of inverted T-shape in order to support the heads of the rivets on its base with the shanks extending upwardly into the vertical slot. The runway may be open at the top as shown, in order that access may be had to the rivets, in case they should jam while being delivered from the hopper to the guide. I prefer to provide the hopper with a stirrer 22 which is fixed on a shaft 23 revolubly mounted in the hopper sides, near the mouth of the runway, in position to break up the mass of rivets, in order that they may feed singly into the runway.

On shaft 23, exterior to the hopper, is a pulley 24. Revolubly mounted in a bearing 25 on the frame 1 is a shaft 26 having a beveled gear 27 meshing with the gear 11 on the drive shaft 4; also mounted on shaft 26 is a pulley 28, and running over pulleys 28—28 is a belt 29 whereby the stirrer shaft 23 is operated.

Above the guide 17 is a bed plate 30 having a vertical channel 31 registering with the channel of the guide 17 and provided, at one side of said channel, with a punch boss 32 having a vertical channel 33; at the opposite side of the channel 31 is an anvil boss 34. In the upper portion of the frame 1, directly over the punch and anvil boss, is a guide 35, within which a block 36 is adapted for vertical reciprocation. Pivotaly connected with the upper end of block 36 is a longitudinally extensible rod 37, the upper end of which is pivotally connected with a wrist pin 38 eccentrically mounted on a disk 39 fixed on the drive shaft 4. Mounted on the lower end of the block 36, over the punch boss 32 is a punch 40 and also fixed on said block over the anvil 34 is a heading hammer 41 having a recess 41' for upsetting the rivets, as will presently be described. The block 36 is preferably re-

cessed to receive the punch 40 and hammer 41, which tools are held within the block recesses by the set screws 42.

At the front of the lower portion of the frame 1, are the horizontal guide flanges 43, upon which a table 44 is slidably mounted; the upper surface of the table being preferably in a plane with the punch and anvil bosses 32-34. Revolvably mounted in bearings 45, on the frame 1, is a screw shaft 46 which extends through and has threaded connection with a collar 47 on the table 44.

Mounted in bearings 48 on frame 1, is a shaft 49 which extends at a right angle to and has beveled gear connection 50 with the horizontal shaft 14. Fixed on shaft 49 is a disk 51 having an eccentric wrist pin 52 upon which a pitman 53 is pivotally mounted. Fixed on the screw shaft 46 is a ratchet 54 and revolvably mounted on said shaft is a lever 55 having a pawl 56 adapted for engagement with ratchet 54, the pitman 53 is connected with said lever, so that the screw shaft may be intermittently actuated through the eccentric connections with the shaft 49.

In using the machine, rivets are placed in the hopper 20 and moved therefrom into the runway, from which they are delivered onto the top of the placing plunger 18. Supposing a piece of work to be supported on the table 44, so that the parts to be connected are over the bed plate and the drive shaft to be in operative connection with the pulley 5, the block 36 is first lowered so that the punch 40 will perforate the sheet metal to make a rivet hole; the table will then be fed forwardly a short distance to bring the perforation in the sheet metal over the rivet feeding channel when the plunger 18 will be beveled by the eccentric 16 to force the rivet up into the perforation in the metal. The table will again be forwarded to bring the rivet over the anvil boss and the block 36, which has been raised after the punching operation, will again be lowered to punch a new hole and simultaneously upset the rivet through the medium of the hammer 41. It is apparent that the operation may be continued as desired and that during such operation the block 36 will simultaneously perform its punching and upsetting functions and that the puncher and table will be actuated to feed the work and rivets as described.

Having thus described my invention, what I claim as new therein and desire to secure by Letters-Patent is:—

1. A riveting machine comprising a frame having an opening in the forward portion thereof, a table mounted for movement transversely of the said opening, means for moving the said table intermittently, a reciprocatory plunger mounted in the lower portion of the frame, a reciprocatory block

mounted in the upper portion of the frame and carrying a punch and an upsetting tool, and means for moving the movable parts from a common source of power.

2. A riveting machine comprising a frame, a table mounted on said frame and adapted for movement transversely thereof, a bed plate mounted on the frame and provided with a punch channel and an anvil boss, a plunger adapted for vertical reciprocation between the punch channel and anvil boss, a block adapted for vertical reciprocation above said bed plate and provided with a punch and a hammer adapted for cooperation with the punch channel and anvil boss, and means for moving the movable parts from a common source of power.

3. A riveting machine comprising a frame, having a vertical channeled guide, a plunger adapted for reciprocation in said guide, a revoluble shaft having an eccentric fixed thereto below the guide and adapted for actuating said plunger, a block adapted for vertical reciprocation above the plunger and provided with a punch and an upsetting tool, a table adapted for movement transversely of the frame, and means for intermittently moving said movable parts.

4. A riveting machine comprising a frame having an opening in the forward portion thereof, a bed plate located in the forward portion of the frame and having a vertical channel, a guide located beneath the bed plate and having a channel continuous with the plate channel, a plunger adapted for vertical reciprocation in said channels, a runway opening into said channel, an eccentric located beneath the plunger, a spring adapted for yieldingly retaining the upper portion of said plunger below the runway and the lower portion thereof against the eccentric, said bed plate being provided with a punch channel and an anvil boss at respective sides of the plunger channel, a block adapted for vertical reciprocation above the bed plate and having a punch and upsetting tool adapted for cooperation with the punch channel and anvil boss, a table adapted for movement transversely across the frame opening, and means for intermittently moving the movable parts.

5. A riveting machine comprising a frame having an opening in the forward portion thereof, guide flanges extending transversely on the forward end of said frame, a table slidably mounted on said guide flanges and provided with a threaded collar, a screw shaft extending transversely in front of said frame and having threaded connection with the table collar, a ratchet fixed on said screw shaft, a pawl lever pivotally mounted on said screw shaft and adapted for engaging said ratchet, a shaft revolvably mounted in said frame, a disk fixed to said shaft, a pitman eccentrically mounted on said disk

and connected with said pawl lever, a plunger adapted for vertical reciprocation in said frame, a block adapted for vertical reciprocation above the plunger, and common
5 means for actuating said shaft, plunger, and block.

In testimony that I claim the foregoing

as my own, I have hereto affixed my signature in the presence of two witnesses.

ANDREW A. KRAMER.

Witnesses:

LORANA TRASK,
MARY E. PARSONS.

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