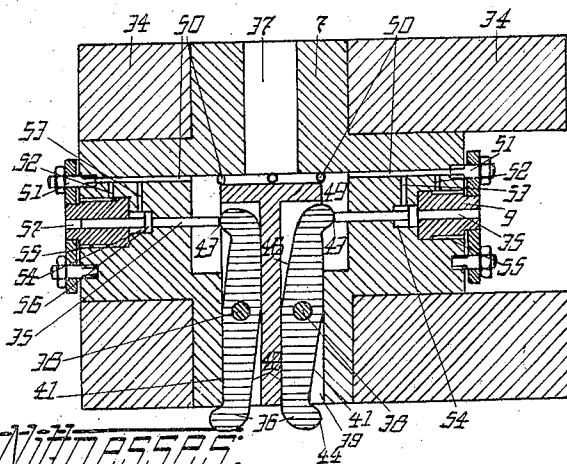


1,434,876.

File



WITNESSES:

Silly Monk
Adolf Lemke.

Inventor:

Alfred de Triès

by Ferdinand

his Attorney as far as

UNITED STATES PATENT OFFICE.

ALFRED DE FRIES, OF CASSEL, GERMANY.

REVOLVING PRESS.

Application filed December 22, 1919. Serial No. 346,811.

To all whom it may concern:

Be it known that I, ALFRED DE FRIES, a citizen of the German Republic, residing at Cassel, Germany, have invented certain new and useful Improvements in Revolving Presses (for which I have filed application in Germany June 14, January 30, 1918, and October 18, 1917), of which the following is a specification.

Hitherto it has been impossible to use presses with a revolving table for the manufacture of bolts or rivets with large heads which have to be pressed sharply, such as boiler-rivets or deeply sunk ships-rivets. One of the reasons therefor is that such presses have no device for previous upsetting which is indispensable to prevent the giving way in lateral direction of the head-iron which is relatively long. Another reason is that the heading-punch does not work with the speed required for the sharp pressing-out of the heads. There exist however presses with upsetting devices, but such devices consist of solid punches such as for example are used in the cold-presses. The solid punch is not suitable for hot-pressing as the cherry-red headed working pieces get stuck in this kind of upsetting device whereby continuous disorders are caused in their use.

The present invention has for its principal object, to obviate these inconveniences by the use of a so-called open upsetting device which opens after every pressing action and further by the increased speed of the heading-punch. This increased speed of the heading-punch is rendered possible by means of an intermediary shaft driven from the main shaft by a gear wheel which regulates the movements of the revolving table in correct proportion to the speed of the heading punch. Thus it is possible to run the main shaft which drives the heading-punch with a much higher speed than hitherto, the speed of the revolving table remaining slow. The feeding of the working pieces into the dies can be effected by hand or automatically. It is however not absolutely necessary that a feed shaft be used as under certain conditions the revolving table and the gear for the ejector pins could be operated from the main shaft.

With the above and other objects in view the invention consists in general of details of construction, illustrated in the accompanying drawings and specifically claimed.

In the accompanying drawings like characters of reference indicate like parts in the several views:

Fig. 1 is a partial section of a revolving press improved according to the present invention.

Fig. 2 is a section on line A—B of Fig. 1 showing the ejecting and cooling devices.

The movement of the die-holder is controlled from the feed shaft 1 by means of a cam disc 2 acting through the intermediary of a roller 4 upon a swinging-rod 3. The rod 3 acts upon a pawl and ratchet 5, 6 the ratchet 6 of which is keyed upon the same shaft as the die-holder 7. At each revolution of the feed shaft 1 the die 9 is moved through $\frac{1}{3}$ of the circle of the die-holder, that is through 45° . The movement of the die-holder requires $\frac{2}{3}$ of the time of one revolution of the feed shaft 1 the pressing action taking place during the remaining third.

The heading punch 10, is secured to the carrier 11 which is operated by the main shaft 14 directly by means of the crank 15 and rod 16. As a slower speed is required for the die-holder, gears 12, 13 are interposed between the feed shaft 1 and the main shaft 14. If the ratio of gear of the toothed wheels were, for example, 1:3, the die gets from the position 9₁ to the position 9₂ during the time in which the heading-punch 10 executes three strokes including the pressing.

The movement of the upsetting punch which consists of two parts 17, 18 can be derived either from the feed shaft 1 or from the main shaft 14. According to the drawing the main-shaft 14 is used, the movement being transferred from the crank 32 through the rods 19, 20 upon the shaft 21 which carries the arm 22 for the carrier of the upsetting-punch. This carrier is composed of the main slide 23 and the auxiliary slide 24 between which is a gap 25. The arm 22 engages with a slot 33 of the auxiliary slide 24. The carrier is guided in the part 31. The movement of the carriage is effected in the following manner: When the auxiliary carriage 24 is moving downwards, owing to the pressure from arm 22, it presses upon the main-slide 23 after the play 25 has been overcome. The opposite faces of the two parts of the carrier at the gap 25 serve as pressure surfaces. If now the driving arm 22 goes up, the auxiliary

carrier 24 is lifted without drawing along the main part 23 until its upper face abuts against the upper part of 23 which then participates in the upward movement. The part 18 of the upsetting tool is mounted in the carrier 23, the other part 17 being mounted in a lever 26 hinged to said carrier 23 by means of a pivot 27. The upper end of the lever 26 bears with a roller 28 against the face 29 of the auxiliary carrier 24 being thus maintained in its position whilst the upsetting is being effected. The wedge shaped lower end of the auxiliary carriage 24 penetrates between said roller 28 of the lever 26 and the back wall of carriage 23 when said auxiliary carrier is moved downwards, the roller 28, respectively the upper end of the lever 26 being thus pushed away from the main carriage so that the upsetting tool 17, 18 is closed. This device is opened again when the auxiliary carrier 24 goes up, when the roller 28 is liberated by the part 29 of the auxiliary carrier so that it can engage with the extension 30 of gap 25 through the influence of a spring or merely through the expanding of the material which has been upset. The lever 26 is thus released and the tool 17, 18 can open and liberate the rivet or bolt.

The upsetting means hereinbefore described and illustrated in the drawing can be used also in connection with other presses. The device illustrated in Fig. 2, which serves for ejecting the pressed bolts from the dies consist of a frame 34 carrying the dies 7 in which the dies 9 are located. The ejecting pins 35 guided in the cylindrical extension of the borings for the dies provided in the die-holder are submitted to the action of two-armed levers 36. The levers 36 are pivotally mounted in a bearing 8 provided in the die-holder so that they can swing around pins 38, slots 39 of said bearing 8 assuring the unimpeded movement of said levers. As can be seen from Fig. 2, the faces 40, 41 or 42 of said levers are fully or partly in contact with the walls of said slots. The noses 43 at the inner ends of the levers 36 are located so that they are adapted to exert a pressure in the direction of the axis of the ejecting pins 35. The levers 36 are actuated from the feed shaft 1 by means of a cam lever 50 operated by a cam of said shaft and hingedly connected by a connecting rod 59 with one end of a bell crank lever 60 whose other end is connected with a rod 61 in such a manner that this rod exerts a reciprocating movement.

When a pressure is exerted upon a pedal 62 the rod 45 is pulled to the left, whereby an angle lever 46, 47 is moved out of the way of the coupling pin 48 which is thus free to engage with a coupling pin of the toothed wheel 12 whereby the shaft 1 and necessarily also the system of connecting

rods 58—61 is set in motion. As soon as the pedal 62 is released, the different parts return to their normal positions, shown in Fig. 1 of the drawings so that the arm 47 of the angle lever 46, 47 gets behind the pin 48, whereby the shaft 1 is thrown out of gear and the connecting rods 58—61 are stopped.

The cooling liquid is conducted through a channel 37 into an excavation 49 of the die holder 7. Channels 50 radiating from said excavation 49 lead to the screw stoppers 51. Channels 52, 53 branch off from said channels 50, of which 53 leads to a cylindrical space 54 surrounding the ejector 35, channel 52 leading to an annular space 55 provided around the die 9. When the machine is working, the water or other cooling fluid drops thus out along the die and is thrown out through the mouth 57 of the boring of the die owing to the piston-like action of an annular collar 56 of the ejector pin 35 whereby the perfect cooling of all the parts is obtained.

I claim:

1. In a revolving press with movable die holder the combination of a rotatable die holder; an upsetting tool composed of a fixed part and of a movable part adapted to open automatically after each upsetting action and a heading punch for terminating the head of the article to be produced.

2. In a revolving press with movable die holder the combination of a main slide having an excavation in its upper part, a fixed part of an upsetting tool mounted in said slide, a two-armed lever pivotally fixed at the side of the main slide, the movable part of the upsetting tool fixed in the lower end of said lever, an auxiliary carrier located with play in the said excavation of the main slide adapted to act upon the upper end of said two-armed lever to open and close the said upsetting tool and a heading punch for terminating the head of the article to be produced.

3. In a revolving press with movable die holder the combination of a feed shaft with means for throwing out of action said feed shaft, an upsetting tool composed of a fixed part and of a movable part adapted to open automatically upon each upsetting action, a heading punch for terminating the head of the article to be produced, a set of heading dies in the movable die holder and ejector pins located in the heading dies.

4. In a revolving press of the type described and shown the combination of a rotatable die holder having a central boring, a cylinder in said boring having radial slots, two-armed levers pivotally mounted in said radial slots and ejector pins actuated by said two-armed levers.

5. In a revolving press of the type described and shown the combination of a rotatable die holder having an excavation at

its centre for the reception of cooling liquid and channels leading from said excavation to the dies. channels, leading the one to the ejector device, the other to the die. 10

6. In a revolving press of the type described and shown the combination of a rotatable die holder having an excavation at its centre for the reception of cooling liquid, channels leading from said excavation, two branch-channels of each of said In testimony whereof I affix my signature in presence of two witnesses.

ALFRED DE FRIES.

Witnesses:

WILBY WIRTH,
ADOLF LEMKE.