

July 17, 1934.

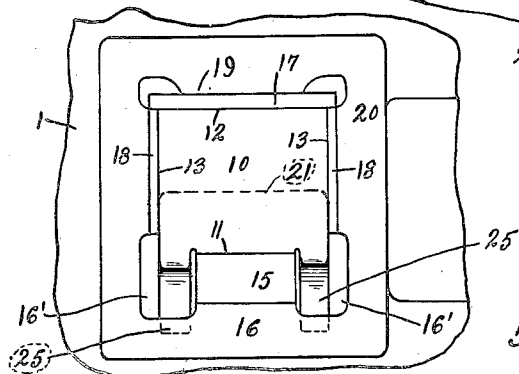
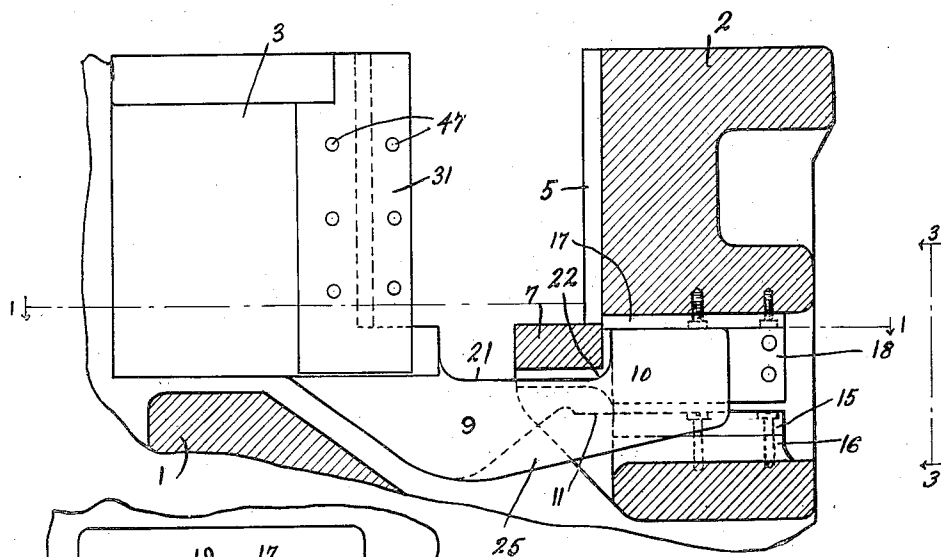
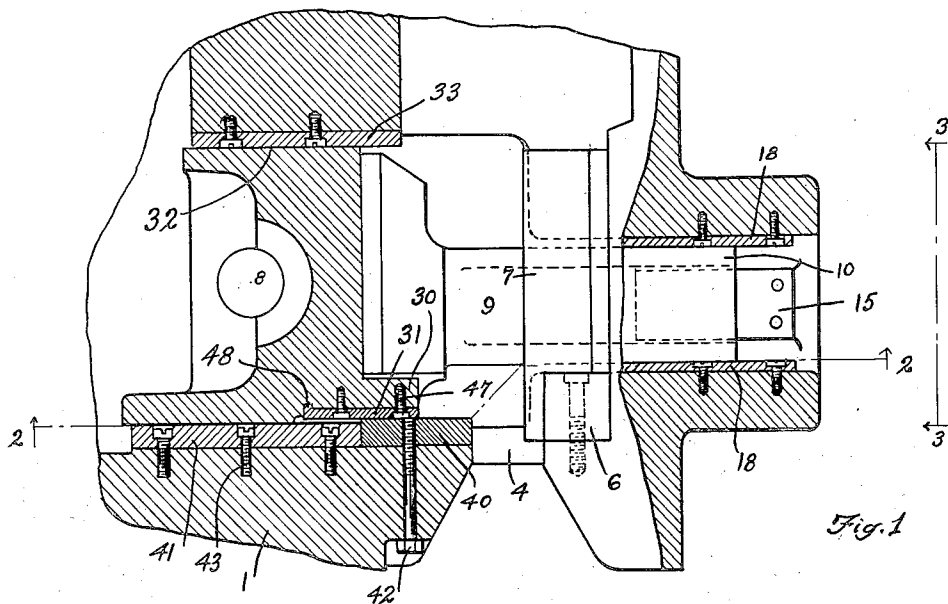
W. W. CRILEY

1,966,925

DIE SLIDE

Filed May 9, 1932

2 Sheets-Sheet 1



INVENTOR.

William W. Criley

BY

Fray O'Berlin & Fray
ATTORNEYS,

ATTORNEY,

July 17, 1934.

W. W. CRILEY

1,966,925

DIE SLIDE

Filed May 9, 1932

2 Sheets-Sheet 2

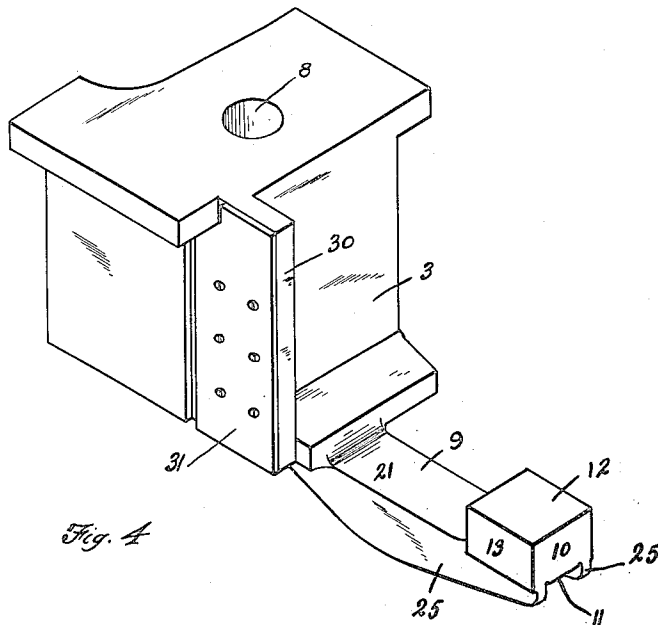


Fig. 4

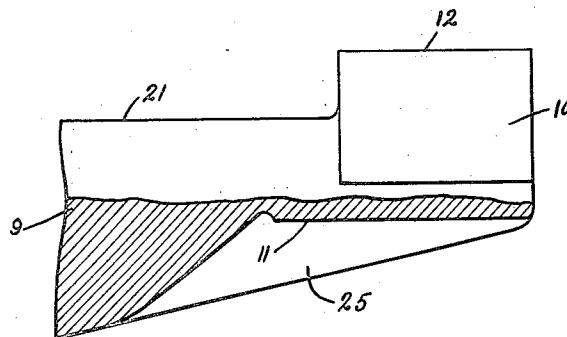


Fig. 5

INVENTOR.

William W. Criley

BY

Fay Obelin & Fay
ATTORNEYS.

UNITED STATES PATENT OFFICE

1,966,925

DIE SLIDE

William W. Criley, Cleveland, Ohio

Application May 9, 1932, Serial No. 610,104

8 Claims. (Cl. 308—3)

The subject matter of this invention is a die slide for forging machines and the invention relates particularly to bearings for such slides. Among the aims are to provide bearings which
 5 can be readily removed and replaced for adjustment purposes and which will be protected against water and scale. To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter
 10 fully described and particularly pointed out in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying my invention, such disclosed means
 15 constituting, however, but one of various mechanical forms in which the principle of my invention may be used.

The accompanying drawings show a preferred embodiment and application of the invention,
 20 Fig. 1 being a view partly in plan and partly in horizontal section on the line 1—1 of Fig. 2; Fig. 2 is a side view partly in vertical section and partly in elevation on the line 2—2 of Fig. 1;
 25 Fig. 3 is an end elevation as indicated by the arrow 3 in Figs. 1 and 2, but on a larger scale; Fig. 4 is a perspective of the die slide removed from the machine; and Fig. 5 is an enlarged detail of the die slide extension, partly broken
 away.

30 In the drawings a portion of the frame of the machine is indicated at 1, the stationary die seat is indicated at 2, the moving die slide at 3 and the opening for the introduction of stock at 4. Only the die seats are shown, the dies being
 35 omitted, and no attempt has been made to show the elements of the mechanism in general. The type of machine in which these are used is well known, early examples being the patents to Blakeslee et al. No. 184,135 of November 7, 1876
 40 and Blakeslee No. 364,208 of July 7, 1887. The element 2 of the present disclosure corresponds to the element N of that patent and the element 3 of the present disclosure corresponds to Blakeslee's element G. The stationary die seat 2 has
 45 the usual side liner 5, thrust block 6 and bottom liner 7. An operating toggle arm, or equivalent actuating means, will be pivoted at 8 to the movable die slide 3. The slide 3 is equipped with a
 50 work gap and carrying a piloted end 10 beneath the stationary die seat 2. This piloted end 10 has a supporting bearing face 11, a top guide face 12 and side guide faces 13. The supporting bearing face 11 works against a bottom liner 15
 55 which is supported on a bed frame rib 16, the face 12 bears against a top liner 17 and the faces 13 bear against side liners 18. All of these liners are supported and attached to corresponding machine frame surfaces 16, 19 and 20 by suitable bolts (omitted from Fig. 3). Channels 16' be-
 60 tween the machine frame and the piloted end go down well below the bearing face 11 to allow water carrying scale, and so forth, running from the dies over the upper surface 21 of the arm 9, and down the sides of the arm, to drain off with-
 65 out reaching the bearing surfaces. The arm 9 is hollowed out on the underside at the piloted end, leaving the bearing surface 11 as indicated in Fig. 2 and side skirts 25 as best seen in Figs. 2 and 3. It will be noted that these skirts clear
 70 the rib 16 and also clear the bearing passage through the machine frame below the side liners 18. The liner 15, as apparent from Fig. 2, is below the top surface 21 of the arm 9 so that water and scale would run onto it except for the protection
 75 afforded by the skirts 25, clearance for the discharge of same being afforded by channels 16'. A raised fillet 22 turns the flow sideward and down over the skirts 25 well short of the end of the arm 9, so that no water and scale flows
 80 over the end onto the liner 15.

The movable die slide 3 has an integral lip 30 to support the moving die against the thrust of the heading operation. This lip is inwardly faced
 85 by a liner 31 which can be lined up for proper operating clearance with the moving die thrust block 40 by suitable shimming. The slide 3 bears on its forward side 32 against a plate 33 suitably secured in the bed frame. The back bearing ar-
 90 rangements are made with a view to their removal, replacement and adjustment. Special arrangements have to be made for these purposes on account of the integral lip 30. The arrangement includes two thrust blocks 40 and 41 which
 95 are really large flat plates secured to the machine frame. The thrust block 40 is fastened by a plurality of aligned bolts 42 inserted through from the outside of the machine frame as shown in Fig. 1, and accessible from outside, and the block
 41 is secured by several screws 43. The block 40
 100 can be aligned independently of 41.

The movable die slide carries the liner 31 fastened to the slide 3 by screws such as 47, countersunk from the bearing face. The screws
 47 are arranged at levels corresponding to those
 105 of the holes for the bolts 42. The liner 31 is also positioned by a tongue 48 which fits into a corresponding vertical groove in the side of the moving die slide 3 to prevent end play.

To take out the thrust block 40 and liner 31,
 110

both of which are subject to severe localized wear from the heavy pressure to which they are subjected combined with exposure to scale and water from the forging dies, remove the bolt 42, of which there are three vertically aligned to correspond with the screws 47, Fig. 2, then lift the thrust block 40 vertically, then move the die slide 3 toward the closing position to bring the first row of screws 47 opposite the bolt holes so that these screws can be removed through the bolt holes. After these are removed the die slide 3 is closed further, to bring the second row of screws 47 opposite the bolt holes, the screws of this row are removed and the liner 31 lifted out. In detail, the liner is moved away from the body of the slide 3 to clear the tongue 48 from its slot, the liner is next moved edgewise out from under the end of the top wing bearing, and then can be lifted.

It will be seen that the worn irregular surfaces of thrust block 40 and liner 31 can thus be readily removed to be re-machined to accurate planes and reinstalled in the machine with suitable shimming without necessitating the laborious and expensive operation of disassembling the moving die slide 3.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:

1. In a forging machine, a movable die slide and a fixed die seat, said slide comprising an arm extending beneath the fixed seat, a central bottom bearing on the outer end of said arm below the level of the top of the arm, and skirts on said arm extending down on each side of said bearing.

2. In a forging machine, a movable die slide and a fixed die seat, said slide comprising an arm extending beneath the fixed seat, a central bottom bearing on the outer end of said arm below the level of the top of the arm, an elevated surface across the top of said arm inboard of the outer end, and skirts on said arm extending down on each side of said bearing.

3. In a forging machine, a movable die slide and a fixed die seat, said slide comprising an arm extending beneath the fixed seat, bearings on four longitudinal surfaces on the outer end of said arm, the bottom one of said bearings being below the top level of the arm, guides for said surfaces backed throughout their extent by the machine frame, and channels defined within the machine frame offsetting the guide for said bottom bearing, the bottoms of said channels being below the bottom bearing surface.

4. In a forging machine, a movable die slide and a fixed die seat, said slide comprising an arm extending beneath the fixed seat, bearings on four longitudinal surfaces on the outer end of

said arm, the bottom one of said bearings being below the top level of the arm, guides within the machine frame for said surfaces, channels defined within the machine frame offsetting the guide for said bottom bearings, the bottoms of said channels being below the bottom bearing surface, and downward skirts on the sides of said arm extending into said channels, the area of said channels being substantially in excess of that required for clearance of said skirts.

5. In a forging machine, a movable die slide and a fixed die seat, said slide comprising an arm extending beneath the fixed seat, bearings on four longitudinal surfaces on the outer end of said arm, the bottom one of said bearings being below the top level of the arm, guides within the machine frame for said surfaces, channels defined within the machine frame offsetting the guide for said bottom bearings, the bottoms of said channels being below the bottom bearing surface, downward skirts on the sides of said arm extending into said channels, the area of said channels being substantially in excess of that required for clearance of said skirts, and an elevation across the top of said arm disposed inwardly of the end of the arm.

6. In a forging machine, a fixed die seat and a movable die slide with an integral die supporting lip, opposed side bearings in the machine body and on said slide, comprising a flat liner attached to the slide behind the die supporting lip and two flat thrust blocks of different width attached to the machine frame, one of said thrust blocks being secured by bolts through holes in a part of the machine frame, said slide liner being secured by screws adapted to be aligned with said bolt holes by movement of the slide and said screws removable through said holes.

7. In a forging machine, a movable die slide and a fixed die seat, said slide comprising an integral die supporting lip and an arm extending beneath the fixed die seat, a bottom bearing on the outer end of said arm, below the level of the top of the arm, side bearings between the slide and machine body comprising opposed removable elements, certain of said elements being vertically removable and others being removable by movements including horizontal movement into a position opposite the vacancy left by the first removal.

8. In a forging machine a movable die slide and a fixed die seat, said movable slide comprising an arm extending under said seat and into a passage defined by interior walls of the machine frame, said arm having on its extremity a bottom bearing below the upper surface of said arm, said arm also having side bearings and a top bearing, and guides in said passage adapted for engagement with said bearings respectively, means carried by said arm to divert water from said bottom bearings, and drainage channels in said passage well below said guide for the bottom bearing.

WILLIAM W. CRILEY.

CERTIFICATE OF CORRECTION.

Patent No. 1,966,925.

July 17, 1934.

WILLIAM W. CRILEY.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, lines 80 and 94, claims 4 and 5, for "bearings" read bearing; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 11th day of September, A. D. 1934.

Leslie Frazer

(Seal)

Acting Commissioner of Patents.