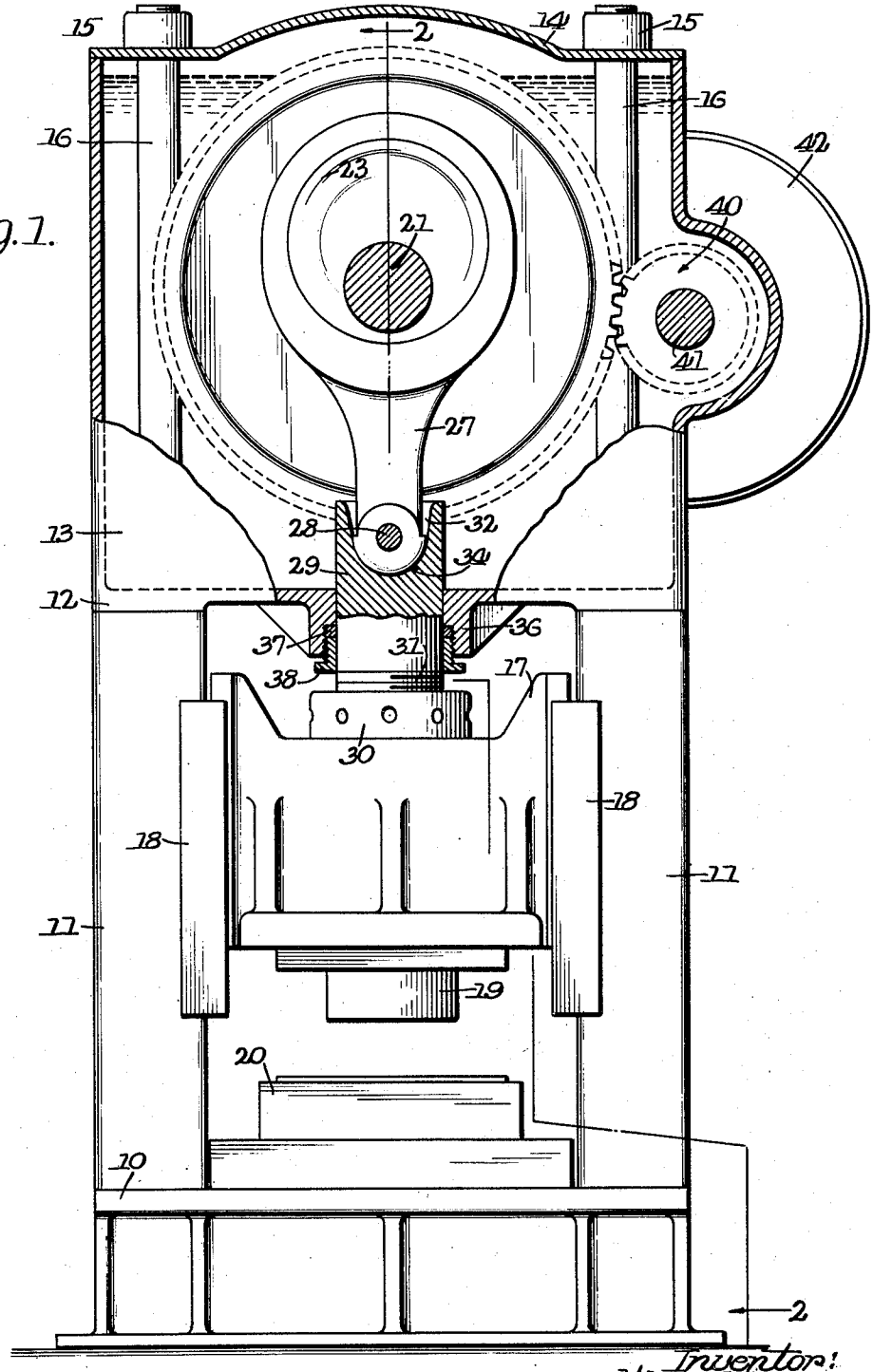
Oct. 16, 1934. R. W. GLASNER 1,977,549

METAL WORKING PRESS

Filed Aug. 4, 1934 8 Sheets-Sheet 1

Fig. 1.



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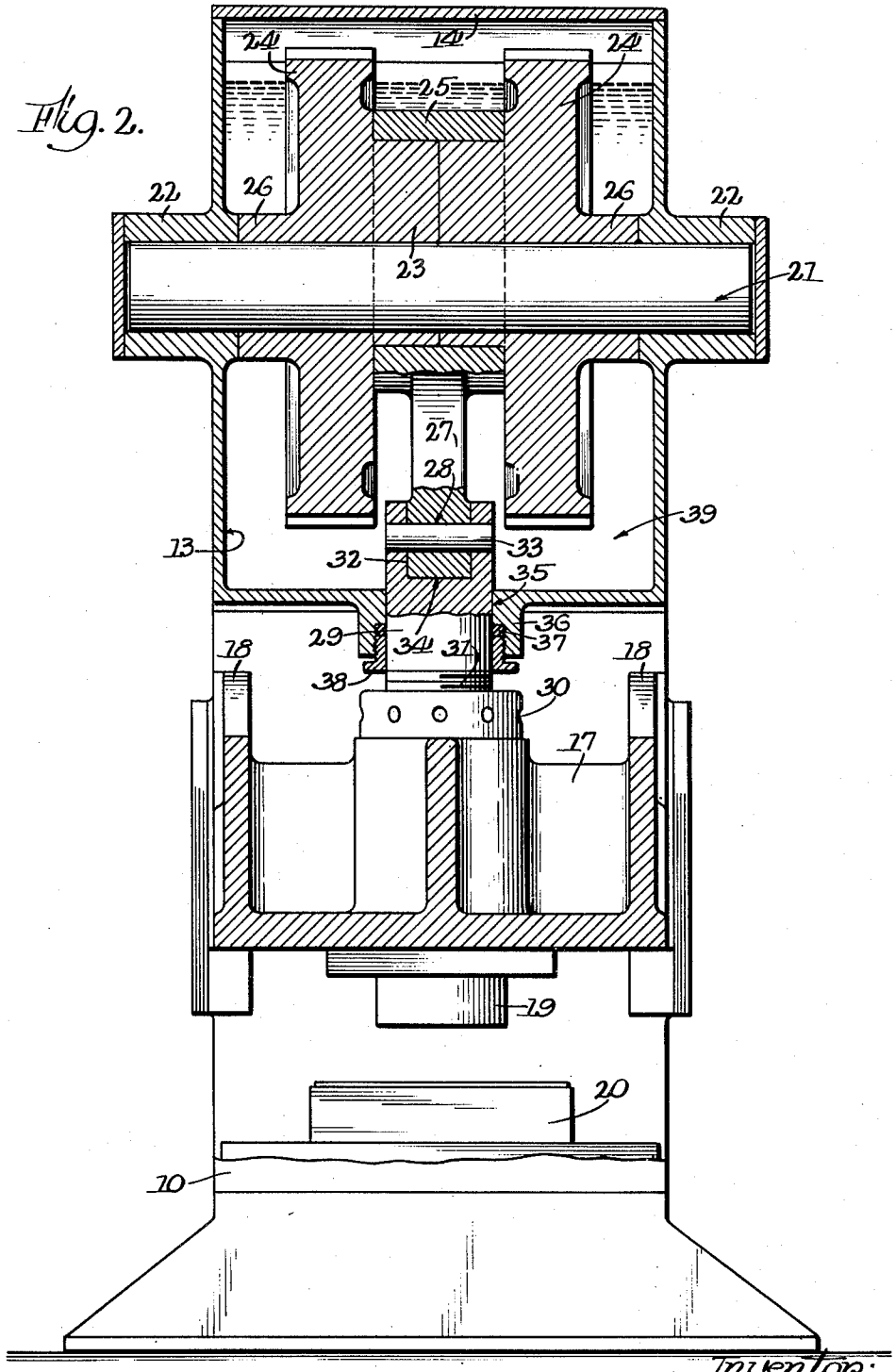
By: Attty.

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METAL WORKING PRESS

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Fig. 2.



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METAL WORKING PRESS

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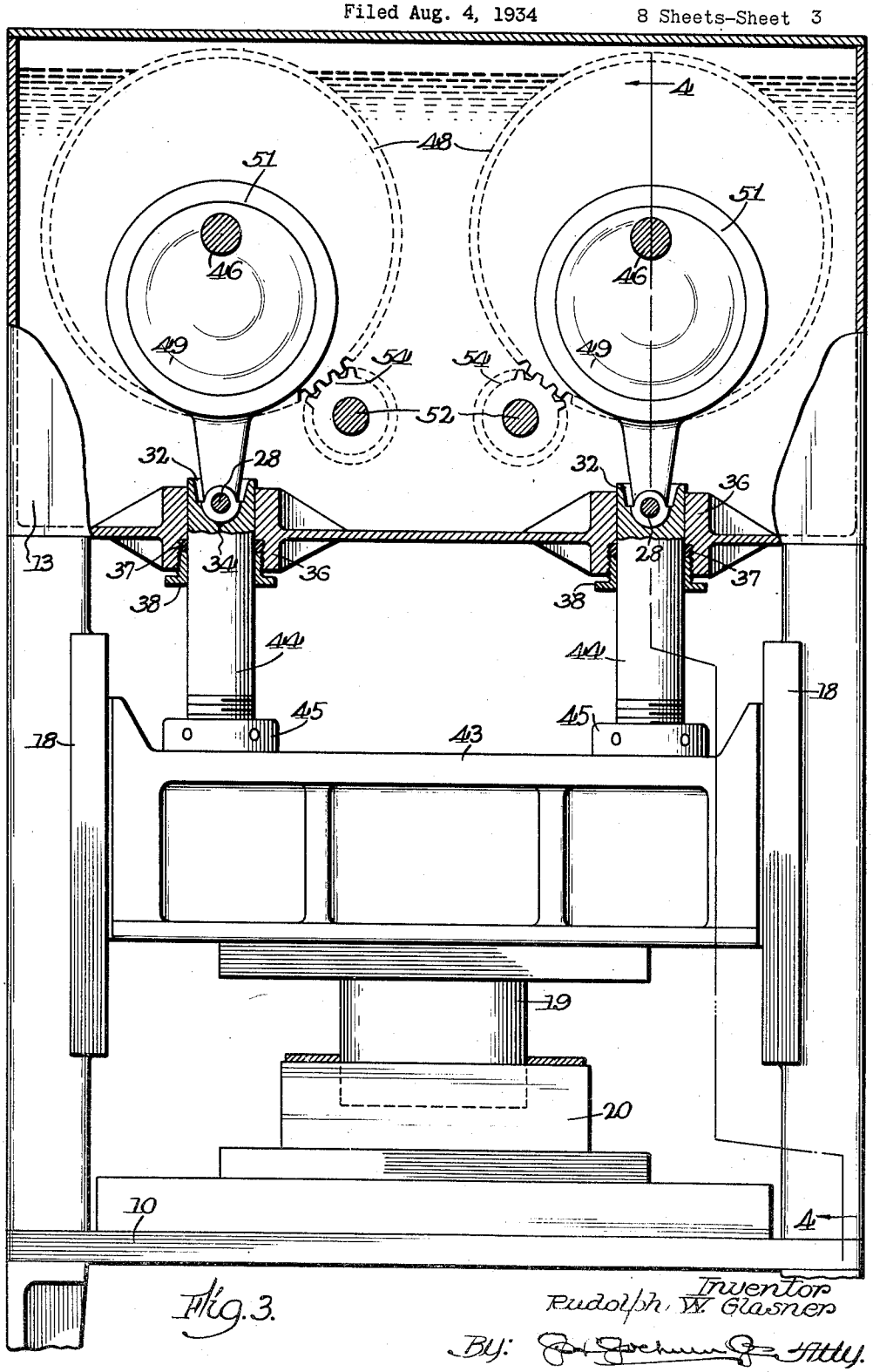


Fig. 3.

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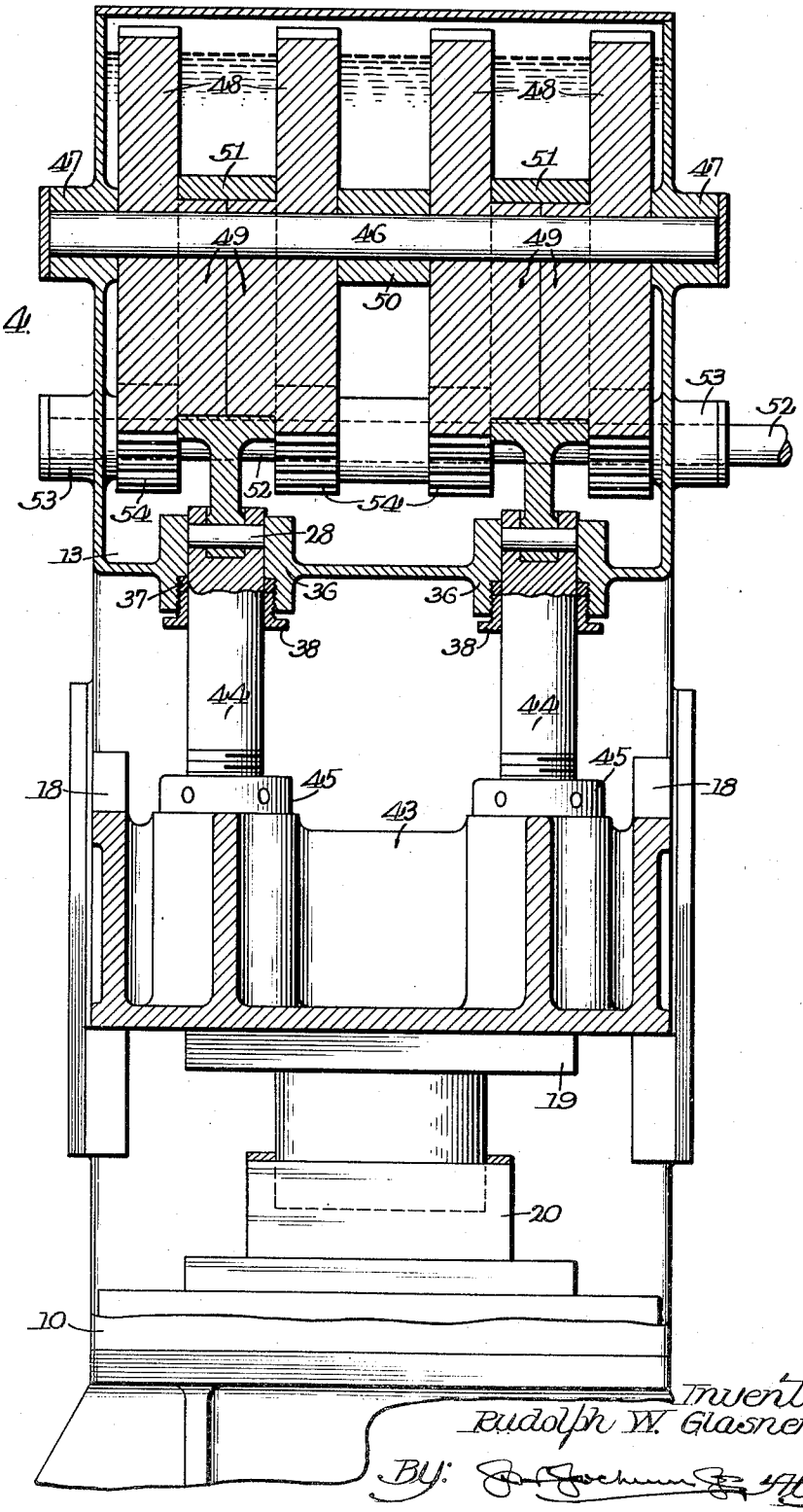
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Oct. 16, 1934. R. W. GLASNER 1,977,549

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Fig. 4.



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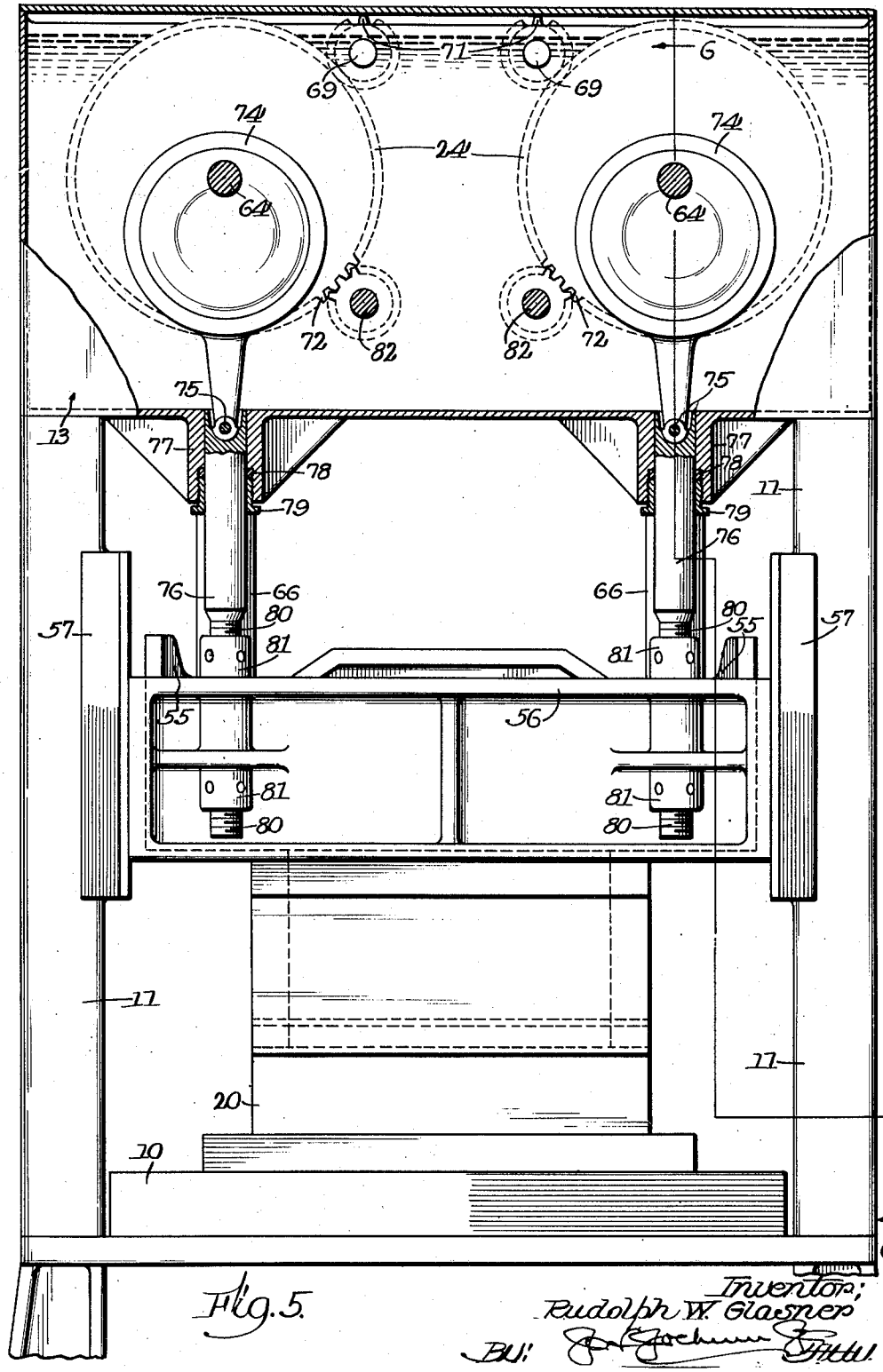


Fig. 5.

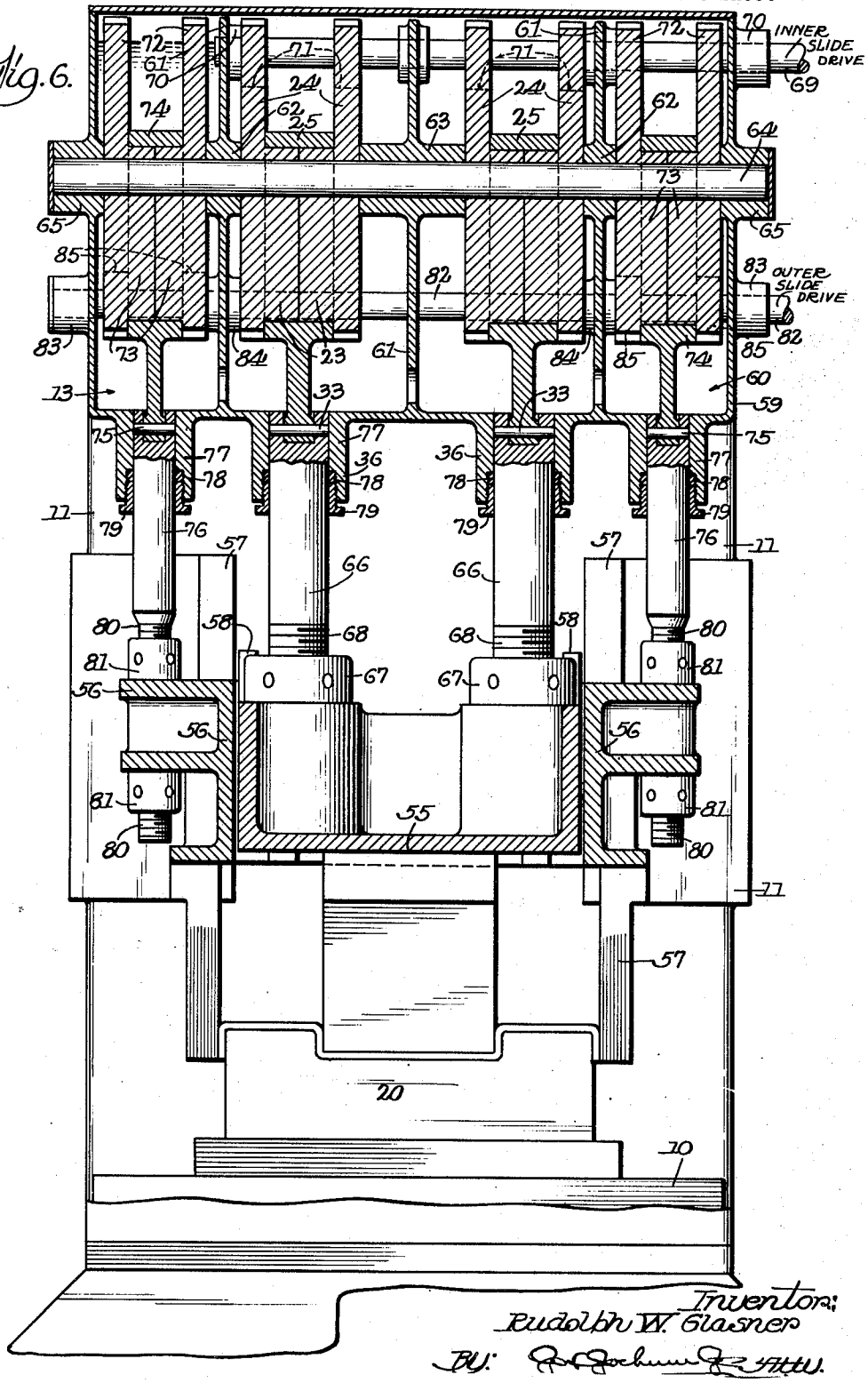
Inventor;
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Oct. 16, 1934. R. W. GLASNER 1,977,549

METAL WORKING PRESS

Filed Aug. 4, 1934 8 Sheets-Sheet 6

Fig. 6.



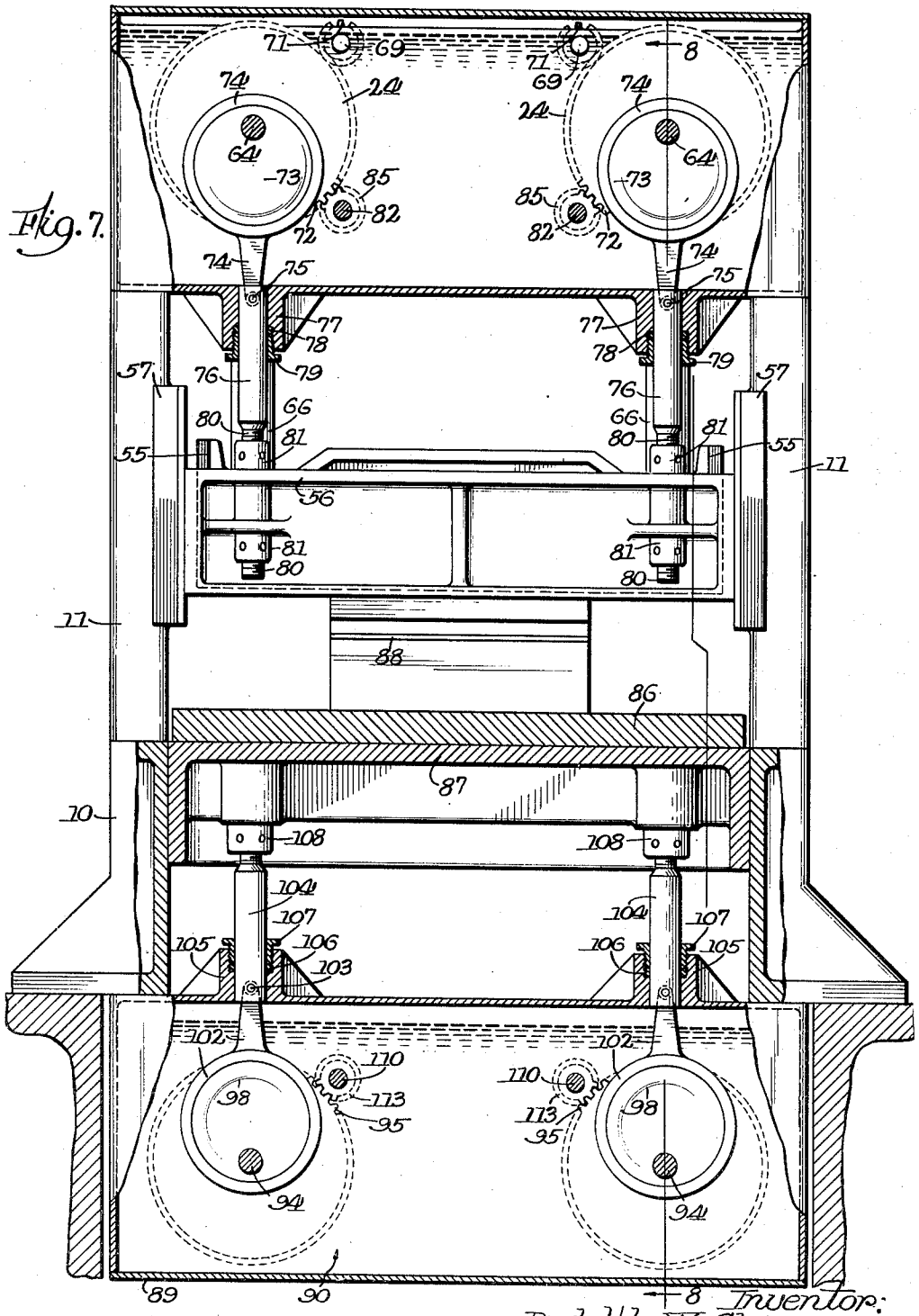
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Oct. 16, 1934. R. W. GLASNER 1,977,549

METAL WORKING PRESS

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Fig. 7.



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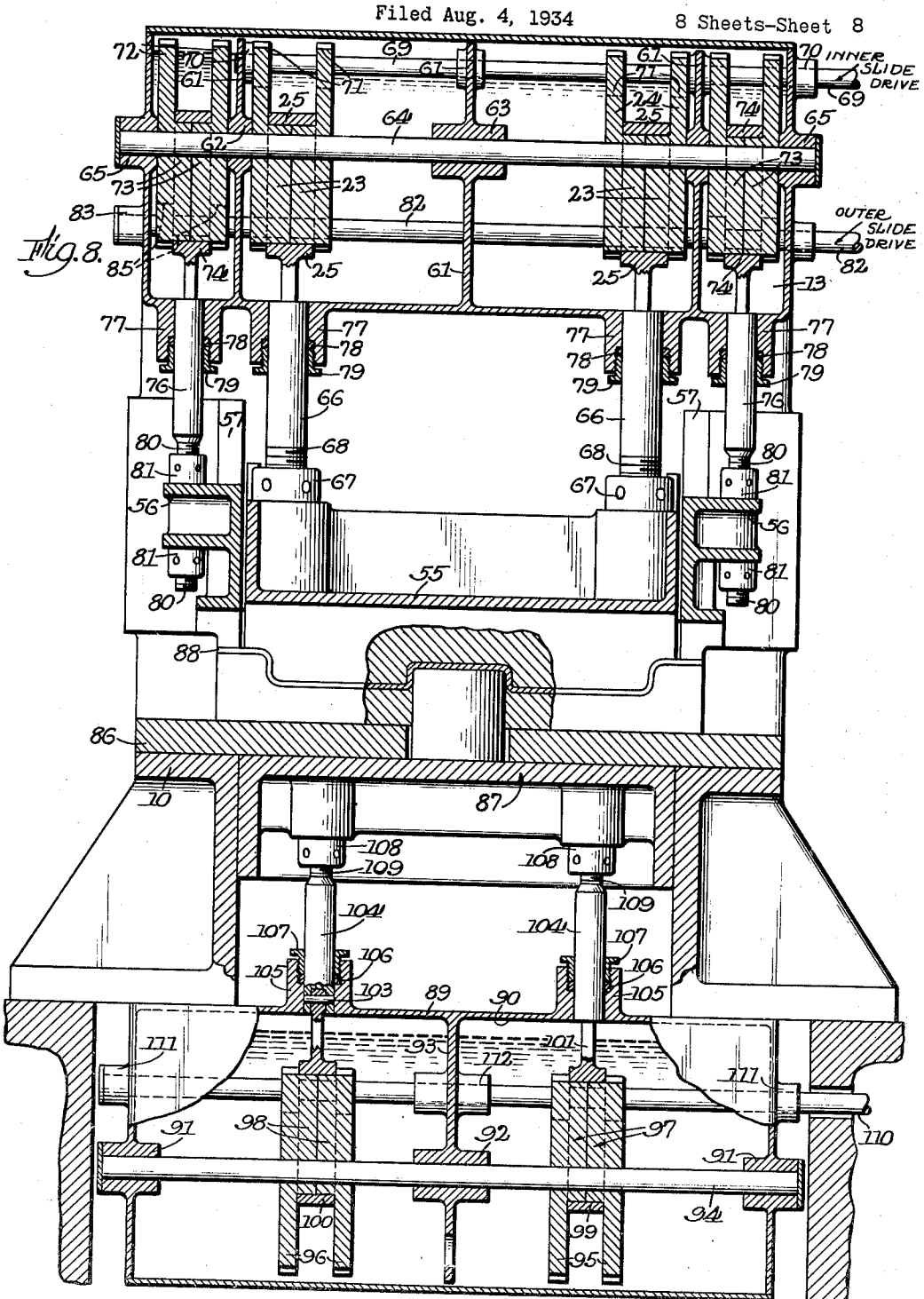


Fig. 8.

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UNITED STATES PATENT OFFICE

1,977,549

METAL WORKING PRESS

Rudolph W. Glasner, Chicago, Ill.

Application August 4, 1934, Serial No. 738,554

13 Claims. (Cl. 113—38)

This invention relates to improvements in metal drawing presses of the type embodying a reciprocable slide, and one of the objects of the invention is to provide improved means for maintaining the slide against tilting and also from sidewise movement when work to be performed is exerting strains against the face of the slide, and which strains are unevenly distributed over the area of either the bed or slide.

Heretofore it has been necessary to provide individual lubricating means leading to each bearing, which required constant attention, causing expensive repairs. It is another object of the present invention to provide improved means for lubricating the rotary members and for eliminating the individual lubricating means.

A further object is to provide a structure of welded steel, greatly increasing the strength of the press and reducing the weight material and also rendering it unnecessary to provide patterns in each case when the shape of the press is altered.

A still further object is to provide a welded steel frame structure, the plates of which receive all the stresses and strains, while the welded seams or joints will be relieved from such stresses.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts hereinafter more fully described and claimed and shown in the accompanying drawings illustrating this invention and in which

Figure 1 is a view partly in front elevation, partly in section, and with parts broken away, of a single action press, constructed in accordance with the principles of this invention.

Figure 2 is an irregular, vertical sectional view, taken on line 2—2, Figure 1.

Figure 3 is a vertical sectional view, of a single action press of another type, constructed in accordance with the principles of this invention.

Figure 4 is an irregular, vertical sectional view, taken on line 4—4, Figure 3.

Figure 5 is a view partly in elevation, partly in vertical section and partly broken away, of a double action press, constructed in accordance with the principles of this invention.

Figure 6 is an irregular, vertical sectional view taken on line 6—6, Figure 5.

Figure 7 is a view, similar to Figure 5, of a triple action press, constructed in accordance with the principles of this invention.

Figure 8 is an irregular, vertical sectional view, taken on line 8—8, Figure 7.

Referring more particularly to the drawings and in the forms of the invention shown in Figures 1 to 6, the numeral 10 designates generally the bed of the press, provided with uprights 11 and a crown 12, constituting the press frame.

The frame is of a welded steel structure and the crown is hollow and shaped to form a lubricant receptacle and container 13.

A cap plate 14 is provided to form a closure for the container, and this plate may be removably secured in position by means of nuts or collars 15 secured to tie or anchor rods 16.

In Figures 1 and 2, the numeral 17 designates a slide or ram movable in guides 18 which are connected to the uprights 11, and the slide is adapted to carry a die 19 which co-operates with and is movable toward and away from a die 20 mounted upon the base of the press, as the slide is reciprocated.

The numeral 21 designates a shaft which is supported by the front and rear plates of the crown, the shaft being preferably mounted in bearings 22 extending beyond the outer faces of the crown member, so that the bearings will have communication with the inside of the container.

Mounted upon the shaft 21 is an eccentric 23, which is preferably sectional and secured to each of the sections and on opposite sides of the eccentric, are gears 24, all disposed within the crown or container 13. The gears 24 are integral with the respective sections of the eccentric.

An annular eccentric strap 25 is disposed between the gears 24 and encompasses the eccentric, and this strap is of integral construction. In assembling the eccentric and strap, the sections of the eccentric are inserted into the strap through the ends thereof, the parts being held in assembled position preferably by reason of the ends of the hubs 26 of the gears 24 abutting the ends of the respective bearings 22. The projecting end 27 of the eccentric strap is preferably provided with an opening 28 therethrough.

The numeral 29 designates a member or pillar which is connected to the slide 17 at one end in any suitable manner, preferably by means of a nut or collar 30 engaging threads 31 on the adjacent end of the member 29. This member 29 is of a substantial length and is adapted to be adjusted in a direction lengthwise of its

longitudinal axis and with respect to the slide 17, but the member 29 will be rigidly connected with the slide. The upper extremity of the member 29 is bifurcated as at 32 and the extremity 27 of the eccentric strap 25 projects into the bifurcation, a pin 33 passing through the walls of the bifurcation of the member 29 and the extension 27 of the eccentric strap forms a pivotal connection between the eccentric strap and the member 29. The extremity of the projection 28 preferably engages the bottom of a curved seat 34 at the bottom of the bifurcation in the member 29, so that by the end of the extension 27 of the eccentric strap 25 contacting therewith to force the slide 17 downwardly, the pivot pin 33 will be relieved of resistance strains exerted upon the pivot.

The walls of the bifurcation 32 are shaped so as not to interfere with the pivotal movement of the eccentric strap with respect to the member 29.

Obviously, any other form of connection between these parts may be provided.

The bottom wall of the container 13 is provided with an opening 35 through which the member 29 slides, and encompassing the opening is a bearing 36 having packing 37 and a packing gland 38. This bearing 36 is of substantial length and serves the purpose of preventing the lateral stresses upon the member 29 from moving this member laterally with respect to the slide 17. Furthermore, this member 29 serves the purpose of relieving the slide guides 18 from lateral stresses of the slide, and with this construction it will be manifest that the slide 17 will be held not only against lateral or edgewise movement, but it will also be maintained against tilting movement at any point in the cycle of operation of the slide, regardless of the point at which stress of the work is exerted upon the slide throughout the area of the face of the slide.

The bearing 36 and the member 29 are of a relative length that the pivot 33 will always be maintained within the confines of the outer end of the bearing 36.

The container 13 is adapted to hold a lubricant 39 and the packing 37 will prevent the lubrication from leaking through the bearing.

With this construction it will be manifest that all of the operating parts for the slide are disposed within the container 13 so that they will be immersed and will be maintained thoroughly lubricated, thereby obviating the necessity of providing lubricating ducts or channels, which heretofore have been employed and which lead to the respective bearings.

Motion may be imparted to the gears 24 in any suitable manner, such as by means of gears 40 which mesh with the respective gears 24, and which gears 40, together with the driving shaft 41 to which they are secured, are located within the container 13.

A drive pulley 42 is connected to the shaft 41 and this pulley 42 receives its motion from any suitable source of power.

In the form of the invention shown in Figures 3 and 4, the press is of a similar construction as that disclosed in Figures 1 and 2, with the exception that there is provided what might be termed a four-point connection between the slide 43 and the operating mechanism which is located within the container 13.

In this form of the invention four members 44 are secured to the slide 43, preferably by means of a connection 45, which may be adapted for adjusting the members 44 in directions lengthwise of their axes.

A pair of parallel shafts 46 are mounted by their ends in bearings 47 which have communication with the interior of the container 13, and mounted upon each of the shafts are a plurality of pairs of gears 48, each of which gears having connected to it a section 49 of an eccentric, similar in construction to the gear and eccentric 23—24 in the form of the invention shown in Figures 1 and 2. A spacing member 50 may be provided between the proximate gears 48 of the pairs to hold the gears in proper position.

Eccentric straps 51 of integral construction encompass the eccentric sections 49, and these eccentric straps 51 are pivotally connected to the respective members 48 in the same manner as the connection between the eccentric strap 25 and the member 29 in the form of the invention shown in Figures 1 and 2.

A driving shaft 52 is mounted in suitable bearings 53 supported by the wall of the container 13 and passes through the container, the inner ends of the bearings 53 being in communication with the interior of the container 13. Gears 54 individual to the gears 48 are mounted upon the respective shafts 52 and mesh with the respective gears 48. These shafts 52 may be given rotation in any desired or suitable manner.

In this form of the invention, as in the form shown in Figures 1 and 2, all of the slide reciprocating means is located within the container 13 and immersed in the lubricant in the container, and during the operation of the slides in each of these forms of the invention, the pivotal joint 33 will move into and out of the container and will be maintained lubricated.

In this form of the invention the slide 43 will also be maintained against edgewise movement and against tilting movement at any point in the cycle of reciprocation of the slide, and the bearings 36 will maintain the members 44 against lateral movement with respect to the slide 43, under the stress exerted upon the members 44 by the eccentric straps 51, and it will also be manifest that the members 44 will at all times be maintained substantially parallel.

In the form of the invention shown in Figures 5 and 6, a double action press is disclosed, the numeral 55 designating the inner slide and the numeral 56 designating the outer slide. The outer slide moves in guides 57 carried by the uprights 11, while the inner slide moves in guides 58 carried by the outer slide.

The crown 59 in this form of the invention, is also shaped to form a container 60, and partitions or uprights 61 are disposed within the container to provide bearings 62 and a bearing and spacing member 63. Parallel shafts 64 extend respectively through the bearings 62—63 and are respectively mounted at their ends in bearings 65, supported by the walls of the container and which latter bearings have communication with the interior of the container. The inner slide 55 has connected with it a plurality of upright members or pillars 66 which are preferably of a substantial length secured at one end to the slide 55 by an adjustable connection, preferably in the form of a nut or collar 67 engaging threads 68 on the respective members 66. These members 66 pass through the bearings 36 and are connected through the medium of the pivotal joint 33 with the eccentric straps 25, the latter passing over the sectional

eccentrics 23 secured to and forming part of the gears 24.

Shafts 69 are journaled in suitable bearings 70, one of which is preferably supported by one of the walls of the container and the other by one of the partitions 61, and extends into the container, the shaft receiving its motion from any suitable source of power. Mounted upon each of these shafts 69 are gears 71 which mesh with the respective gears 24 for rotating them and for rotating the eccentrics 23 to thereby impart a sliding movement to the slide 58.

Additional gears 72 having sections 73 of eccentrics, formed integral therewith, are mounted upon the shafts 64, and eccentric straps 74 of integral construction, encompass the respective eccentric sections 73 and are pivotally connected as at 75 with members 76, which latter operate at one end in the bearings 77 supported by the bottom of the crown or container 13, the bearings 77 being provided with a packing 78 and a gland 79, the bearing 77 being of a substantial length so that the point of pivotal connection 75 between the members 76 and the eccentric straps will always be maintained within the confines of the outer end of the bearing.

The members 76 are connected to the outer silde 56 in any suitable manner, preferably by means of a reduced end 80 thereof passing through a portion of the slide 56. Nuts or collars 81 engage the threaded portion of the member 77 on opposite sides of the portion of the slide 56, through which it passes for securing the member 76 to the slide 56 for relative and fixed adjustment in directions lengthwise of the longitudinal axes of the members 76.

Driving shafts 82 which receive their power from any suitable source, are journaled in suitable bearings 83 supported by the wall of the container or crown of the press and also by bearings 84 carried by the partitions 61. Gears 85 are secured to the shafts 82 and mesh respectively with the gears 72 to which the eccentric sections 73 are secured, so that when the shaft 82 is rotated, the gears 72 will be rotated and a reciprocatory movement will be imparted to the outer slide 56.

In this form of the invention it will also be manifest that all of the members 66 and 76 will be maintained parallel, and the bearings 36 and 77 will maintain the respective members 66 and 76 against lateral movement with relation to the respective slides 55—56, under the stresses and strains exerted by the eccentric straps upon the respective members 66—76.

All of the operating parts for the slides 55 and 56 are, similar to the other forms of the invention, disposed entirely within the container 13, which in the preferred form of the invention, constitutes a portion of the crown of the press.

In the form of the invention shown in Figures 7 and 8, the portion of the press above the bed 86, is preferably constructed in the same manner as that disclosed in Figures 5 and 6, and the slides 55 and 56 are mounted and are reciprocated in the same manner. In Figures 7 and 8, however, there is disclosed a triple action press, the upper portion of the press being similar to the double action press, while a lower slide 87 is provided which operates beneath the work 88. In this form of the invention, there is provided what might be termed generally a base crown 89 disposed at the bottom of the press beneath the press bed, and this crown 89 is of a hollow construction to form a container 90 for lubricant. Journaled in suitable bearings 91, preferably supported by the walls of the container or base crown and also in a bearing 92 carried by a partition 93, is a shaft 94. Gears 95—96 are mounted upon the shaft 94, which may be either secured to the shaft 94 for rotation therewith, or loosely mounted upon the shaft.

The co-operating pairs of gears 95—96 have respectively secured thereto as an integral part thereof, eccentric sections 97—98, and eccentric straps 99—100 of integral construction encompass the respective eccentric sections 97—98. The respective extensions 101—102 of the eccentric straps are pivotally connected as at 103 with members 104. These members pass through bearings 105 which are preferably supported by the base crown 89 and have communication with the container 90. Packing 106 and a packing gland 107 are provided for each of the bearings. The members 104 are of substantial length and are connected to the bottom slide 87, preferably by means of nuts or collars 108 engaging threaded extremities 109 of the members 104 so that the members 104 and slide 87 may be relatively adjusted one with relation to the other in directions lengthwise of the longitudinal axes of the members 104.

The bearings 105, similar to the bearings 36 and 77, are of substantial length so that at all times during the cycle of reciprocation of the slide 87 and the members 104, the pivotal joint 103 will always be maintained within the confines of the outer ends of the respective bearings 105, with the result that the members 104 will not only be maintained parallel but the bearings 105 will at all times prevent lateral movements of the members 104 with respect to the slide 87 under the stresses and strains exerted by the eccentric and eccentric strap connection with the operating gears 95—96.

Any number of members 104 may be provided and a driving shaft or shafts 110 pass through the crown or container 89—90 and are journaled in bearings 111 carried by the container wall and a bearing 112 carried by the partition 93. Secured to the shaft 110 for rotation therewith are gears 113 which mesh with the respective gears 95—96 for imparting rotation thereto and a recipocation of the slide.

The operating mechanism for the lower slide 87 is disposed within the container 90 and is immersed in the lubricant therein, thereby obviating the necessity of providing separate lubricating ducts or channels leading to the various parts, at the same time materially reducing the cost of construction and maintenance.

In each of the forms of the invention the bearings for the respective members 29, 44, 66, 76 and 104 are here shown as being carried by and forming a portion of the crown of the press, either the upper or the lower crown, but it is to be understood that these bearings may form a part of the frame or may be otherwise provided, so as to hold the members which reciprocate therethrough against any sidewise or lateral movement under the stress or strain of the operating forces or resistance exerted by the work being operated upon. This will maintain the slides against tilting and also against edgewise movement at any point in the cycle of operation of the slides and will also relieve the slide of the lateral stresses and strains which would otherwise be exerted thereupon by the operating mechanism.

It will also be manifest that all of the operating parts will be contained within the hollow crowns or hollow portions of the press and immersed in the lubricant.

Furthermore, with this construction and with a welded steel frame, and with the operating mechanisms mounted in the manner herein disclosed, all of the stresses and strains of such operating mechanism, as well as the stresses caused by the resistance of the work being operated upon and directed against the ram, will be borne or sustained by the plates or members of the frame, and all of the welded joints or seams in the construction will be entirely relieved of such stresses and strains. The welded joints or seams will then serve only as a means for maintaining the parts of the frame structure and crown in assembled position.

While the preferred forms of the invention and the preferred manner of mounting and connecting the various parts have been herein shown and described, it is to be understood that various changes may be made in the details of construction and in the combination and arrangement and the mounting of the several parts, within the scope of the claims, without departing from the spirit of this invention.

What is claimed as new is:—

1. A metal working press embodying a frame, said frame embodying a crown, shaped to receive a lubricant, a slide, guiding means for the slide, operating means for the slide disposed within the lubricant holder, connecting means between the slide and the said operating means, said connection embodying a member connected at one end directly to the slide and operable through one wall of the lubricant holder, and a bearing for the portion of said member which moves through said wall, said bearing serving to maintain said member against lateral movement with respect to said slide.

2. A metal drawing press embodying a frame, said frame embodying a crown, shaped to receive a lubricant, a slide, guiding means for the slide, operating means for the slide disposed within the said container, connecting means between the slide and the said operating means, said connection embodying a member connected at one end directly to the slide and operable through one wall of the container, a bearing for the portion of said member which moves through said wall, said bearing serving to maintain said member against lateral movement with respect to said slide, and packing for the said bearing.

3. A metal drawing press embodying a frame, said frame embodying a crown, a slide, means for reciprocating the slide embodying an operating element, a member connected at one end with the slide, a connection between said element and the other end of said member and pivotally connected with the member, a guiding bearing for said member for maintaining the latter against lateral movement with respect to said slide, said pivotal connection being always maintained within the confines of that end of said bearing adjacent the slide, said crown shaped to receive a lubricant and within which container said operating element is disposed.

4. A metal drawing press embodying a frame, a plurality of slides mounted thereupon, actuating means individual to the slides for operating them, connections between the slides and their respective actuating means, each of said connections embodying a member connected at one end with the slide, a pivotal connection between the other end of each of said members and their respective actuating means, bearings for maintaining said members parallel and against lateral movement with respect to the slides, said frame embodying a crown, a portion of the crown being shaped to receive lubricant and in which container said actuating means is disposed.

5. A metal drawing press embodying a frame, a plurality of slides reciprocable towards and away from each other and operable on the top and bottom of the work, actuating means individual to the slides, members individual to and connected at one end directly to the slides, elements individual to the said members and pivotally connected to the other end of the respective members, a guide bearing for each of said members and for maintaining the said members against lateral movement with relation to their respective slides, portions of the frame being shaped to receive lubricant and in which containers the respective said actuating means are disposed.

6. A metal working press embodying a frame comprising a bed, uprights and a crown, a slide, guides for the slide mounted on the uprights, actuating means for the slide, a connection between said actuating means and said slide, said connection embodying a member connected at one end with the slide, and means other than the slide guides, carried by said crown, for guiding said member.

7. A metal working press embodying a frame comprising a bed, uprights, and a crown, a slide, guides for the slide mounted on the uprights, actuating means for the slide, embodying an actuator, a connection between said actuating means and said slide, said connection embodying a member connected at one end with the slide, a guide other than said slide guides for said member, disposed between the slide and said actuator, and functioning to relieve the slide from lateral strains exerted by said actuating means.

8. A metal working press embodying a frame comprising a bed, uprights, and a crown, a slide, guides for the slide mounted upon the uprights, actuating means for the slide, a connection between said actuating means and said slide, said connection embodying a member, said member having a threaded connection at one end with the slide, and means other than the slide guides, carried by said crown, for guiding said member.

9. In a metal working press embodying a frame comprising a bed, uprights, and a crown, a slide, guides carried by the frame for the slide, actuating means for the slide, a connection between the actuating means and said slide, said connection embodying a member connected at one end with the slide and having a portion cylindrical in cross section, and a bearing other than the slide guides and through which the cylindrical portion of the said member passes.

10. A metal working press embodying a frame comprising a bed, uprights and a crown, a slide, guides for the slide mounted on the uprights, actuating means for the slide, connections between the actuating means and said slide, said connections each embodying a member connected at one end wtih the slide, and means other than the slide guides carried by the crown, for guiding the said member.

11. A metal working press embodying a frame comprising a bed, uprights and a crown, a slide, guides for the slide mounted upon tbe uprights,

a plurality of actuating means for the slides embodying actuators, connections between each of the actuating means and the slide, said connections each embodying a member connected at one end with the slide, and guides other than the slide guides for said members, disposed between the slide and said actuators and functioning to relieve the slide from lateral strains exerted by said actuating means.

12. A metal working press embodying a frame, said frame embodying a crown, shaped to receive a lubricant, a slide, guiding means for the slide, operating means for the slide disposed within the lubricant holder, connecting means between the slide and said operating means, said connecting means embodying a member connected at one end to the slide and reciprocable longitudinally through a wall of the lubricant holder, and a lubricant seal carried by said crown, said seal encompassing said member.

13. A metal working press embodying a frame, said frame embodying a crown shaped to receive lubricant, a slide, guiding means for the slide, operating means for the slide disposed within the lubricant holder, connecting means between the slide and the said operating means, said connecting means embodying a plurality of members each connected at one end to the slide and reciprocable longitudinally through a wall of the lubricant holder, and lubricant seals carried by said crown, said seals encompassing the said members.

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