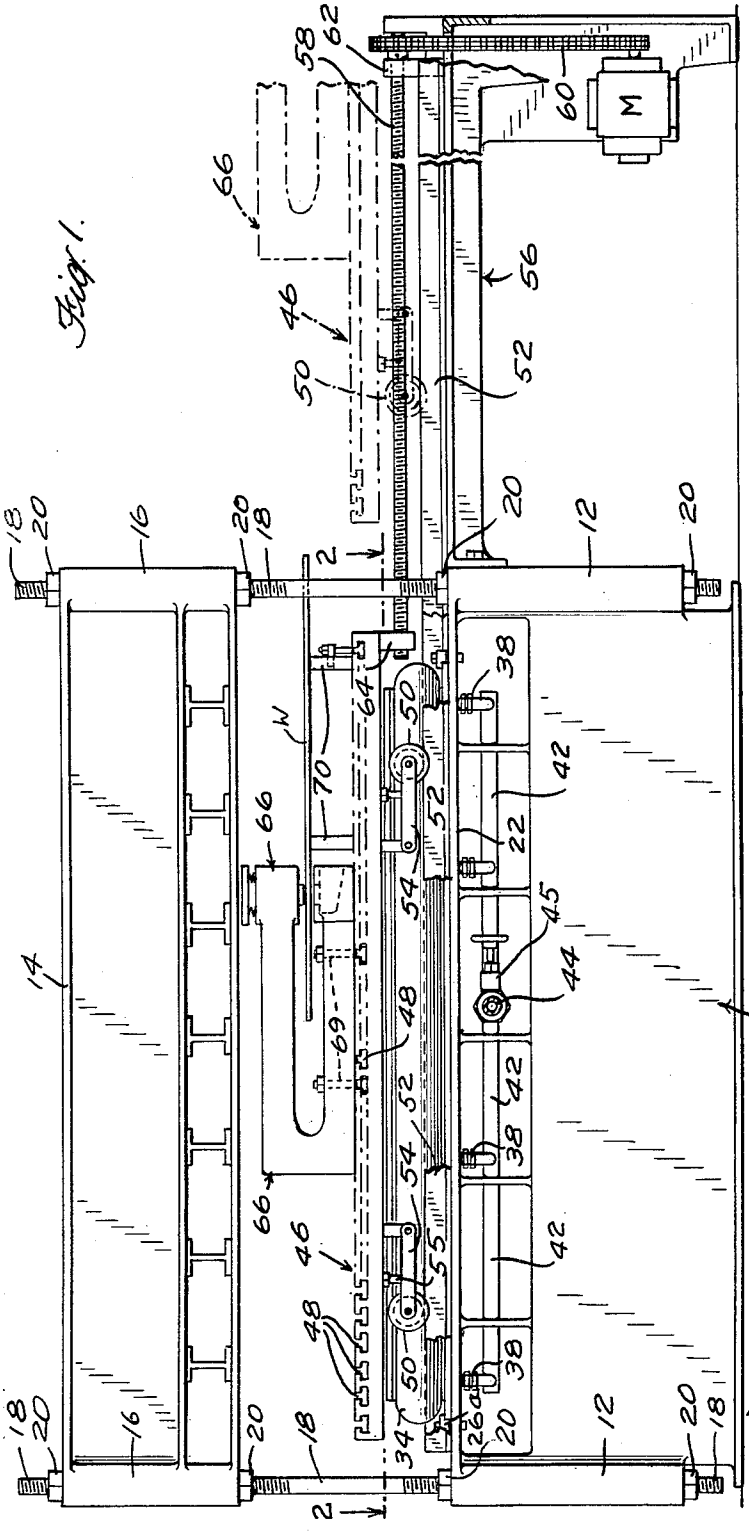
Oct. 26, 1965 A. E. ZINGONE 3,213,739

FLUID ACTUATED PRESS

Filed Sept. 9, 1963 3 Sheets-Sheet 1



Oct. 26, 1965 A. E. ZINGONE 3,213,739

FLUID ACTUATED PRESS

Filed Sept. 9, 1963 3 Sheets-Sheet 2

Fig. 2.

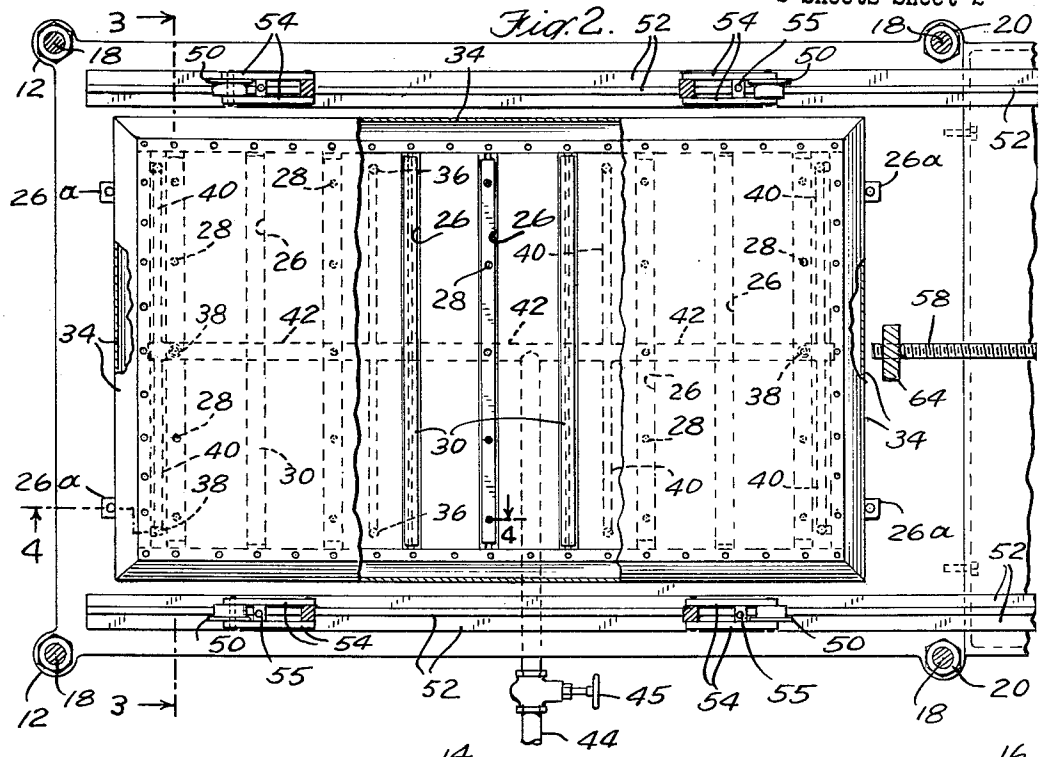
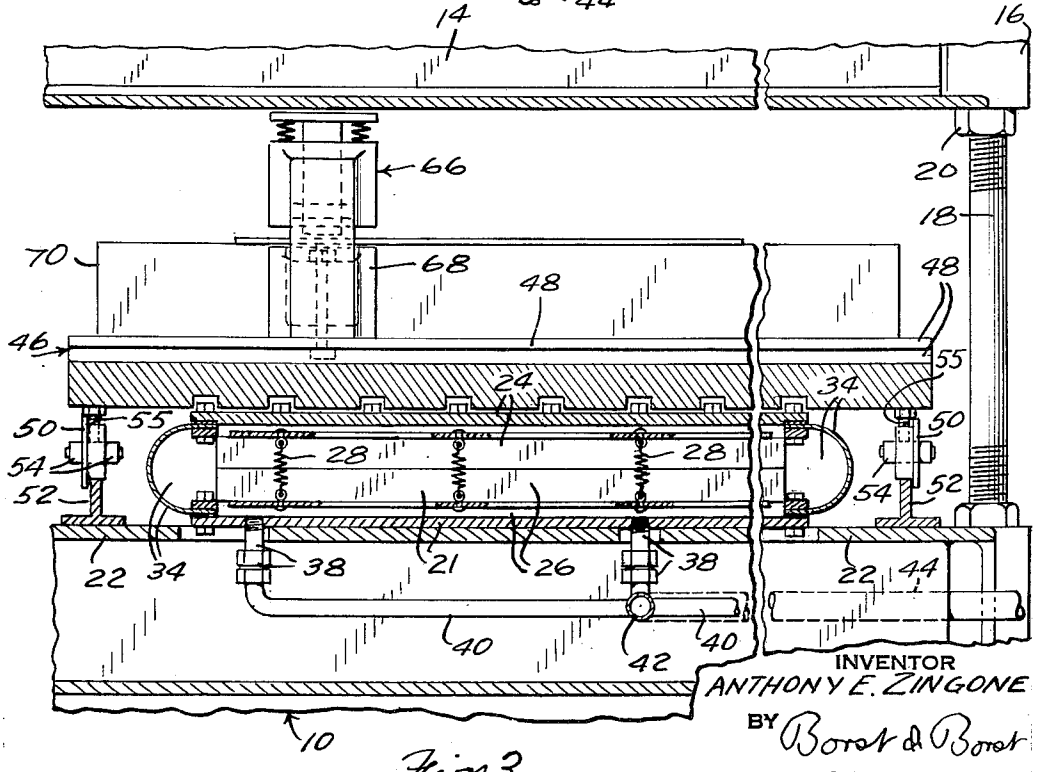


Fig. 3.



INVENTOR
ANTHONY E. ZINGONE
BY Borst & Borst
ATTORNEYS

Oct. 26, 1965 A. E. ZINGONE 3,213,739

FLUID ACTUATED PRESS

Filed Sept. 9, 1963 3 Sheets-Sheet 3

Fig. 5.

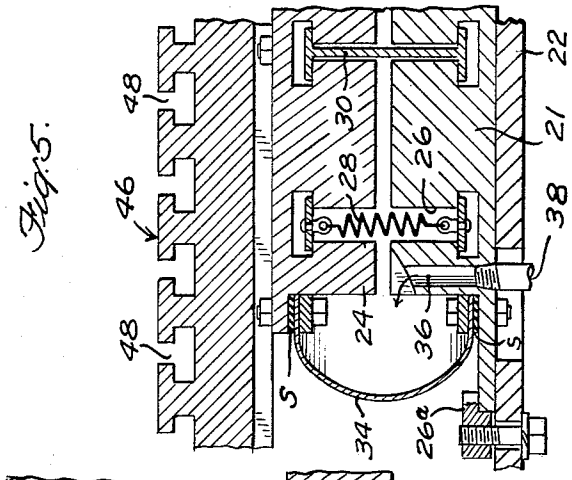


Fig. 6.

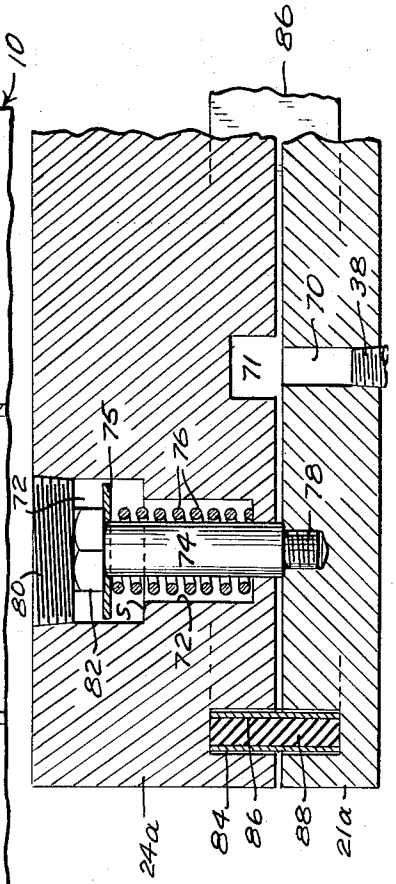
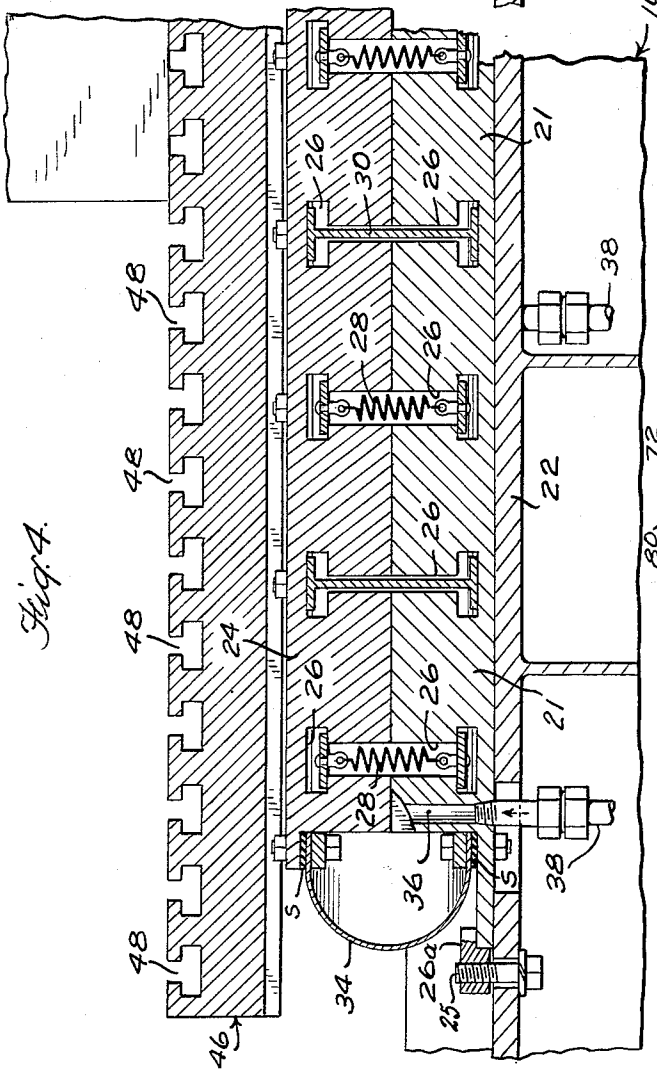


Fig. 4.



INVENTOR
ANTHONY E. ZINGONE
BY Borst & Borst
ATTORNEYS

United States Patent Office 3,213,739 Patented Oct. 26, 1965

3,213,739

FLUID ACTUATED PRESS

Anthony E. Zingone, Massapequa, N.Y., assignor to Neo-Ray Products, Inc., New York, N.Y., a corporation of New York

Filed Sept. 9, 1963, Ser. No. 307,648
4 Claims. (Cl. 83—563)

This invention relates to industrial presses operative by means of a fluid either liquid or gas.

One object of the invention is to provide a fluid actuated press the die supporting members of which will be under uniform stress in work load position regardless of the number, location or character of the die elements thus effectively minimizing any distortion, flexing or even possible rupture of these members. In general this is achieved by a mechanical feature of design which serves to insure uniform distribution under high fluid pressures of the load across the entire area of the members under stress conditions even though actual work is being performed at only one or two points on their operating surface.

One of the principal die support members, according to the invention, is a platen which is formed into two parts, one part being fixed to the base of the press and the second part being displaceable in the direction of the work. Fluid pressure is provided by a chamber formed internally of the platen or as a flexible joint on its periphery. The movable platen member is provided with internal limit stops disposed in slots located at frequent intervals within the platen which effectively eliminates the need for the usual platen reinforcement to prevent flexing and distortion under high stress.

Other objects and advantages of the invention may be apparent on reading the following specification which is taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is a side elevation of the press and die set-up table with certain parts broken away for clarity;

FIGURE 2 is a plan section taken on line 2—2 of FIGURE 1;

FIGURE 3 is a transverse section on enlarged scale taken on line 3—3 of FIGURE 2;

FIGURE 4 is a longitudinal section on enlarged scale taken on line 4—4 of FIGURE 2 showing a detail of the fixed and movable platens;

FIGURE 5 is a section similar to FIGURE 4 with the movable platen in operative position;

FIGURE 6 is a section showing a modification of the invention.

Referring to the drawings, it is seen that the press has a base **10** having vertical ears **12** at each corner and a top frame member **14** also having corner ears **16**. Posts **18** are disposed in upper and lower complementary ears and are screw threaded to receive clearance adjusting, hexagonal nuts **20** above and below each ear. It may be seen that the nuts **20** on being vertically positioned by turning on the posts will cause the base and frame member to separate or draw closer to each other thus providing greater or lesser clearance between these members and certain fixed elements below described which are disposed therebetween.

As shown in FIGURE 4 a lower or fixed platen **21** is supported atop the base **10** being immediately carried on a base plate **22** which by means of bolts **25** extending therethrough and clamps **26***a* partially overlying lateral extensions of the platen **21** serves to fixedly retain the latter on the base. Movable platen **24** is disposed on top the lower platen with the sides flush. Each platen is provided with communicating T slots **26** in which there are disposed alternate tension springs **28** and platen guide and stop bars **30**. The T slots extend from side to side as shown in FIGURE 3 and communicate with peripheral

air chamber **34** fabricated of flexible sheet steel or the like. The air chamber is semi-circular in cross section with one side thereof connected by screw attachment to lateral extensions on the movable platen **24** and its other side similarly connected to the lateral extensions on the lower platen. Seals S are provided between the platen extensions and the chamber which are made somewhat tighter, as it may be appreciated, as the chamber is outwardly flexed on separation of the two platen halves.

The lower platen **21** is provided preferably with an air passage **36** at four points proximate two opposing sides, see FIGURE 2, such passages communicating with the flexible air chamber **34** and a source of constant fluid pressure by vertical tubes **38**, transverse pipes **40**, a central, longitudinal pipe **42** and a pipe **44** controlled by a valve **45**.

A die carriage **46** having transverse T slots **48** formed therein is normally fully supported by wheels **50** which are adapted to run on tracks **52** carried by the base plate **22**. The wheels **50** are supported at the end of pivot arms **54** which are pivotally connected to vertically displaceable links carried by the die carriage **46** and adjustable stops **55** which limit the upward movement of the arms **54**.

The tracks **52** extend the length of the base **10** and also that of table **56** which is used to support the die carriage when the dies are being positioned thereon during set up. To this end there is provided a carriage screw **58** which is axially turned by motor M through drive chain **60**. The screw **58** is supported centrally underneath the carriage by a bearing block **62** mounted at one end of the table **56** and in the threaded aperture of a member **64** depending from one end of the carriage **46**.

The dies may be of any conventional type and, as shown, comprises a horizontal U shaped member having flexible arms carrying at their free end upper and lower dies **66** and **68**, respectively. Secured to the lower arm is a pair of screws **69** the heads of which are adapted to be disposed in any one of the T slots **68** in the carriage **46** for longitudinal positioning of the dies and to slide within the slots for transverse positioning for a lateral set up. As mentioned above, the positioning of the die elements is effected as desired when the die carriage has been moved out on the table **56** for set up.

In operation a sheet metal work piece W is placed between the die elements and supported on the upstanding elements **70** on the carriage. When the fluid is admitted to the chamber **34** and thence to the transverse T slots formed internally of the platens, the latter separate as the chamber itself is flexed until the stop bars **30** strike the bottom and top, respectively of their longitudinally formed slots, see FIGURE 5, at which point the carriage **46** has been raised so as to depress the upper die element **66** so as to punch, for example, a selectively designed and located cut out in the work piece W. When the fluid pressure is turned off the internal springs **28** assist in returning the upper platen to its normal position. However, when liquid is the actuating fluid, the platen may be returned to its original position by evacuation with a pump to eliminate thereby the necessity of springs.

In the modification shown in FIGURE 6, fluid is introduced directly into internal passage **70** within the lower, fixed platen **21***a* from a source not shown. An annular fluid chamber **71** in the displaceable upper platen **24***a* receives the fluid from the passage **70**. In this version, there is provided a plurality of bores **72** in each of which there is disposed a shoulder bolt **74** having on one end a metal stop washer **75** which on upward movement of the platen **24***a* strikes shoulder S formed in the bore **72**. Preferably a compression spring **76** is provided in each slot extending between the washer and the bottom of the slot to assist the return of the platen to the position shown

in FIGURE 6. The other end of the bolt extends through a central aperture in the bottom of each bore, there being a threaded extension member **78** depending from the bolt which is screwed into the fixed platen **21***a* to insure relative movement between the bolt and the platen **24***a* when the latter is displaced. At the top of each slot is a screw plug **80** which rests on spacer head **82** of the bolt which retains the metal washer **74** in each slot to provide a slight spacing between the platen members **21***a* and **24***a* in their closed or normal position.

Proximate the periphery of the platen is formed a pair of complementary annular grooves within which are disposed spaced apart and annular metal shields **84** and **86**. In this space between the shields is disposed an elastic material **88**, such as rubber "neoprene" or "teflon" which is subject to a natural elongation greater than maximum displacement of platen **24***a* serving as thus confined in the annular slot as an effective pressure seal for the fluid.

In either embodiment of the invention as herein above described, it is important to note that the internal limit stops are located at frequent intervals within the platen members, the number depending on platen thickness and maximum pressure, to eliminate reinforcement of the members which would otherwise be necessary to prevent their flexing and possibly permanent distortion.

Other modifications of the invention may be effected by persons skilled in the art without departing from the scope and principle of invention as defined in the appended claims.

What is claimed is:

1. In a fluid actuated press a lower fixed member, a moveable member overlying said fixed member, there being provided internal slots in said members, said slots being shouldered, stop elements disposed in said slots adapted to bear on the shouldered portions of said slots and a flexible fluid chamber communicating with said slots, one part of said chamber being secured to said fixed member and another part being secured to said moveable member.

2. In a fluid actuated press as defined in claim **1**, member return springs disposed in said slots.

3. A fluid actuated press a lower fixed member, a moveable member overlying said fixed member, there being provided internal slots in said members, said slots being shouldered, stop elements disposed in said slots adapted to bear on the shouldered portions of said slots and a flexible fluid chamber communicating with said slots, one part of said chamber being secured to said fixed member and another part being secured to said moveable member, a die carriage supported on said moveable member, an upper frame member supported over said carriage, a die removably secured to said carriage and having an upper die element arm adapted to strike said frame member as the press is opened.

4. A fluid actuated press as defined in claim **3** wherein said carriage is T slotted with a lower die element arm of said die disposed in a selected pair of T slots in said carriage for transverse positioning therein.

References Cited by the Examiner

UNITED STATES PATENTS

2,363,779	11/44	Duffy	100—269
2,717,421	9/55	Beeson	100—269
2,869,173	1/59	Van Hartesveldt	100—269
2,997,083	8/61	Pfefer	100—269
3,111,100	11/63	Georgeff	100—299
3,134,350	5/64	Danly	100—299

FOREIGN PATENTS

467,952	6/37	Great Britain.

WILLIAM W. DYER, JR., *Primary Examiner.*

ANDREW R. JUHASZ, *Examiner.*