Sept. 29, 1953 E. A. BURNS 2,653,661

PUSHER ATTACHMENT FOR PRESSES

Filed June 18, 1951 3 Sheets-Sheet 1

FIG. 1

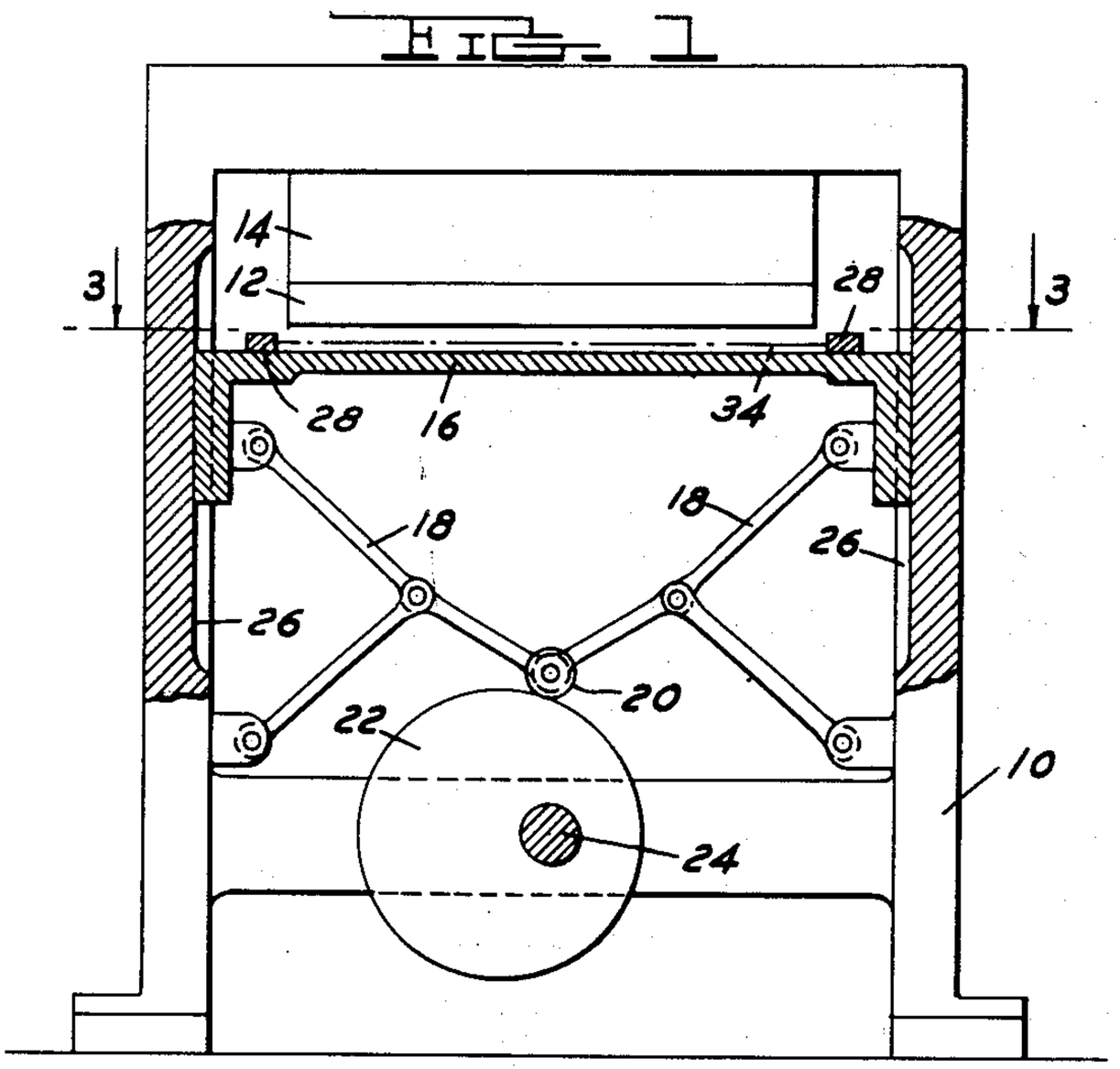
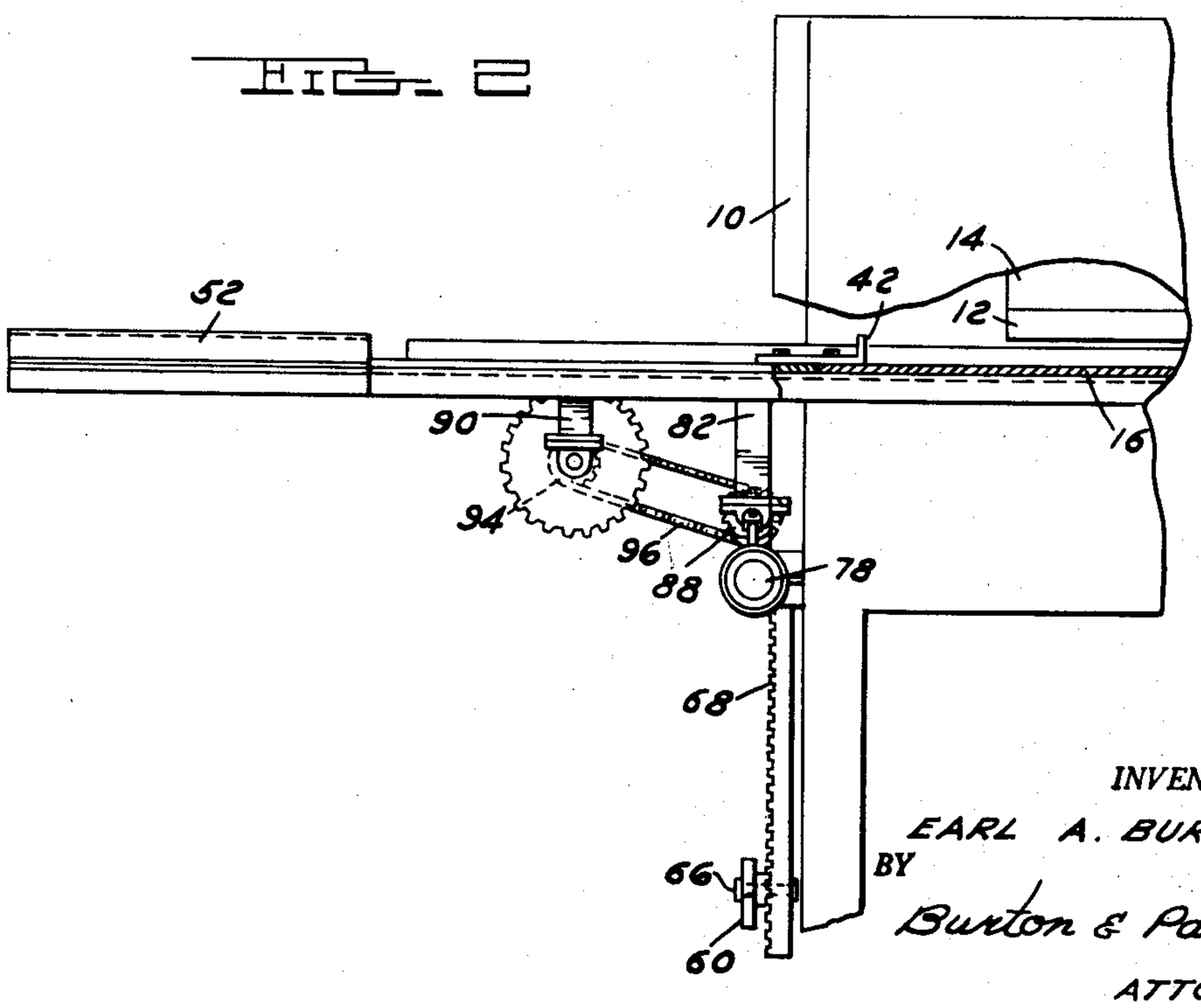


FIG. 2



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Filed June 18, 1951 3 Sheets-Sheet 2

FIG. 3

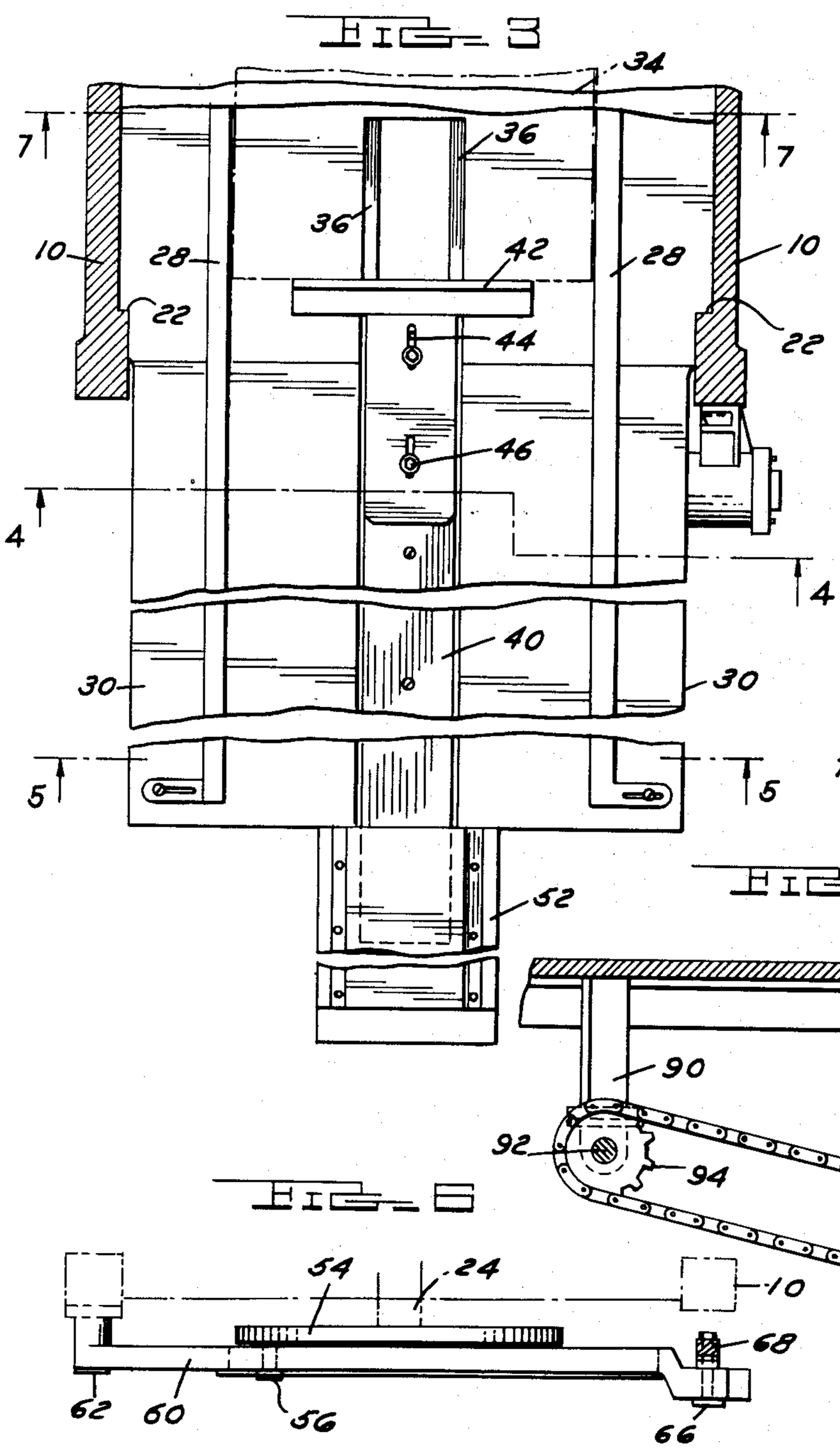

FIG. 8

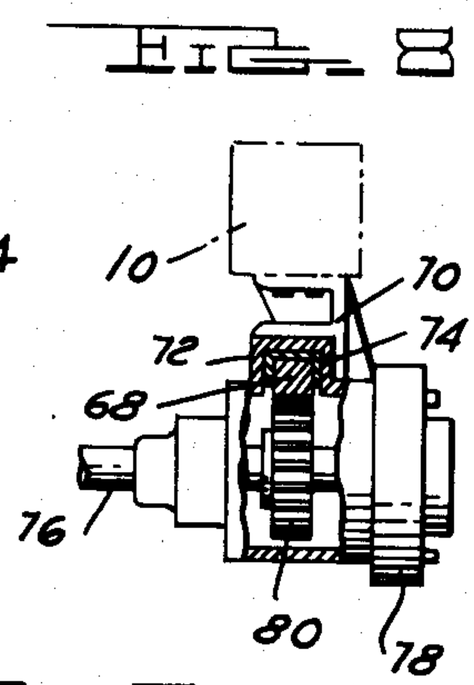

FIG. 7

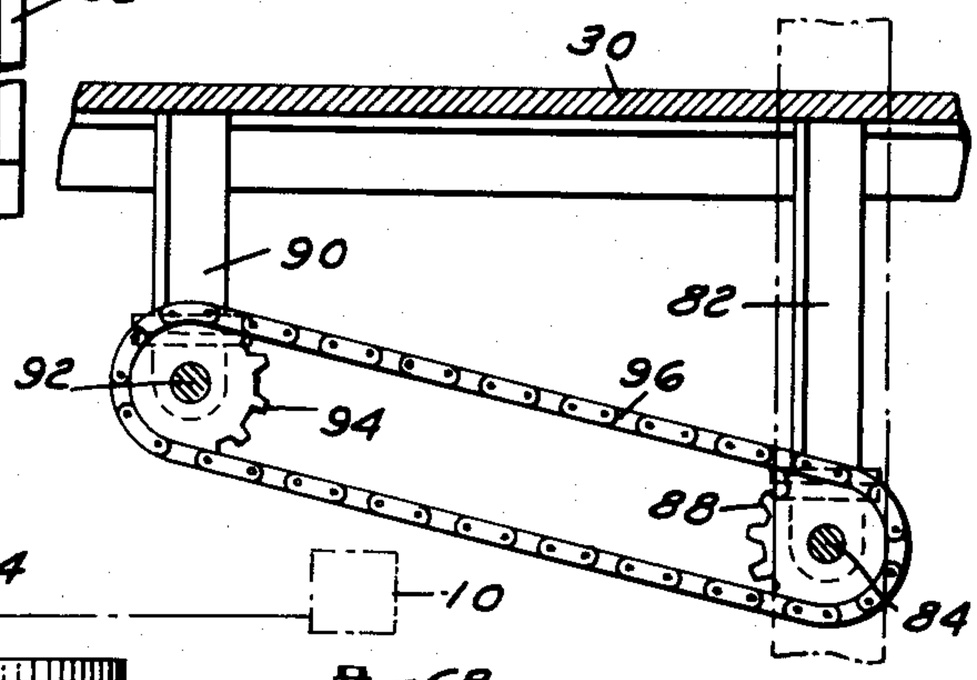

FIG. 6

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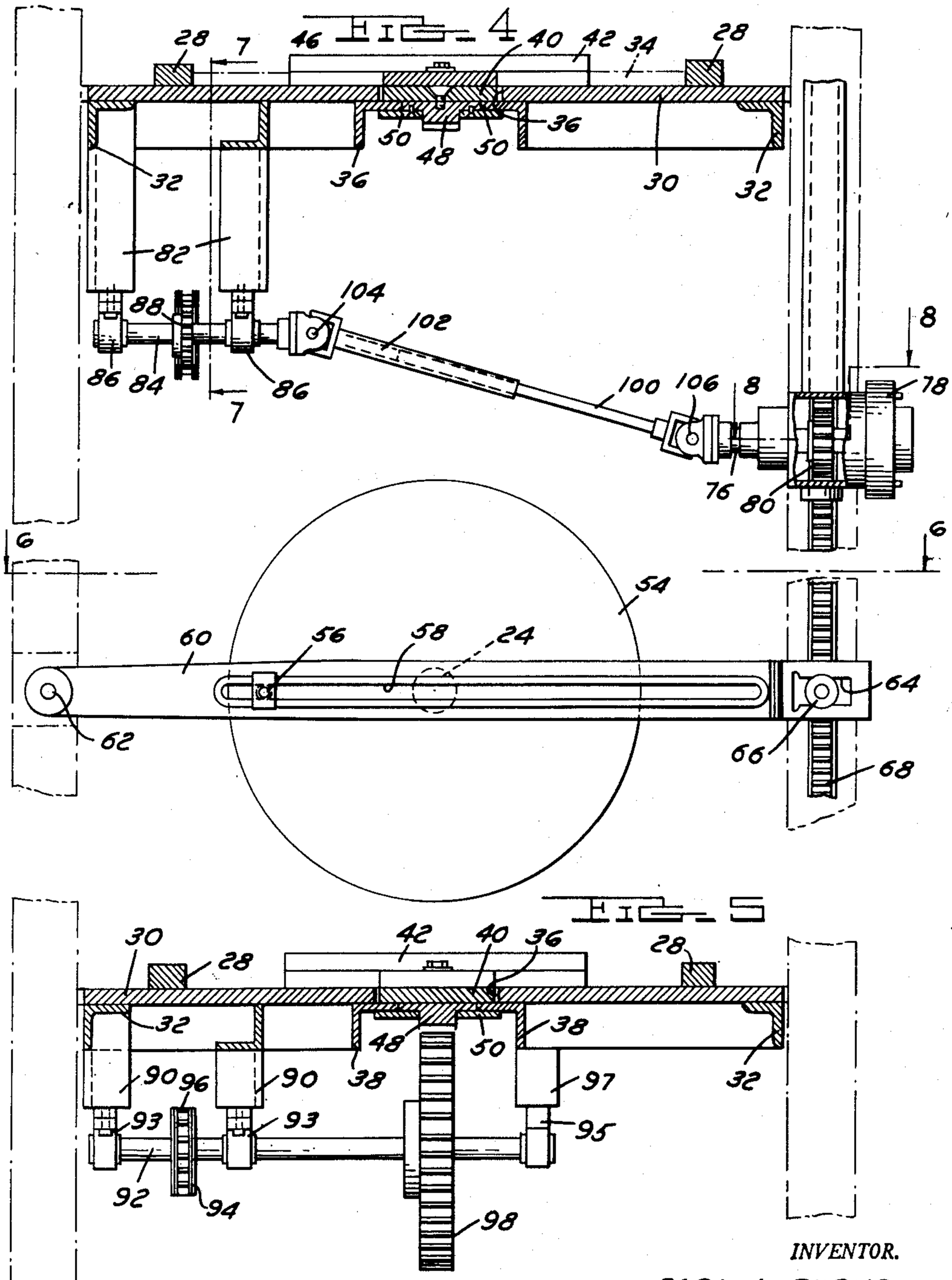
Filed June 18, 1951 3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,653,661

PUSHER ATTACHMENT FOR PRESSES

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Application June 18, 1951, Serial No. 232,140

5 Claims. (Cl. 164—48)

1

This invention relates to improvements in presses and particularly press mechanism adapted for the cutting of fibre board sheets or the like.

An object is to provide an improved press or attachment therefor coupled with the press to be coordinated in movement therewith and designed to move a sheet of material into the press to be acted upon thereby and to remove from the press the sheet of material which has been acted upon by the press.

Heretofore it has been common practice in the cutting or forming of fibre board sheets or the like in a press for the workman to place the sheet within the press in the proper location by hand. The presses are provided with electric control devices to institute and stop their movement so that the sheet of material to be worked upon can be placed within the press during the pauses in press operation. It is not uncommon, however, for the press operators to run them on the fly; that is, the press runs continuously and the operator places a sheet to be acted upon in the press during the opening movement thereof and at the same time removes the sheet which has been acted upon by the press therefrom. To do this the hands of the operator enter the press while the die members are spaced apart but moving and inattentive or careless operation may result in serious injury to the operator.

The present invention relates to the provision of reciprocating pusher mechanism associated with the press and coupled therewith to function in sequence with the functioning of the press. This pusher mechanism comprises a part which is supported to advance a sheet of material from a table adjacent to the press onto one of the pressure members of the press during the period of time that the press is open. The construction and functioning is such that as the sheet of material to be acted upon is advanced over the table and onto the portion of the press to receive it the sheet of material which has been acted upon in the press is moved out of the press. This mechanism functions in such a manner that it is unnecessary for an operator to place his hands within the press and thereby eliminates this possibility of injury.

This invention is here illustrated as associated with press mechanism wherein the upper die member is stationary and the lower pressure member is supported to be raised and lowered with respect to the cooperating die member to act upon the sheet of material supported therebetween. The lower pressure member is provided with a sheet supporting extension which is laterally offset the upper die member. This extension is adapted to support a sheet of material placed thereon by the operator. This extension forms a part of the lower pressure member and reciprocates therewith.

2

A pusher structure is provided which is supported to be moved over the extension to advance a sheet of material therefrom onto the lower pressure member to be raised thereby and brought into contact with the upper die member. This pusher mechanism is coupled with the power drive for the movable pressure member so that the pusher structure is operated in timed sequence with the reciprocation of the lower pressure member.

In the operation of a press equipped with this invention it is therefore only necessary that the attendant place the sheet of material to be received in the press upon the extension of the lower pressure member. Such placement does not require placing the hands of the attendant at any time between the pressure members. From the extension the pusher structure takes charge and moves the sheet onto a lower pressure member by which it is raised and lowered to be acted upon by the die.

More specifically, the construction and operation of the device will appear from the specification and drawings wherein:

Fig. 1 is a front elevation partly in section of a press provided with my invention;

Fig. 2 is a fragmentary side elevation of the press;

Fig. 3 is a horizontal section taken on the line 3—3 of Fig. 1 showing the lower pressure member and the extension in plan;

Fig. 4 is a vertical sectional view taken on the line 4—4 of Fig. 3;

Fig. 5 is a vertical sectional view taken on the line 5—5 of Fig. 3;

Fig. 6 is a horizontal sectional view taken on the line 6—6 of Fig. 3;

Fig. 7 is a vertical section taken on the line 7—7 of Fig. 4;

Fig. 8 is a horizontal sectional view taken on the line 8—8 of Fig. 4.

The press structure itself with which my invention is associated is conventional and is illustrated and described merely in so far as is necessary to illustrate the invention.

In the figures of the drawing the press frame is indicated generally by the numeral 10. It is provided with an upper die member or pressure member 12 shown in Fig. 1 as supported upon a

spacer block 14. In the same figure, there is a lower pressure member 16 which is supported to be raised and lowered by conventional toggle linkage indicated generally as 18. Such linkage includes a roller 20 adapted to travel over a power driven eccentric 22. The eccentric is shown as mounted upon a shaft 24 which may be driven from any suitable power means. It is understood that the lower pressure table is guided in its raising and lowering by guides 26 on the stationary frame. Figs. 1 and 3 show such guides. The pressure table is provided with stock guide bars 28. These guide bars may be secured to the pressure table 16 at such distance apart as is desired so as to receive therebetween the particular width of sheet material being acted upon in the press. Fig. 3 shows these guide bars as mounted for adjustment.

The lower pressure member or table 16 is provided with a lateral extension 30. This extension 30 is immediately adjacent to the table 16 and substantially flush therewith. The extension may be connected with the table by angle members 32 as shown particularly in Figs. 4 and 5 so that the extension rises and falls with the table. The guide bars 28 hereinbefore mentioned extend from the table over the extension as illustrated in Fig. 3 and are secured thereto. A sheet of material such as fibreboard 34 may be placed upon the extension and advanced therefrom onto the table 16 to be raised by the table and urged against the die member 12.

Pusher structure is provided to move the stock from the extension on to the table. This pusher structure is driven in timed sequence with the reciprocation of the table. The invention relates to the provision of this pusher mechanism in a press of the general character shown and the adaptation of the press thereto. The table and extension are shown as provided with a guideway within which a pusher plate is supported to be moved lengthwise therethrough.

The extension is shown as cut away at 36 in Figs. 4 and 5 providing a slot therethrough. Directly below this slot is disposed a pair of angular rails 38. Note Figs. 4 and 5. These rails form bottom flanges on opposite sides of the slot and slidably support a bar 40 which carries the pusher plate 42. The pusher plate 42 may be adjustably secured to the bar as shown in Fig. 3. In such figure the plate is illustrated as provided with slots 44 and screw studs 46 extend through these slots into the bar 40 to secure the plate at adjusted positions therealong.

This bar 40 carries a rack 48. This rack is provided with guide plates 50 fastened thereto. These plates 50 underlie the angular rails 36 which rails are secured to the table so as to maintain the pusher structure in place for reciprocating movement.

In Fig. 3 the extension plate 30 is shown as provided with a casing or cover portion 52 which extends rearwardly therefrom and forms an enclosure for the end of the pusher structure. This casing is provided to prevent injury to the attendant by the pusher itself.

The shaft 24 upon which is fixed the eccentric 22 also has a wheel 54 fixed thereto to rotate therewith. This wheel is provided with a pin 56 which extends through a slot 58 in an arm 60 which arm is pivoted to the frame of the press at 62. This constitutes a slotted arm and crank pin arrangement. As the pinion travels through the slot into the arm the arm swings. This

structure is also shown in Fig. 6. The arm raises and lowers in its swing as the wheel 54 is rotated.

The opposite end of the arm 60 is provided with a slot 64 within which is disposed a pin 66 which pin is carried by a rack 68. Rack 68 is supported by the frame of the press as shown in Figs. 2, 4 and 8 for raising and lowering. Fig. 8 shows a bracket 70 secured to the frame 10 of the press. This bracket carries a channel member 72. Within the channel 72 is a bearing channel 74 and within the channel 74 the rack 68 is slidably mounted.

A driving connection is provided between the rack 68 and the pusher structure. This driving connection includes a stub shaft 76 journaled in a housing 78 upon suitable bearings. Upon this shaft 76 is fixed a pinion 80 which pinion meshes with the rack and is rotated thereby as the rack is reciprocated. At the opposite side of the press a pair of brackets 82 depend from below the extension 30. These brackets support a stub shaft 84 which is journaled at its opposite ends within bearings 86, all as shown in Figs. 4 and 7. Upon this shaft 84 is fixed a gear 88 to rotate with the shaft. A pair of brackets 90 likewise depend from the extension 30. A shaft 92 is supported within suitable bearings 93 by these brackets 90. A gear 94 is fixed on shaft 92 to rotate therewith. This gear 94 is driven from the gear 88 by a chain drive 96 as shown in Figs. 2 and 7.

The shaft 92 extends along underneath the pusher plate and is further supported by a bearing 95 carried by a bracket 97 likewise depending from the table extension 30 as shown in Fig. 5. Upon this shaft 92 is mounted a gear 98 which gear meshes with the rack bar 48 so as to drive the pusher bar 40 as shown particularly in Figs. 2, 4 and 5.

The shaft 84 which carries the gear 88 which drives the chain 96 is coupled with the shaft 76 upon which the drive pinion 80 is fixed by extensible driven shaft means shown particularly in Fig. 4. This shaft means comprises end portions 100 and 102 which are telescoped together to rotate as one. The outer ends of these end portions have a universal driving connection of a conventional character as shown at 104 and 106 with the shafts 84 and 76 respectively.

It is apparent therefore that as the lower pressure member 16 is raised and lowered toward and away from the die member 12 that the extension table 30 is likewise raised and lowered therewith. The power driven shaft 24 which raises and lowers the table also reciprocates rack 68 in timed sequence therewith. This rack 68 through the linkage hereinabove described reciprocates the pusher plate 42. As the pusher plate reciprocates over the extension table it moves a sheet of material placed upon the extension table ahead of the pusher plate on to the pressure table 16.

This functioning of the pusher structure is so coordinated in timed relationship with the functioning of the movable member of the press that as the sheet of material to be acted upon is advanced by the pusher it shoves the sheet of material which has been acted upon in the press off the lower pressure member. The pusher plate is so positioned upon the pusher bar that it serves to move the sheet of material to be acted upon to the exact point on the movable table desired during the press operation. The friction of the sheet material as it is shoved on to the table is sufficiently great so that the sheet of material stops at the position to which it is moved by the

pusher plate. The pusher plate therefore not only advances the sheet of material to be acted upon on to the lower pressure member but positions it thereon at the desired point to be acted upon.

Due to the pusher mechanism moving the sheet material on to the movable pressure member and positioning it thereon, it is unnecessary for the attendant of the machine to insert his hands thereinto at any time. The machine may therefore be operated safely. The machine also will function accurately because the pusher plate will at all times position the sheet of stock at the desired point.

What I claim is:

1. In a press provided with upper and lower cooperating pressure members, said lower pressure member being supported for movement toward and away from the upper pressure member, said lower pressure member provided with an extension adapted to support a sheet of material, pusher structure supported for travel over the extension to advance a sheet of material therefrom on to the lower pressure member, power means coupled with the lower pressure member to reciprocate it, driving mechanism connecting the pusher structure with the power means to actuate the pusher to move a sheet of material from the extension onto the lower pressure member during the time said lower pressure member is withdrawn away from the upper pressure member.

2. In a press provided with upper and lower cooperate pressure members, the lower pressure member being supported for movement toward and away from the upper member and provided with an extension adapted to support a sheet of material, said extension being substantially flush with the lower member and laterally offset the upper member and connected with the lower member to move therewith, pusher structure supported for a sliding movement over said extension toward and away from the adjacent pressure member to advance a sheet of material from the extension onto the lower pressure member, power means coupled with the lower member to raise and lower the same, mechanism coupling the pusher with the power means including a rack supported for reciprocation in timed sequence with the lower pressure member, and a pinion supported to be driven by said rack and an extensible driving connection intermediate said pinion and pusher structure.

3. In a press provided with upper and lower cooperating pressure members, the lower pressure member being supported for movement toward and away from the upper member and provided

with an extension adapted to support a sheet of material, said extension being substantially flush with the lower member and laterally offset the upper member and connected with the lower member to move therewith, pusher structure supported for sliding movement over said extension to advance a sheet of material from the extension onto the lower member, power means coupled with the lower member to raise and lower the same, a rack coupled with the power means to be reciprocated thereto, a pinion supported to be driven by said rack, rack and gear means coupled directly with the pusher to reciprocate it, and driving mechanism including an extensible shaft extending between said pinion and said rack and gear means to reciprocate the pusher.

4. In a press provided with upper and lower pressure members, a lower pressure member supported for movement toward and away from the upper pressure member and provided with a lateral extension substantially flush therewith and adapted to support a sheet of material for movement therefrom onto the lower pressure member, power means coupled with the lower pressure member to raise and lower the same, said lower pressure member and extension provided with a guideway, a pusher supported for reciprocation through the guideway over the extension to advance a sheet of material therefrom onto the lower pressure member, a rack supported for reciprocation in timed sequence with the raising and lowering of the lower pressure member, a pinion supported to be driven by said rack, said pusher provided with a rack bar, a gear coupled with the rack bar to reciprocate the same, driving mechanism including an extensible shaft coupling the pinion with the gear to drive the rack bar to reciprocate the pusher in timed sequence with the raising and lowering of the lower pressure member.

5. The structure as defined in claim number 1 characterized in that the extension is so supported and so coupled with the lower pressure member as to be raised and lowered therewith and the driving mechanism including means operable to maintain the driving connection during such raising and lowering.

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