Nov. 17, 1936. C. B. COTTRELL, 3D 2,061,394

MOTIVE FLUID DRIVE FOR RECIPROCATING ELEMENTS

Original Filed June 21, 1932 2 Sheets-Sheet 1

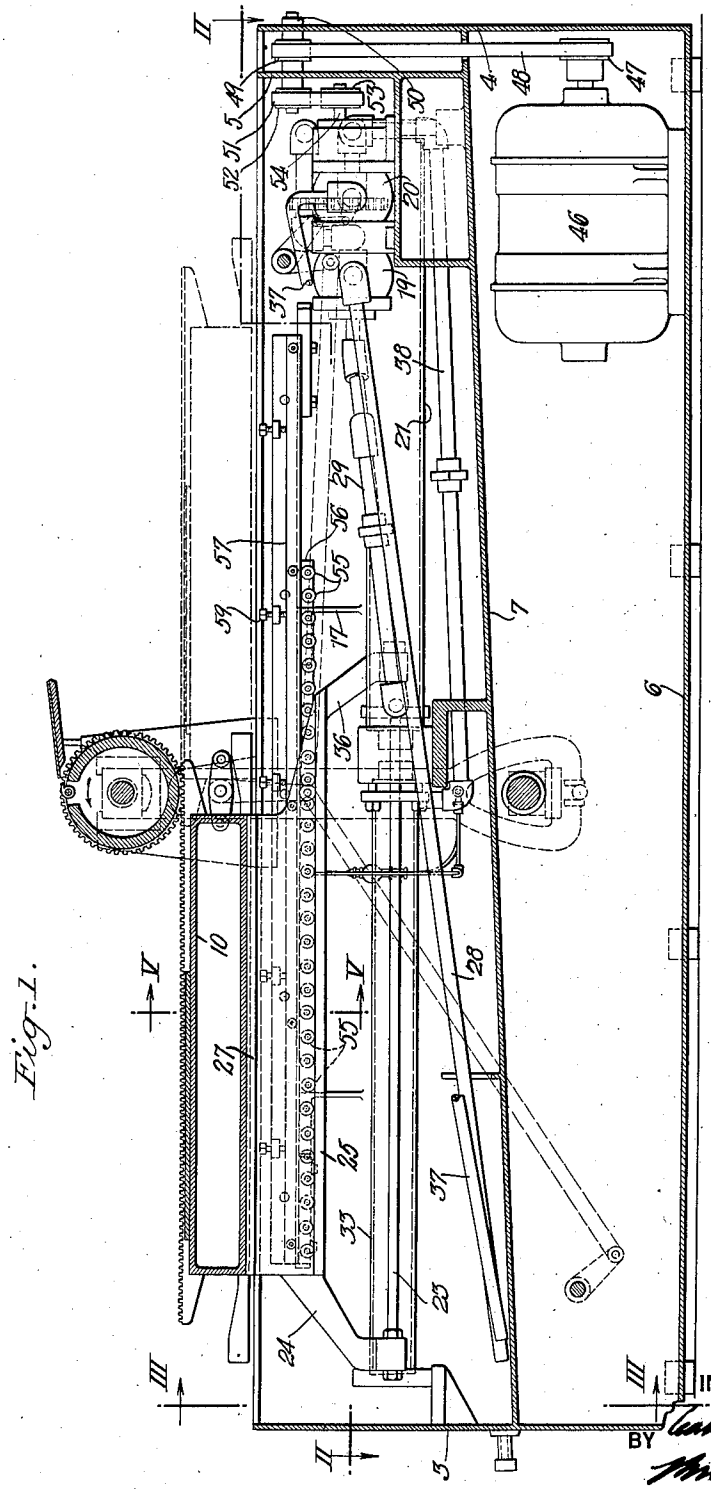


Fig. 1.

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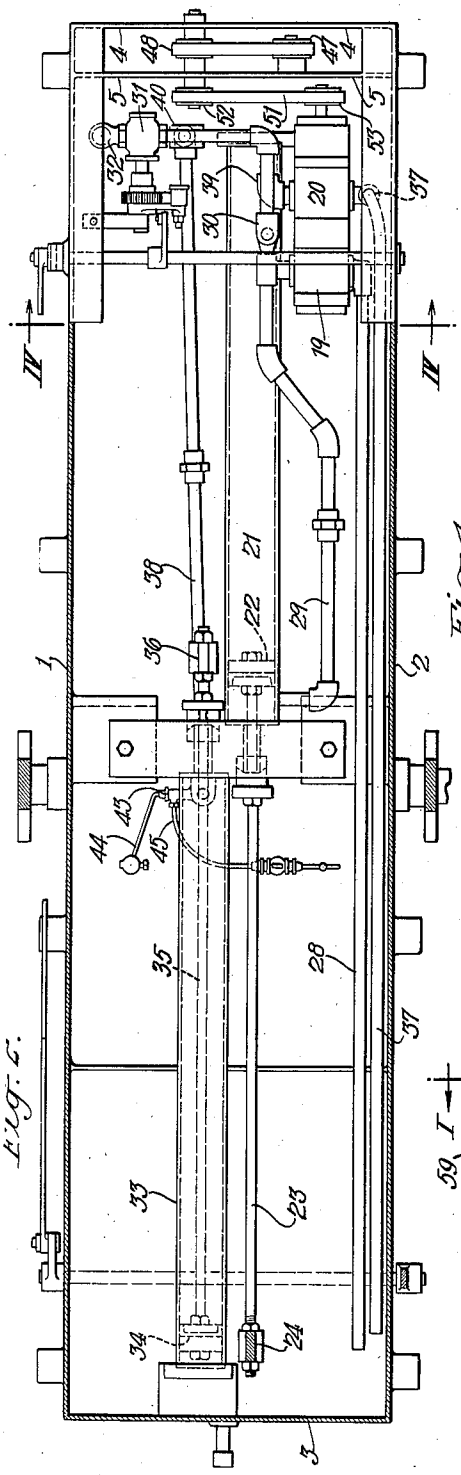


Fig. 5.

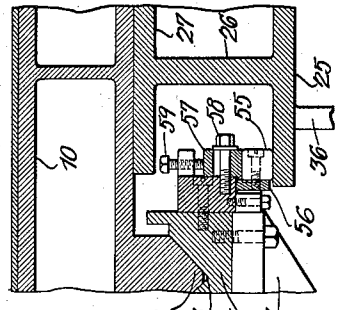


Fig. 4.

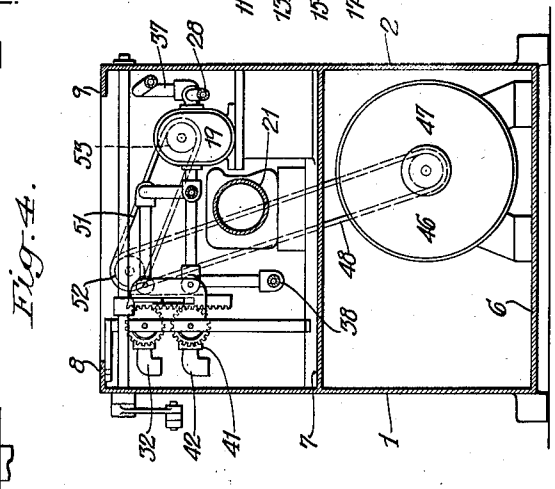
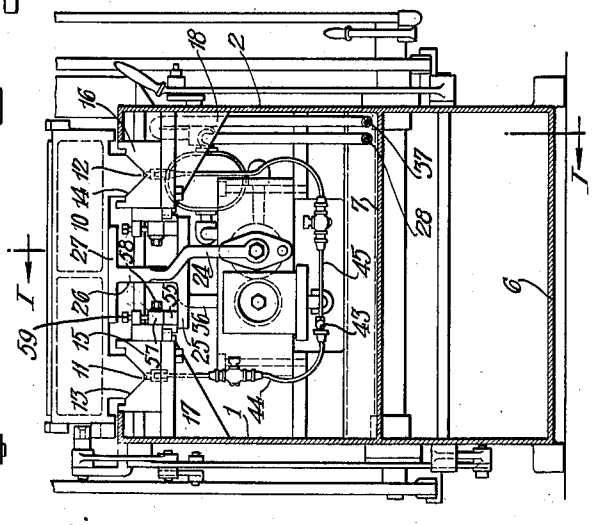


Fig. 3.



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UNITED STATES PATENT OFFICE

2,061,394

MOTIVE FLUID DRIVE FOR RECIPROCATING ELEMENTS

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Original application June 21, 1932, Serial No. 618,479. Divided and this application December 24, 1932, Serial No. 648,820

2 Claims. (Cl. 308—6)

My invention is directed to that type of machine in which motive fluid units are employed for reciprocating an element, such for instance as the bed of a bed and cylinder printing press.

The object of my invention is to provide a novel guide for steadying the reciprocating bed in its movements and for preventing the bed from lifting from its bearings, said guide being immersed in the motive fluid contained in the supply tank.

I have chosen to illustrate my invention in connection with a bed and cylinder printing press but it will be understood that the invention is applicable to machines of various kinds wherein an element is to be reciprocated by motive fluid pressure.

A practical embodiment of my invention is represented in the accompanying drawings, in which:

Fig. 1 represents a vertical longitudinal section through a reciprocating bed and cylinder printing press embodying my invention, said section being taken in the plane of the line I—I of Fig. 3, looking in the direction of the arrows;

Fig. 2 represents a horizontal section taken in the planes of the line II—II of Fig. 1, looking in the direction of the arrows;

Fig. 3 represents a vertical cross section taken in the plane of the line III—III of Fig. 1, looking in the direction of the arrows;

Fig. 4 represents a vertical cross section taken in the plane of the line IV—IV of Fig. 2; looking in the direction of the arrows; and

Fig. 5 represents a detail vertical cross section on an enlarged scale taken in the plane of the line V—V of Fig. 1.

The printing press base is shown as comprising two longitudinally disposed side walls 1 and 2, an end wall 3, outer and inner adjacent spaced end walls 4 and 5, and lower and upper spaced bottom walls 6 and 7. The upper edges of the side walls 1 and 2 may be turned inwardly to form flanges 8 and 9.

The upper bottom wall 7 and the inner end wall 5 of the base together with the side walls 1 and 2 and the end wall 3 form a supply tank containing the motive fluid within which the cylinder and other parts of the machine to be hereinafter described, are immersed. The upper bottom wall 7 is preferably inclined downwardly toward the end wall 3 of the tank.

The reciprocating bed 10 is provided with the usual tapered runners 11 and 12 fitted to slide in the flaring grooves 13 and 14 of longitudinally disposed tracks 15 and 16 supported by sets of brackets 17 and 18 projecting inwardly from their respective side walls 1 and 2 of the base within the motive fluid supply tank.

The means which I have shown for utilizing a motive fluid, such for instance as oil, for reciprocating the bed 10 is constructed, arranged and operated as follows:

A motor driven pump comprising two alternately operating motive fluid pumping units 19 and 20 is employed, one unit for driving the bed in one direction and the other unit for driving the bed in the opposite direction.

The longitudinally disposed cylinder 21 is fixedly mounted within the tank below the reciprocating bed 10, the piston 22 having its rod 23 attached to an arm 24 projecting downwardly from one end of a fin of I-beam construction depending from the bed, which fin comprises oppositely projecting bottom flanges 25 and oppositely projecting top flanges 27 connected by a vertical web 26.

An oil inlet pipe 28 leads from the deepest part of the tank adjacent the end wall 3 to the pumping unit 19. A pipe 29 leads from the cylinder 21 in front of the piston 22 to the pumping unit 19 and also through a branch 30 to the upper cut-off valve 31 having an open outlet 32 to the tank.

The longitudinally disposed cylinder 33 is fixedly mounted within the tank below the reciprocating bed 10, the piston 34 having its rod 35 attached to an arm 36 projecting downwardly from the other end of the fin which depends from the bed 10.

The pumping unit 20 is provided with an intake pipe 37. A pipe 38 leads from the cylinder 33 in front of the piston 34, which pipe has a branch 39 leading to the pumping unit 20 and also a branch 40 which leads to the lower cut-off valve 41, which valve has an outlet 42 open to the supply tank.

These cut-off valves 31 and 41 may be of any well known or approved construction and are alternately opened and closed to render the pumping units 19 and 20 alternately effective, by any well known or approved means which will not be specifically described herein as it forms no part of the present invention, said means being operated by the bed in its reciprocating movements.

Where the motive fluid is a lubricating oil it may be used to oil the grooves 13 and 14 of the tracks 15 and 16 as follows:

An oil supply fitting 43 is connected to the front end of the cylinder 33, said fitting having a branch pipe 44 leading to the bottom of the groove 13 and a branch pipe 45 leading to the

bottom of the groove 14. Thus, every time that the pumping unit 20 introduces the oil under pressure into the cylinder 33 to move the piston 34 and thereby the bed 10, oil under pressure will be forced to the grooves 13 and 14 in the tracks 15 and 16 in which the bed runners 11 and 12 slide.

A single electric motor 46 is located outside the motive fluid tank between the lower and upper bottoms 6 and 7, said motor having a driving connection with the pump units 19 and 20 through belt and pulley connections as follows:

A pulley 47 on the motor shaft drives a belt 48 which passes upwardly into the space between the outer and inner end walls 4 and 5 and around a pulley 49 fast on a short shank 50. This shaft 50 is provided with a pulley 52 which drives a belt 51 passing around a pulley 53 on the shaft 54 of the pump.

The means which I have shown for ensuring the even movement of the bed by steadying it and by preventing it from lifting from its bed support, is constructed, arranged and operated as follows:

Two longitudinally disposed rows of anti-friction rollers 55 are located in position to bear upon the oppositely projecting bottom flanges 25 of the fin which depends from the bed 10. Each row of these anti-friction rollers is carried by a bar 56 free to travel longitudinally with the rollers as the bed is reciprocated. A vertically adjustable pressure bar 57 bears upon the tops of the said anti-friction rollers 55 and serves to hold them in contact with their bottom flange 25; the bolts 58 and 59 acting to secure the pressure bar in its adjusted position.

The feature of the immersing of the means for reciprocating the element in the liquid within the tank, shown and described but not claimed herein, forms the subject matter of my copending application filed June 21, 1932, its Serial No. being 618,479, of which this is a division.

It is evident that various changes may be resorted to in the construction, form and arrangement of the several parts without departing from the spirit and scope of my invention, and hence I do not wish to be limited to the particular embodiment herein shown and described, but

What I claim is:

1. In a machine of the character described, tracks, a bed reciprocating thereon, a fin depending from the bed between the tracks, said fin having opposite laterally projecting flanges, freely reciprocating bars, rows of anti-friction rollers carried thereby and bearing on the tops of said flanges upon opposite sides of the said depending fin, and pressure bars carried by said tracks in position to bear upon said rows of rollers.

2. In a machine of the character described, tracks, a bed reciprocating thereon, a fin depending from the bed between the tracks, said fin having opposite laterally projecting flanges, freely reciprocating bars, rows of anti-friction rollers carried thereby and bearing on the tops of said flanges upon opposite sides of the said depending fin, pressure bars carried by said tracks in position to bear upon said rows of rollers, said pressure bars being vertically adjustable, and means for securing the pressure bars in their adjusted positions.

CALVERT B. COTTRELL, 3D.