May 31, 1932. F. T. SHEEDY ET AL 1,860,693

LITHOGRAPHIC TRANSFER PRESS

Filed Aug. 26, 1930 2 Sheets-Sheet 1

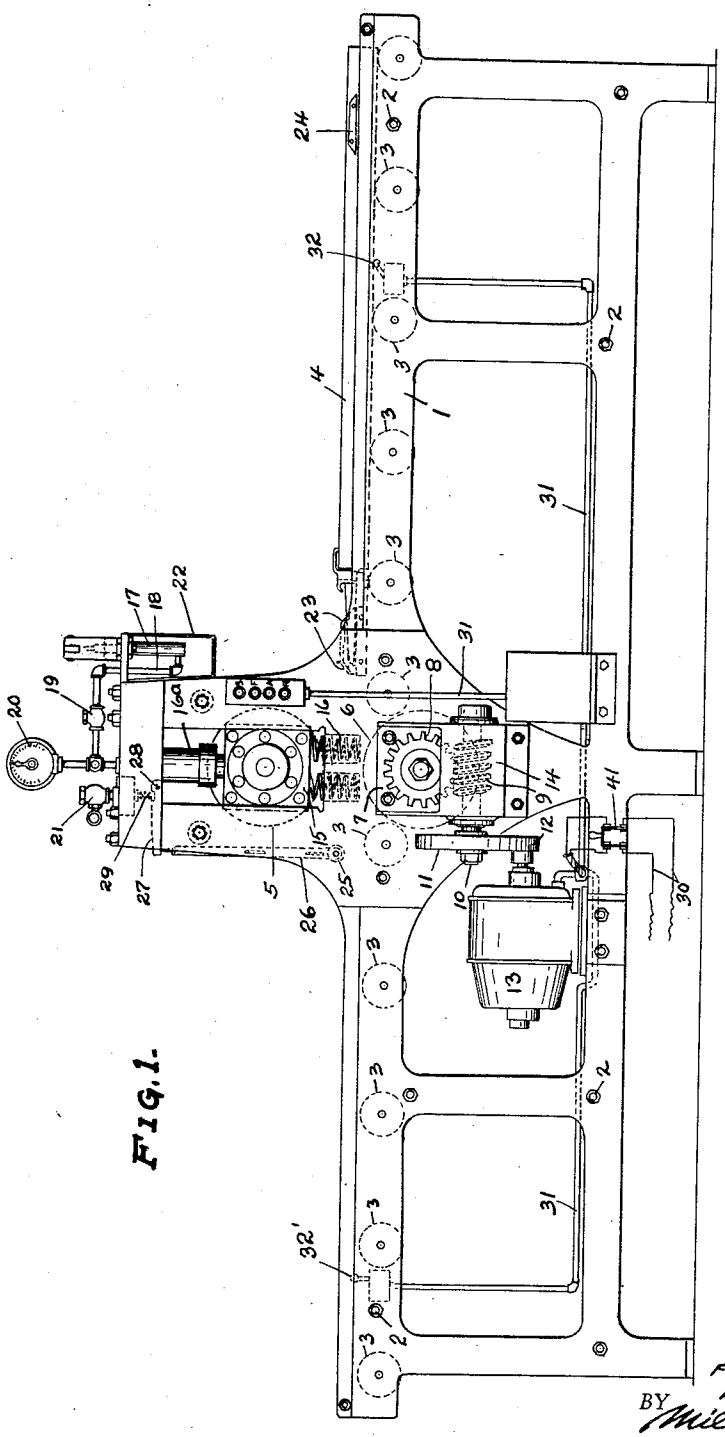


FIG. 1.

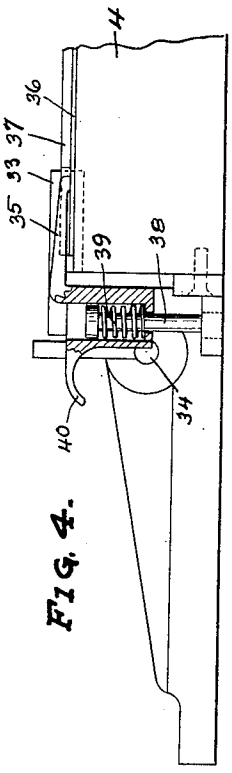


FIG. 4.

INVENTORS
FRANK T. SHEEDY
LOUIS TRAUNG
BY Miller Boyken & Brieal.
ATTORNEYS.

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Fig. 3.

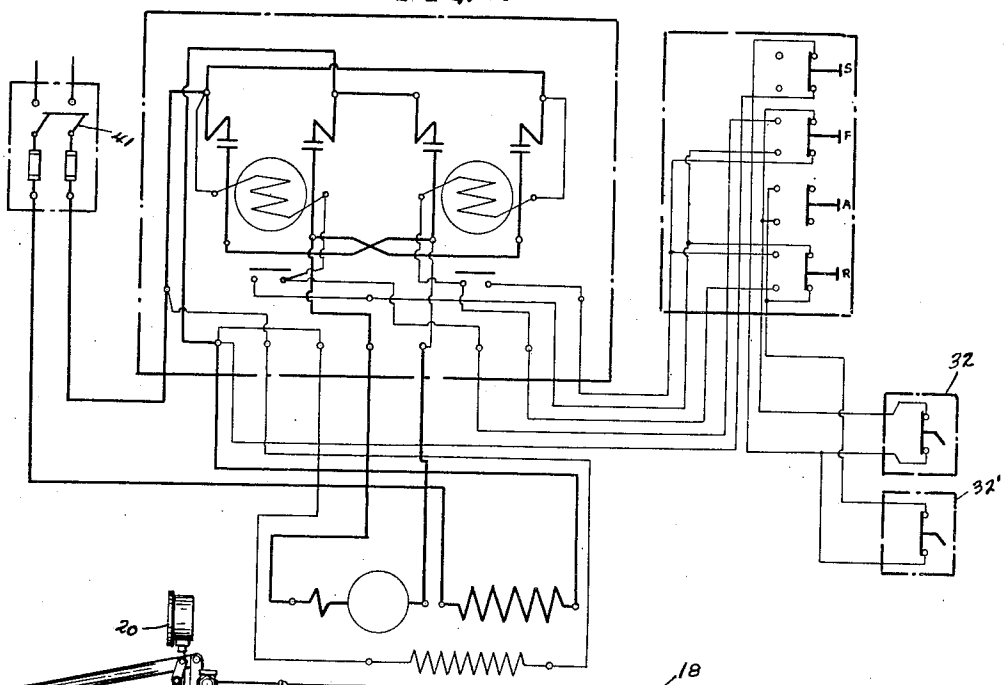
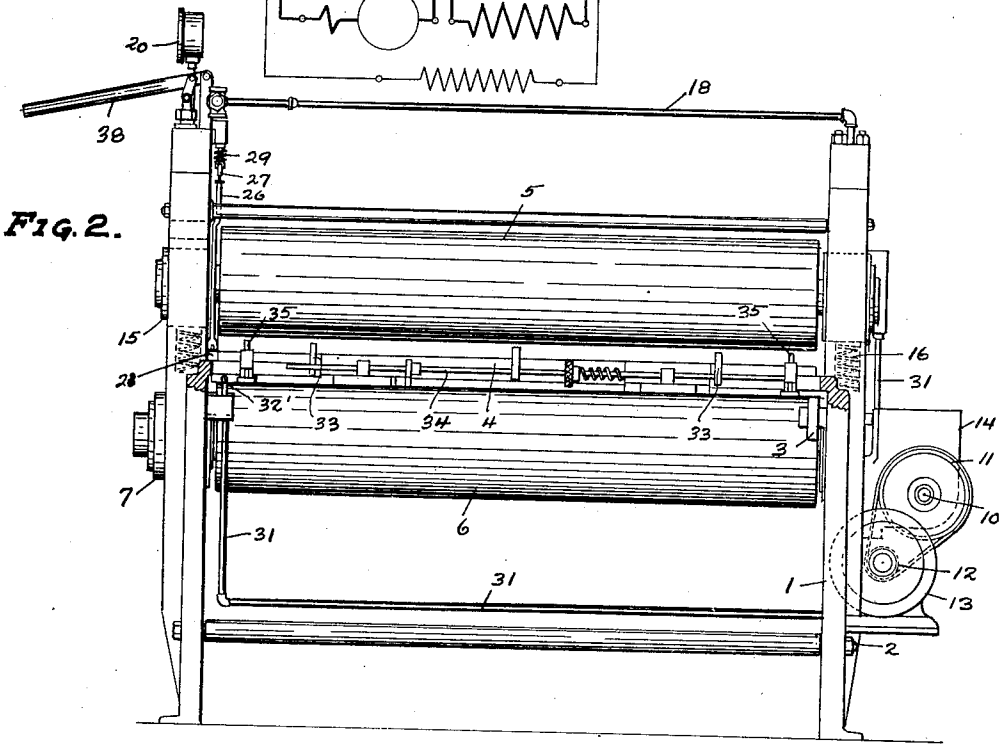


Fig. 2.



INVENTORS
FRANK T. SHEEDY
LOUIS TRAUNG
BY Miller Boykin & Brick.
ATTORNEYS.

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Patented May 31, 1932 1,860,693

UNITED STATES PATENT OFFICE

FRANK T. SHEEDY AND LOUIS TRAUNG, OF SAN FRANCISCO, CALIFORNIA, ASSIGNORS, BY DIRECT AND MESNE ASSIGNMENTS, TO THE TRAUNG COMPANY, OF SAN FRANCISCO, CALIFORNIA, A COPARTNERSHIP CONSISTING OF LOUIS TRAUNG, CHARLES F. TRAUNG, L. H. JACKSON, H. W. JOHNSTON, FRANK T. SHEEDY, AND H. T. GARDNER

LITHOGRAPHIC TRANSFER PRESS

Application filed August 26, 1930. Serial No. 477,860.

This invention relates to lithographic transfer presses of the hydraulic roller type disclosed in our joint U. S. Patent No. 1,783,888 of December 2, 1930, and the objects of the invention are to effect certain improvements in such presses whereby a better impression can be secured with less pressure, also whereby a better control of the bed movements is obtained, the drive is simplified, and other features contributing to positioning of the work on the bed of the press are provided.

In the drawings accompanying this application Fig. 1 is a side elevation of our improved hydraulic roller transfer press.

Fig. 2 is an end view of the press.

Fig. 3 is an electrical wiring diagram showing the motor and switch circuits for controlling the press.

Fig. 4 is an enlarged elevation of a corner of the bed showing one of the plate clamps.

In further detail the press comprises a horizontally disposed frame 1 formed of two side pieces suitably secured together in spaced relation as by stay bolts 2. Idler rollers 3 revolvably carried along the inner side of both frame members support a rolling flat bed 4 consisting of a thick metal slab, and which bed is adapted to roll between two large preferably equal size steel rolls 5 and 6 mounted in the central portions of the frame respectively above and below the bed.

Lower roll 6 is preferably of solid steel turned perfectly true and mounted for rotation in a fixed position so as to bring its upper surface just above the plane of the upper surface of idlers 3 so that when the bed 4 rolls over it the weight of the bed will be carried on the roll and relieved from the idlers. The ends of the roll are turned down to form axles which are preferably supported in roller bearing blocks indicated at 7 and one end is fitted with a worm gear 8 meshing with a worm 9 on a countershaft 10 in turn carrying a wheel 11 connected by a belt or chain with a wheel 12 on the shaft of an electric motor of the reversing type 13 mounted on the frame.

Worm gearing 8 and 9 operate in an oil housing 14, the upper portion of which is shown open in Figs. 1 and 2.

The other roll 5, also of solid steel, is an adjustable pressure roll, revolvably mounted in roller bearing blocks 15, vertically slidable in ways in the frame sides and normally urged upward by heavy spiral springs 16 positioned under the bearing blocks in suitable pockets formed in the frame, and forced downward by hydraulic cylinders 16*a* at each end of the roll operated by a small hand pump 17 carried on the frame and connected to both pressure cylinders by piping indicated at 18. The piping is fitted with a check valve 19, pressure gage 20 and relief valve 21 for breaking the pressure of the line and running the pressure liquid (oil) back into the pump sump 22.

Relief valve 21 is automatically operated by the rolling bed 4 at different points of its travel by means of cam plates or tripping wedges 23, 24 carried by and at one side of the bed and which contact a roller 25 on the lower end of a vertically slidable rod 26 which in turn lifts the end of a lever 27 pivoted at 28 to the frame and thereby opens the relief valve 21, the spring-actuated stem 29 of the valve automatically closing the valve and pushing lever 27 down as soon as either of the cams 23, 24 are withdrawn from under roller 25.

The particular setting of this relief trip in relation to the bed travel taken with the electric stops, reverses and advances to be presently described, constitute one of the most important features of the present improvement.

As stated, the electric motor 13 is of the reversing type. It is supplied with current from an outside source through wires 30 which are split into several circuits as shown in the wiring diagram Fig. 3, the wires being enclosed in conduits as at 31, and cut-off switches 32, 32′ for the motor are arranged at opposite ends of the frame to be tripped by contact with opposite ends of the traveling bed 4. These cut-off switches are reached and tripped at a point of the bed travel while roller 5 is still hard against the bed or work and before roller 25 is reached

to relieve the hydraulic pressure. The switches normally stand upright as the left-hand one designated 32′ but when either one is pressed over by the bed rolling over it, as shown by the right-hand switch 32, the motor will be stopped, and as soon as the bed rolls off of the switch it will spring back to vertical position.

Also controlling the motor are four switch buttons marked R, A, F, S, meaning reverse, advance, forward, and stop, respectively. These buttons are depressed by the operative to control the motor and spring out when released. The operation of these controls will be described later.

Since the press is for transferring prints made on transfer paper to a sheet of aluminum or zinc, the metal sheet is laid down face up on the bed of the press and registered by fitting its notches into spring-actuated gages 33 which normally lie in shallow recesses in the surface of the bed and are mounted on a shaft 34 for automatically tripping out of the way of the upper roll when the bed passes between the rolls by mechanism similar in all respects to that described in our patent mentioned. However, an additional feature not shown in the prior structure consists of a pair of corner clamps 35 which are arranged to clamp against the surface of the metal sheet adjacent the corners thereof and hold it firmly against the bed until the operative is ready to advance the bed through the rolls.

The construction of these clamps is best shown in Fig. 4, an enlarged side elevation of a corner of the bed, showing a clamp bearing down upon the metal sheet 36 near the corner, and with the corner of the cardboard or "key board" 37 cut away to clear. The clamp is mounted on a bolt 38 on which it may move vertically as well as rotate, but is normally urged downward by spring 39. A hooked handle 40 serves for lifting the clamp 35 from the corner of the plate, turning it around, and then lowering it so that it will drop below the bed and thus be out of the way of the rolls.

In operation of the press a sheet of prepared aluminum or zinc is placed on the bed 4 face up and aligned with its notches against the gages 33. The cardboard key board 37 with the two leading corners removed and bearing the transfer prints is laid face down on the plate after duly aligning its notches against the gages, but preferably after dropping the clamps upon the leading corners of the metal sheet so as to hold it firmly in position against the gages.

As soon as the clamps are released the bed is rolled between the large rollers by a shove of the hand and stopped at a point so that roll 5 will descend upon the work.

Pressure is next applied by operating the pump handle 38 until the desired pressure registers on the pressure gage 20, after which the pump is stopped and button F is pressed to start the motor and run the bed 4 in a forward direction (to the left in Fig. 1).

The bed will continue to travel until forward limit switch 32′ is tripped and it will then stop with the pressure roll still on the work. Reverse button R is then pressed and the motor will reverse and carry the bed back to trip reverse limit switch 32 and again stop the motor with the pressure roll still on the work. This back and forth movement of the bed is usually repeated about twice on a lithographic transfer, and after which the bed is moved back or out from under the pressure roll and the key board 37 lifted from the plate leaving the transfers all stuck to the plate. The backs of the transfers are then dampened slightly, a sheet of hard fiber board laid over the plate and the bed again rolled back and forth between the rolls. This dampening is repeated once more as explained and after which the metal plate is removed from the press for further treatment with water to release the transfer paper from the images on the sheet in the well-understood manner.

In order to move the bed out from under the pressure roll after the motor has been stopped by tripping of switch 32 button A (advance) is pressed and held down while button R (reverse) is pressed to thus re-establish the reversing circuit and again start the motor. The motor will run as long as the A button is held depressed, but of course as soon as the bed is out from between the rolls the running of the motor is without effect.

It is important however that the pressure roll be lifted or the hydraulic pressure broken before the bed is withdrawn, and this is accomplished by cam 23 engaging roller 25 while the roll 5 is still upon the work.

If it should be desired to move the bed in a forward direction (to the left in Fig. 1) beyond the rolls, cam 24 will lift roller 25 and break the hydraulic pressure before pressure roll 5 is off of the work. The additional advance movement of the bed is secured after tripping the forward limit switch 32′ by pressing button F (forward) and also pressing and holding down button A until the bed has passed out of the rolls.

If during either direction of travel of the bed it is desired to stop the press, this can be done by pressing button S (stop) instead of reaching for the main line switch 41.

A reference to the wiring diagram in Fig. 3 will make the operation of the electric control elements clear.

In the press of our joint patent a rubber covered pressure roll was used and it passed entirely over the bed at each reciprocation thereof in making lithographic transfers, whereas with the present press the rolls are plain, and the bed moves forward and backward without getting from under the pres-

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sure roll and this has been found to give a sharper transfer with less pressure as the aluminum or other sheet is subject to pressure at both movements of travel of the bed instead of by pressure at one way of travel only.

In considering the above it might be called to attention that our improved lithographic transfer press above described has already been placed in many of the largest lithographic concerns to entirely supplant the old scraper type of transfer presses heretofore in universal use.

We claim:

1. A transfer press including a pair of side frames with a flat bed reciprocably mounted thereon, a pressure roll extending across the press above the bed, means for adjusting the pressure of said roll against work on the bed, means for reciprocating the bed under the pressure roll while maintaining the pressure of the roll in contact with the work.

2. A transfer press including a pair of side frames with a flat bed reciprocably mounted thereon, a pressure roll extending across the press above the bed, means for adjusting the pressure of said roll against work on the bed, means for reciprocating the bed under the pressure roll while maintaining the pressure of the roll in contact with the work, and means for automatically stopping the motion of the bed with said roll under pressure against the work.

3. A transfer press including a pair of side frames with a flat bed reciprocably mounted thereon, a pressure roll extending across the press above the bed, means for adjusting the pressure of said roll against work on the bed, means for reciprocating the bed under the pressure roll while maintaining the pressure of the roll in contact with the work, and means for automatically stopping the motion of the bed with said roll under pressure against the work near one end of the bed.

4. A transfer press including a pair of side frames with a flat bed reciprocably mounted thereon, a pressure roll extending across the press above the bed, means for adjusting the pressure of said roll against work on the bed, means for reciprocating the bed under the pressure roll while maintaining the pressure of the roll in contact with the work and means for automatically stopping the motion of the bed with said roll under pressure against the work near both ends of the bed.

5. A transfer press including a pair of side frames with a flat bed reciprocably mounted thereon, a pressure roll extending across the press above the bed, means for adjusting the pressure of said roll against work on the bed, means for reciprocating the bed under the pressure roll while maintaining the pressure of the roll in contact with the work, means for automatically stopping the motion of the bed with said roll under pressure against the work, and means for advancing the bed beyond the automatic stopping point.

6. A transfer press including a pair of side frames with a flat bed reciprocably mounted thereon, a pressure roll extending across the press above the bed, means for adjusting the pressure of said roll against work on the bed, means for reciprocating the bed under the pressure roll while maintaining the pressure of the roll in contact with the work, means for automatically stopping the motion of the bed with said roll under pressure against the work, means for automatically relieving the pressure on said roll and means for advancing the bed beyond the automatic stopping point.

7. A transfer press including a pair of side frames with a flat bed reciprocably mounted thereon, a pressure roll extending across the press above the bed for rolling against work on the bed when same is reciprocated, reversible electric driving means arranged for reciprocating said bed, and an electric trip operated by the bed for stopping said driving means at a point of travel of the bed with said roll in contact with the work.

8. A transfer press including a pair of side frames with a flat bed reciprocably mounted thereon, a pressure roll extending across the press above the bed for rolling against work on the bed when same is reciprocated, reversible electric driving means arranged for reciprocating said bed, and electric trips operated by the bed for stopping said driving means at points of travel near opposite ends of the bed with said roll in contact with the work.

9. In a structure as specified in claim 7, means for again starting said electric driving means to move the bed beyond the automatic stopping point of the bed.

10. In a structure as specified in claim 8, means for again starting said electric driving means to move the bed beyond the automatic stopping points of the bed.

11. In a structure as specified in claim 7, means for again starting said electric driving means to move the bed beyond the automatic stopping point of the bed, and means for automatically releasing any pressure on said pressure roll before the bed passes from under the same.

12. In a structure as specified in claim 8, means for again starting said electric driving means to move the bed beyond the automatic stopping points of the bed, and means for automatically releasing any pressure on said pressure roll before the bed passes from under the same.

13. A transfer press comprising a frame of two spaced sides, a flat bed reciprocable on said frame, a pair of rolls between which said bed passes, hydrostatic pressure means operative against one roll for forcing it toward the other, a worm wheel on one end of

said other roll, a worm meshing with said worm wheel, and an electric motor driving said worm.

14. A transfer press comprising a frame of two spaced sides, a flat bed reciprocable on said frame, a pair of rolls between which said bed passes, hydrostatic pressure means operative against one roll for forcing it toward the other, a worm wheel on one end of said other roll, a worm meshing with said worm wheel, an electric motor driving said worm, and means for automatically stopping said motor by the travel of said bed.

FRANK T. SHEEDY.
LOUIS TRAUNG.