

June 9, 1931.

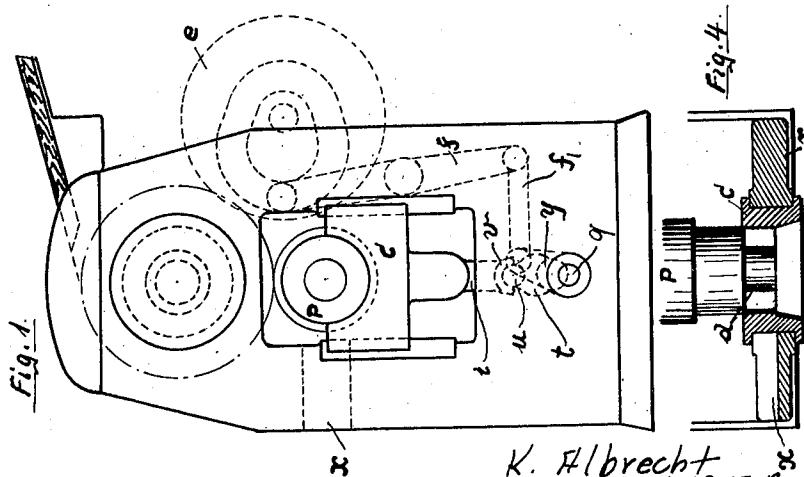
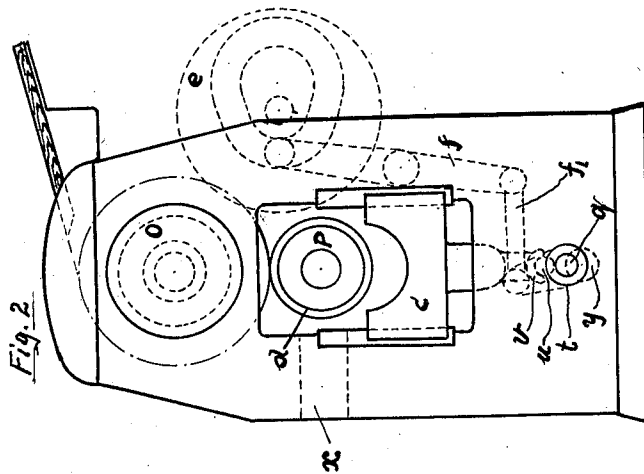
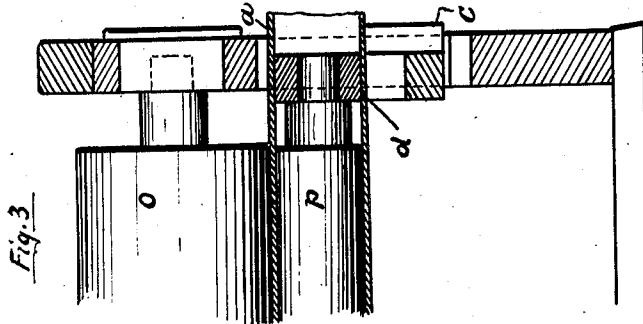
K. ALBRECHT

1,809,466

INTAGLIO PRINTING MACHINE

Filed Dec. 3, 1928

3 Sheets-Sheet 1



K. Albrecht
INVENTOR
By: Mavis H. Blair
ATTY.

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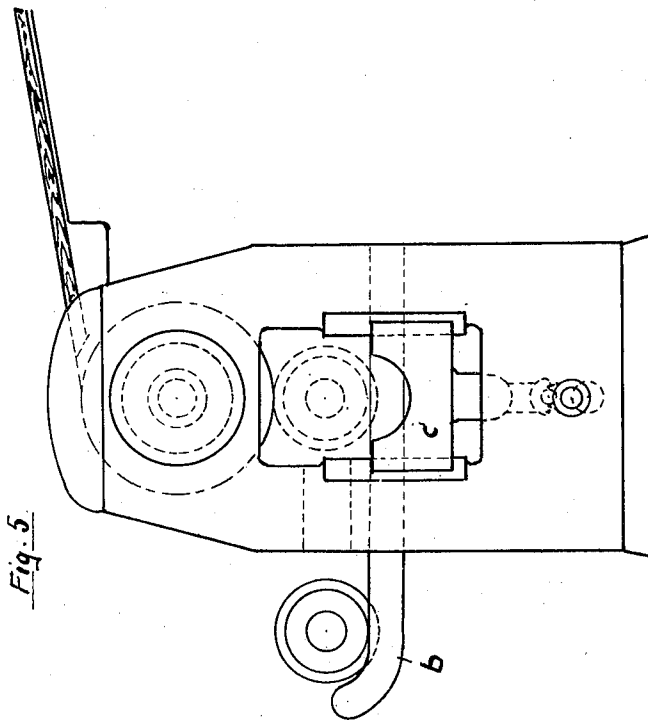
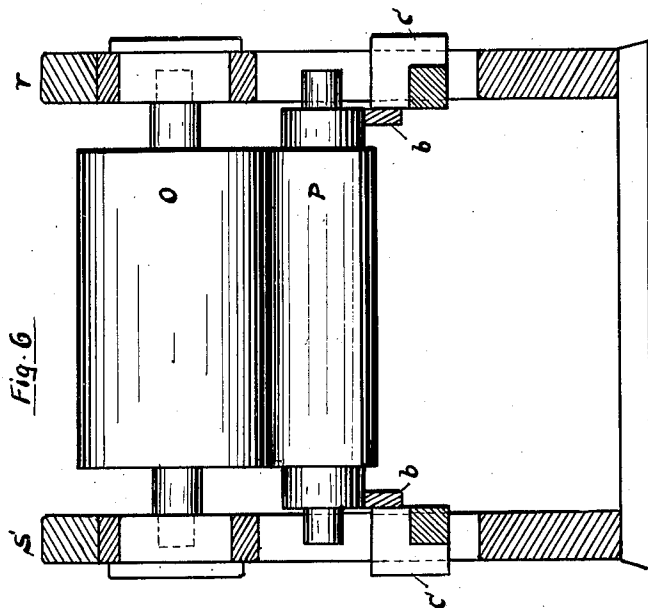
K. ALBRECHT

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INTAGLIO PRINTING MACHINE

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3 Sheets-Sheet 2



K. Albrecht
INVENTOR
By: Mado & Co.
ATTYS.

June 9, 1931.

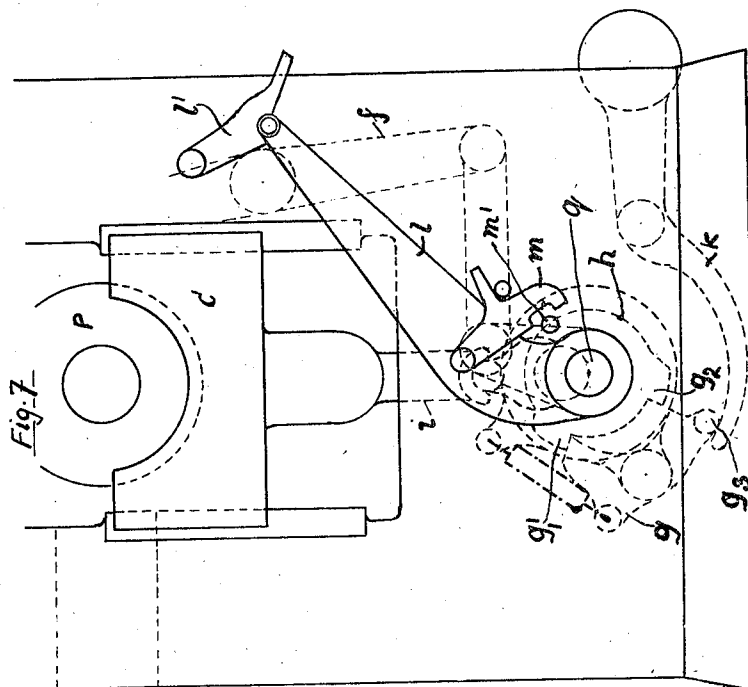
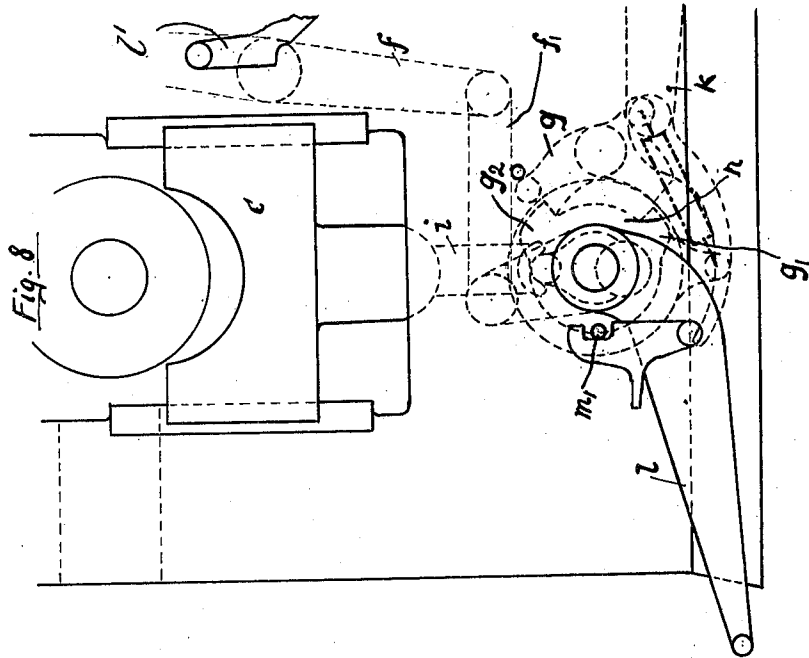
K. ALBRECHT

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INTAGLIO PRINTING MACHINE

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3 Sheets-Sheet 3



K. Albrecht
INVENTOR

By: *Marlo H. Allen*
ATTY.

UNITED STATES PATENT OFFICE

KARL ALBRECHT, OF GEISENHEIM-ON-THE-RHINE, GERMANY, ASSIGNOR TO MASCHINENFABRIK JOHANNISBERG, G. M. B. H., OF GEISENHEIM-ON-THE-RHINE, GERMANY

INTAGLIO PRINTING MACHINE

Application filed December 3, 1928, Serial No. 323,430, and in Germany December 8, 1927.

In intaglio printing machines the shape of the frame ends is determined by the requirement that the etched printing cylinders having the etched surface shall be capable of being easily and conveniently removed. The cylinders are removed in various ways. When copper tubes are used, the iron core of the printing cylinder remains in the machine and the tube is pushed in its axial direction through an opening in the frame end. This opening in the frame end is produced by removing one of the bearings in which the printing cylinder runs. For retouching and altering the etched surface, it is, however, desirable to be able to roll the printing cylinder out of the machine, that is to move it out of the machine at right angles to its axis.

When solid iron cores covered with an electrically deposited copper layer are used as printing cylinders, the whole printing cylinder has to be removed from the machine. The movement of the printing cylinder is in this case also at right angles to its axis. In order to enable this to be effected, the frame end has been made open at one side, that is has a gap in it, so that it has the form of an open bracket. When heavy pressures occur between the printing cylinder and the impression cylinder, more particularly at the beginning and end of the printing operation, the frame tends to bend apart or even to break, so that it is necessary to make the frame extremely strong, which is however not always possible for constructional reasons and for the rest considerably increases the cost and the weight of the machine.

The present invention overcomes these disadvantages and makes it possible both to remove the printing cylinder from the machine at right angles to its axis and the copper tube supported by it parallel to its axis. This is effected by both bearing housings for the printing cylinder being made capable of being lowered, one of them being provided in a known manner with an opening for the passage of the copper tube, the machine frame being constructed as a closed frame having the wall recessed back at one place, such that the printing cylinder can be moved as a whole

out of the machine also at right angles to its axis. Separate guiding rails capable of being inserted are preferably provided, on which for effecting this motion the printing cylinder can be rolled with its journals.

In the accompanying drawings a constructional example of the invention is shown,

Fig. 1 being a side elevation of the machine frame of an intaglio printing machine with the printing cylinder in the printing position,

Fig. 2 a similar side elevation to Fig. 1, showing the bearing housings of the printing cylinder in the lowered position,

Fig. 3 a part longitudinal section through the machine frame and the bearing, showing the printing cylinder being withdrawn in the direction of its axis and

Fig. 4 a section on line 4—4 of Fig. 1.

Figure 5 is a side elevation similar to Figures 1 and 2 showing the printing cylinder being withdrawn on rails in the direction at right angles to its axis.

Figure 6 a cross-section through the frame showing the printing cylinder being withdrawn on rails in the direction at right angles to its axis.

Figures 7 and 8 are fragmental views corresponding to Figures 1 and 2 but drawn to a larger scale and showing the mechanism for lowering the bearing housings *c*.

The two bearing housings *c* are adapted to be lowered simultaneously in order to enable the printing cylinder *p* to be withdrawn in the direction at right angles to its axis and the bearing housing of the side where the machine is attended to is adapted to be lowered separately when the copper tube *a* is to be drawn out in the direction of its axis. The lowering of the bearing housings *c* is effected in two stages, the printing cylinder being first of all lowered a little automatically in order to relieve it of the pressure of the impression cylinder *o*, further lowering of the bearing housings being effected by hand, to the position enabling the printing cylinder *p* or the copper tube *a* to be withdrawn.

The disc cam *e* rotates continuously and, through the intermediary of a roller lever *f* and a connecting rod *f*¹ connected to a crank

arm n on a rockshaft q , oscillates the latter, together with a crank pin y mounted on the shaft q . The crank pin y is connected by a link t to a stem i of the bearing housing c , said stem having a bearing surface v which rests on a journal u of the link t . Thus, when the shaft f^1 is rocked, the bearing housing c is raised and lowered slightly. The movement thus effected is very small.

10 In order to enable the bearing c to be lowered into the position shown in Figure 2, the crank pin y is mounted on a member which is rotatable on the shaft q and is latchable thereto by means of a pawl g which is pivoted on the member and engages a tooth g^1 on a disc h fixed to the shaft q . If the copper tube a is to be taken off, the bearing housing is lowered from the position shown in Figure 1 to that shown in Figure 2 by turning the hand lever l , which is rotatable on the shaft q , from the position shown in Figure 7 to that shown in Figure 8. This hand lever l has pivoted on it a catch m which, in the inoperative position of the lever, is out of engagement with a pin m^1 on the disc h but engages said pin on the lever l being turned anticlockwise and turns the disc h round with it, the tooth g^1 engaging the pawl g and turning the member on which the latter is mounted, thereby moving the crank pin y into the position shown in Figures 2 and 8. By this means the bearing housing c is lowered to such an extent that the copper tube a may be removed axially from the printing cylinder p .

35 In order to remove the printing cylinder p with or without the copper tube a in a direction at right angles to its axis, or to enable the printing cylinder as a whole to be rolled into a position in front of the machine for retouching purposes, two rails b are attached to the side walls r and s (Figures 5 and 6). Both the bearing casings c of the printing cylinder are then lowered in the manner above described. For this purpose each bearing casing is provided with hand-operated lowering gear, comprising a lever l , catch m , disc h and pawl g . During the lowering of the bearing casings c the printing cylinder p comes to rest on the rails b , in which position the bearings of the printing cylinder are clear of the bearing housings c . The printing cylinder can now be rolled on these rails to the front of the machine and, if required, removed therefrom. The side walls r and s have recesses x having a depth such that the distance between the bottoms of these recesses will be greater than the length of the printing cylinder p and its journals and being of sufficient width to allow the bearings to pass through them. By this means the cylinder p is free to roll along the rails as shown in Figures 5 and 6. Thus, notwithstanding that the frames are completely closed, it is possible to remove the printing cylinder p from the machine quite readily when required. In

order to enable the bearing casing c to be raised again from the position shown in Figure 8 to that shown in Figure 7, means are provided for withdrawing the pawl g out of engagement with the tooth g^1 and moving its tail end (which is also constructed as a pawl) into engagement with a second tooth g^2 on the disc h . The pawl g is normally urged into engagement with the tooth g^1 by means of a spring, but during the lowering of the bearing casings c a roller g^3 on the tail of the pawl g rides on a cam lever k which rocks the pawl g and moves its tail end into engagement with the tooth g^2 (see Fig. 8). Thus on the lever l being turned clockwise from the position shown in Figure 8, the tooth g^2 will engage the tail of the pawl g and will take the member on which the crank pin y is secured round with it and in doing so will raise the bearing housings c . In the inoperative position of the lever l a catch l^1 pivoted in the frame n engages the lever and locks it in position, the catch m being held out of engagement with the pin m^1 and at the same time supporting the lever l as shown in Figure 7.

What I claim is:

1. An intaglio printing machine comprising in combination an impression cylinder, a printing cylinder positioned below the impression cylinder and capable of coacting therewith, bearings for the said cylinders, frame ends for supporting the said bearings and having no free openings therein extending to the sides thereof, means for lowering the printing cylinder bearings in the said frame ends, each frame end having an internal recess extending from the printing cylinder bearing to the side of the frame end, the machine being adapted to receive means insertable therein for supporting the printing cylinder on the bearings thereof being lowered and guiding the cylinder through the said recesses at right angles to its axis out of the machine, as and for the purposes set forth.

2. An intaglio printing machine comprising in combination an impression cylinder, a printing cylinder positioned below the impression cylinder and capable of coacting therewith, bearings for the said cylinders, frame ends for supporting the said bearings and having no free openings therein extending to the side thereof, means for lowering the printing cylinder bearings in the said frame ends, an internal recess in each frame end extending from the printing cylinder bearing to the side of the frame the machine being adapted to receive rails capable of being inserted in the machine and of acting as runways for rolling the printing cylinder out of the machine through the said recesses at right angles to its axis, as and for the purpose set forth.

In testimony whereof I have signed my name to this specification.

KARL ALBRECHT.