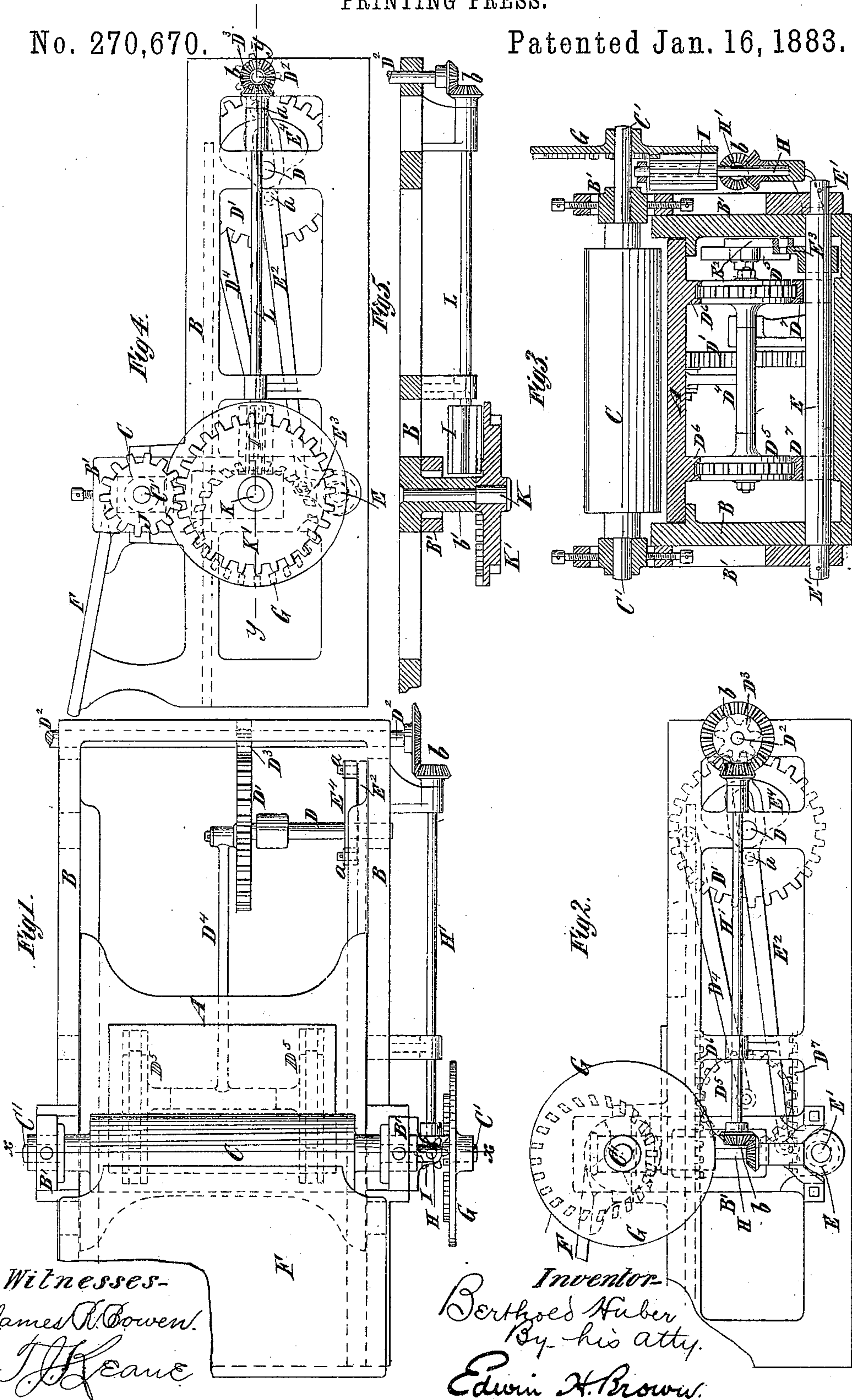


(No Model.)

B. HUBER.  
PRINTING PRESS.

No. 270,670.

Patented Jan. 16, 1883.





# UNITED STATES PATENT OFFICE.

BERTHOLD HUBER, OF TAUNTON, MASSACHUSETTS.

## PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 270,670, dated January 16, 1883.

Application filed April 3, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, BERTHOLD HUBER, of Taunton, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Printing-Presses, of which the following is a specification.

My invention is applicable to printing-presses in which the cylinder makes either one revolution or two or more revolutions to each complete stroke of the bed, and in which a crank is employed to reciprocate the bed. In such presses the cylinder is supported in bearings which are adjustable vertically to compensate for wear and for different thicknesses of the form, all of which adjustments are very slight, and where the cylinder makes two or more revolutions to each complete stroke of the bed it must have a rising and falling motion imparted to it to enable it to clear the form in the return movement of the bed.

The object of my invention is to enable the cylinder to be adjusted or moved vertically without interfering with the proper operation of the mechanism which rotates the cylinder.

To this end the invention consists essentially in a printing-press comprising a bed, a crank for reciprocating it, a cylinder, bearings for said cylinder, which provide for a vertical movement thereof, and mechanism for rotating the cylinder, comprising a cam-shaped crown-wheel and an elongated spur-wheel engaging therewith, whereby the movements of the cylinder are made to conform to those of the bed, all being so combined and organized that provision is afforded for the movement of the cylinder toward and from the form by the teeth of one wheel moving relatively to those of another wheel.

The invention also consists in the combination, with the bed and cylinder of a printing-press, of a crank for reciprocating the bed, a cam-shaped crown-wheel upon the shaft of the cylinder, an upright shaft arranged below the cylinder-shaft, and an elongated spur-wheel upon said upright-shaft engaging with said crown-wheel, whereby provision is afforded for the movement of the cylinder toward and from the form by the movement of the teeth of the crown-wheel relatively to those of the spur-

wheel, and the movements of the cylinder are made to conform to those of the bed.

The invention also consists in the combination, with the above, of an arrangement of shafts and gearing, particularly hereinafter described and claimed, for connecting the said crank and upright shaft.

In the accompanying drawings, Figure 1 represents a plan of a printing-press which embodies my invention, and in which the cylinder makes two revolutions to each complete stroke of the bed. Fig. 2 represents a side elevation thereof. Fig. 3 represents a transverse section on the dotted line *xx*, Fig. 1. Fig. 4 represents a side view of a press of modified form, also embodying my invention; and Fig. 5 represents a horizontal section of one side portion thereof upon the dotted line *yy*, Fig. 4.

In the several figures only such parts are shown as are necessary to illustrate my invention, and similar letters of reference designate corresponding parts in all the figures.

Referring first to Figs. 1, 2, and 3, A designates the bed, which is adapted to be reciprocated in suitable slideways in the side frames, B, and C designates the cylinder, which is journaled in vertically-movable frames or housings B' on the outside of the side frames, B, and the bearings of which are adjustable vertically in said frames or housings by means of set-screws, as shown in Fig. 3, or in any other suitable manner, so as to provide for adjusting the cylinder toward and from the form to suit different thicknesses of form and to compensate for wear.

D designates a horizontal shaft carrying at its inner end a crank, D', which is formed by a spur-gear wheel; and D<sup>2</sup> designates a horizontal driving-shaft carrying a pinion, D<sup>3</sup>, which engages with and transmits motion to the crank D'. The crank D' operates a connecting-rod, D<sup>4</sup>, which has at its opposite end a short shaft carrying two spur-gear wheels, D<sup>5</sup>, as shown clearly in Fig. 3. The gear-wheels D<sup>5</sup> engage with and are moved bodily between racks D<sup>6</sup>, attached to the under side of the bed A, and opposite stationary racks D<sup>7</sup>, and their combined bodily and rotary movements trans-



mit to the bed a movement double the throw of the crank  $D'$ . In lieu of the crank working in a vertical plane, a crank working in a horizontal plane or any other suitable device may be used.

In order to enable the cylinder to clear the form during the return movement of the bed, it is necessary to raise the cylinder, and this rising and falling movement is imparted to the frames or housings  $B'$  by means of a rock-shaft,  $E$ , extending across the press, and having eccentric journals  $E'$ , which fit the frames or housings, as shown clearly in Fig. 3. The rock-shaft  $E$  is oscillated by means of a connecting-rod,  $E^2$ , which is attached to an arm,  $E^3$ , on said shaft, and which is reciprocated by a cam,  $E^4$ , on the shaft  $D$  engaging with rollers  $a$  on the rod.

$F$  designates the usual feed-board, arranged above the cylinder  $C$ . Upon the shaft  $C'$  of the cylinder  $C$  is fixed a cam-shaped crown-wheel,  $G$ , and extending downward from the cylinder-shaft is an upright shaft,  $H$ , which is driven from the driving-shaft  $D^2$  by means of a horizontal shaft,  $H'$ , and pairs of bevel-wheels  $b$ . Hence it will be seen that the upright shaft is connected with the crank  $D'$ .

Upon the upright shaft  $H$  is an elongated spur-wheel,  $I$ , which engages with and drives the wheel  $G$ , and by said wheels  $G$  and  $I$  the movements of the cylinder are made to conform to those of the bed during the time of printing, the cylinder making two revolutions at each complete stroke of the bed.

When the cylinder  $C$  is adjusted upward or downward or rises and falls the teeth of the wheel  $G$  move freely relatively to the teeth of the elongated spur-wheel  $I$  in the direction of the axis of the pinion, and such adjustment or movement of the cylinder does not therefore interfere with the proper operation of the driving mechanism.

Referring now to Figs. 4 and 5,  $B$  designates the side frame of the press; and  $C$  designates the cylinder, which is mounted in bearings adjustable in frames or housings  $B'$ , which are given a rising and falling motion by a rock-shaft,  $E$ , which carries an arm,  $E^3$ , and is oscillated through a connecting-rod,  $E^2$ , by a cam,  $E^4$ , on the crank-shaft  $D$ , as previously described.

$F$  designates the feed-board, arranged above the cylinder  $C$ .

Upon the cylinder-shaft  $C'$  is mounted a spur-wheel,  $J$ , and below, upon a shaft or journal,  $K$ , is a second spur-wheel,  $K'$ , engaging with the wheel  $J$ . The shaft or journal  $K$  has a fixed bearing in a hub or projection,  $b'$ , on the side frame,  $B$ , and the adjacent housing or frame  $B'$  is slotted to receive the hub or projection  $b'$  through it, as shown in Fig. 5.

On the same shaft or journal,  $K$ , with the spur-wheel  $K'$  is a cam-shaped crown-wheel,  $G$ , and, as here represented, both the wheels  $K'$  and  $G$  are formed integral, they being cast on opposite sides of a circular plate or flange.

$D^2$  designates the driving-shaft, which has upon it a pinion,  $D^3$ , engaging with the crank  $D'$  on the crank-shaft  $D$ , and the bed  $A$  is operated through the connecting-rod  $D^4$  and rolling gear-wheels engaging with stationary racks and racks on the bed, as previously described with reference to Figs. 1, 2, and 3.

$L$  designates a horizontal shaft driven from the driving-shaft  $D^2$  by miter-wheels  $b$ , and which is therefore connected with the crank for operating the bed.

Upon the shaft  $L$  is an elongated spur-wheel,  $I$ , which engages with and operates the crown-wheel  $G$ , and thereby the movements of the cylinder may be made to conform to those of the bed produced by a crank, the cylinder making two revolutions at each complete stroke of the bed.

In this example of my invention provision is afforded for the vertical adjustment and the rising and falling movement of the cylinder by the teeth of the wheel  $J$  moving relatively to the teeth of the wheel  $K'$ .

My invention may be embodied in printing-presses in which the cylinder makes only one revolution to one complete stroke of the bed, and in such presses the cylinder would have no rising and falling movement, but would be adjustable vertically only to compensate for wear and to allow for different thicknesses of form. In such case the teeth of one wheel, moving relatively to those of another wheel, as above described, would enable the vertical adjustment to be performed without at all interfering with the proper operation of the mechanism for operating the cylinder.

It is obvious that the shaft  $H'$  in Figs. 1, 2, and 3 or the shaft  $L$  in Figs. 4 and 5 might be operated directly from the shaft  $D$  instead of from the shaft  $D^2$ ; but in such case the bevel-wheels  $b$  for operating the shaft  $H'$  or  $L$  must be properly proportioned to give two revolutions of the cylinder to each complete stroke of the bed.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a printing-press, a bed, a crank for reciprocating it, a cylinder, bearings for said cylinder, which provide for a vertical movement thereof, and mechanism for operating the cylinder, comprising a cam-shaped crown-wheel and an elongated spur-wheel engaging therewith, whereby the movements of the cylinder are made to conform to those of the bed, all being so combined and organized that provision is afforded for the movement of the cylinder toward and from the form by the teeth of one wheel moving relatively to those of another, substantially as herein described.

2. The combination, with the bed and cylinder of a printing-press, of a crank for reciprocating the bed, a cam-shaped crown-wheel upon the shaft of the cylinder, an upright shaft below the cylinder-shaft, and an elongated spur-wheel upon said upright shaft engaging with said crown-wheel, whereby provision is

afforded for the movement of the cylinder toward and from the form by the movement of the teeth of the crown-wheel relatively to those of the spur-wheel, substantially as herein described.

3. The combination of the bed A, the cylinder C, the crank-shaft D, and crank D', the cam-shaped crown-wheel G upon the cylinder-shaft, the upright shaft H, and elongated

spur-wheel I, and the driving-shaft D<sup>2</sup>, pinion D<sup>3</sup>, shaft H', and bevel-wheels b, connecting said upright shaft with said crank, substantially as described.

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Witnesses:

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