(No Model.)

B. HUBER.

PRINTING MACHINE.

No. 301,817. Patented July 8, 1884.

Fig. 3.

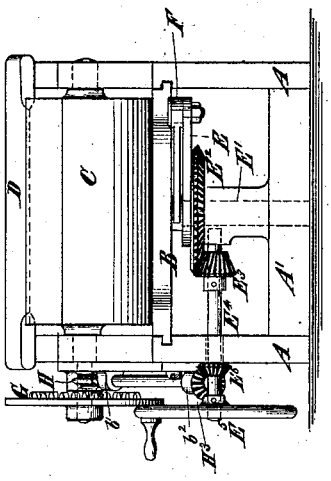


Fig. 5.

Fig. 4.

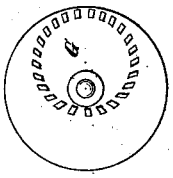


Fig. 6.

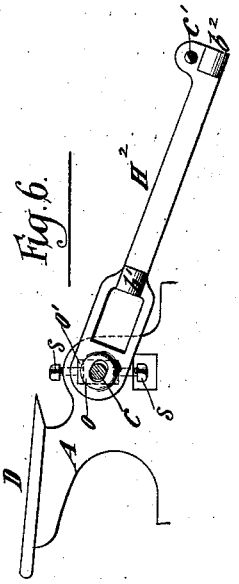


Fig. 2.

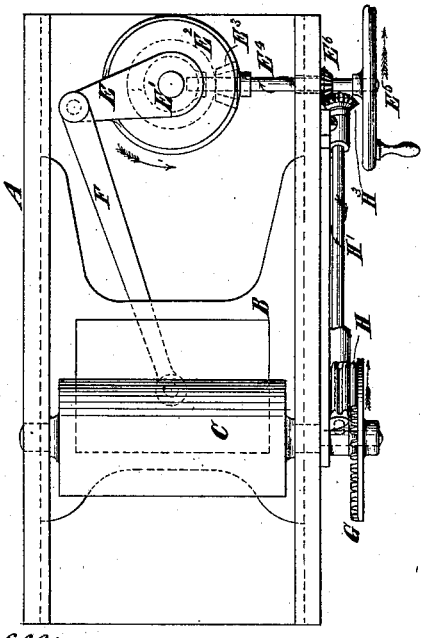
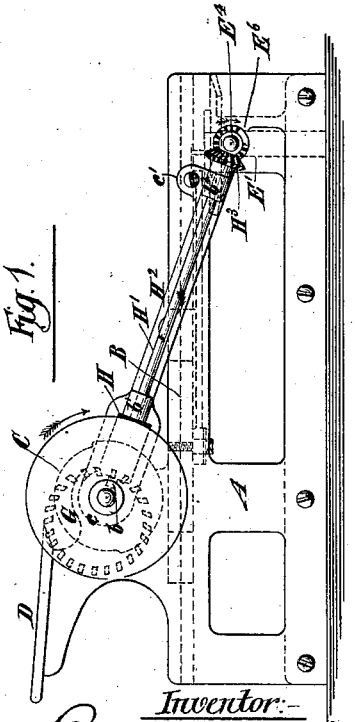


Fig. 1.



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UNITED STATES PATENT OFFICE.

BERTHOLD HUBER, OF TAUNTON, MASSACHUSETTS.

PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 301,817, dated July 8, 1884.

Application filed June 21, 1881. (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-Machines, of which the following is a specification.

My present improvements relate to those printing-presses which are known as "cylinder-presses," and wherein a bed carrying the form travels forward and backward and a cylinder travels in unison therewith during the time of printing.

The object of the improvements is to produce a simple and desirable mechanism for imparting motion to the bed, and for driving the cylinder in unison with the bed during printing, and with a gradually increasing and decreasing movement at the commencement and termination of its movement in each direction.

The improvement consists in the combination, with the cylinder and the shaft extending at right angles thereto, of adjustable bearings for said shaft that will permit it to accommodate itself to the vertical adjustment of the cylinder, as hereinafter particularly described.

In the accompanying drawings, Figure 1 is a side elevation of a printing-press embodying my improvements. Fig. 2 is a plan of the same. Fig. 3 is an end elevation thereof. Fig. 4 is a face view of a crown-wheel which is comprised in the press. Fig. 5 is an end view of a pinion with which the said crown-wheel engages; and Fig. 6 is a side view of certain parts of the press, hereinafter to be explained.

Similar letters of reference indicate corresponding parts in all the figures.

A A′ designate the frame of the press. It may be of any approved construction, and as here shown consists of two side pieces, A, and connecting-stretchers or cross-pieces A′.

B designates a bed for carrying the form. It is adapted to slide or reciprocate forward and backward in grooves or ways *a* in the side pieces, A, of the frame A A′.

C designates a cylinder adapted to travel in unison with the bed during the time when the printing is being performed.

D designates a feed-board, which may be of any desirable style.

E designates a crank operating in a horizontal plane, and serving to impart the desired motion to the bed. It is shown as affixed to the upper end of a vertically-arranged shaft, E′, provided with a bevel-wheel, E^2, with which engages a bevel-pinion, E^3, arranged on a shaft, E^4. This shaft E^4 constitutes the driving-shaft of the machine, and may have motion imparted to it by any suitable means. A wheel, E^5, provided with a hand-crank, is shown for this purpose. The crank E is directly connected by means of a rod, F, with the bed B, preferably on the under side and near the middle of its length, and imparts to the bed a movement equal in length to the throw of the crank. The crank, operating in a horizontal plane, does not tend to tilt or lift the bed, and imparts to it a slow motion at the ends of each stroke, so that it may be run with safety at a high speed. It will be observed that the crank during its push on the bed in propelling the bed in one direction tends to force the bed against one of the side pieces A and away from the other, and that during its pull on the bed, while propelling it in the reverse direction, it likewise tends to force or draw the bed against the same side frame and away from the other. This is advantageous, in that it aids in obviating inaccuracies in registering, which would result from lateral motions of the bed in different directions.

The cylinder C may be of any suitable construction. It may be supported in the usual way in vertically-adjustable journal-boxes.

G designates a crown gear-wheel fixedly mounted on one of the journals of the cylinder C. As here shown, its teeth project from the side which is toward the cylinder, and are arranged in a circle eccentric to the axis of the cylinder, but with their adjacent faces radiating from the axis of the cylinder. Its teeth may, however, be arranged in any other way, so as to attain the desired motion of the cylinder—as, for instance, in the form of a cam, if desirable. This crown-wheel is intended to insure the movement of the cylinder in unison with the bed during the printing, and a gradually decreasing and increasing speed of the cylinder at the termination and commencement of the movement of the cylinder in each direction. This crown-wheel engages with a pinion, H, which is of such length that all the

teeth of the crown-wheel may mesh with its teeth. The pinion H is arranged on a shaft, H′, supported in bearings *b b′ b²* in a frame, H^2. In order that this frame may accommodate itself to the vertical adjustment of the cylinder to which I have before alluded, I provide one end of the frame with a bearing, *c*, upon the journal of the cylinder upon which the crown-wheel G is mounted, and I provide the other end of said frame with a bearing, *c′*, which is hung on the adjacent side piece A of the frame A A′. Obviously the said frame H^2, the shaft H′, and pinion H may then rise and fall with the cylinder.

H^3 designates a bevel pinion or wheel arranged on the lower end of the shaft H′, and engaging with a bevel pinion or wheel, E^6, on the driving-shaft E^4, whereby motion is imparted to the shaft, and thence to the cylinder. When the frame H^2 is thus supported, the teeth, pinion, or wheel H^3 will move outward with relation to the teeth of the pinion or wheel E^6 when the cylinder rises. The vertical adjustment of the cylinder never amounts to more than a small fraction of an inch, and although there would be a very slight outward movement or canting of the wheel H^3 relatively to the wheel E^6, such movement is so slight in practice that its effect is not appreciable and not at all objectionable. This may be obviated by providing the frame H^2 with a bearing concentric with the driving-shaft E^4, in lieu of the bearing *c′*. Then to prevent any binding of the parts when the cylinder rises, the latter may be made to rise in arc-shaped slots concentric with the driving-shaft E^4. As here shown, however, the bearing *o* of the cylinder-journal is arranged in a slot or opening, *o′*, in the side piece, A, in which it may be adjusted up or down by means of set-screws *s*, as clearly shown in Fig. 6, which shows a side view of a portion of one of the side pieces, A, and the frame H^2, the gear-wheel G being omitted. The bearing *c* of the frame H^2 is slightly elongated, as clearly seen in Fig. 6, to allow of the vertical movement or adjustment of the cylinder.

The bed B and cylinder C are shown in Figs. 1 and 2 as at the middle of the movement which they have during the operation of printing, and the cylinder in the press shown is designed to make one revolution to produce one impression. It is obvious that the cylinder could be caused to make two or more revolutions by making the disk of the crown-wheel a spur-gear wheel, and using it as an intermediate device for transmitting motion to the cylinder. It will then rotate independently of the cylinder and have two or more times as many teeth as the gear-wheel carried by the cylinder with which it will engage. If it is desirable to impart to the bed a longer movement than could conveniently be imparted to it from a crank alone, the motion derived from the crank may be multiplied by any suitable mechanism—such, for instance, as gearing.

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

In a printing-press, the combination of an adjustable cylinder, a driving-shaft, and a shaft extending at right angles to the cylinder, serving to transmit motion thereto, and supported in adjustable bearings that will permit it to accommodate itself to the vertical adjustment of the cylinder, substantially as specified.

BERTHOLD HUBER.

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