3 Sheets--Sheet 1.

C. B. COTTRELL.

Printing-Press.

No. 167,227. Patented Aug. 31, 1875.

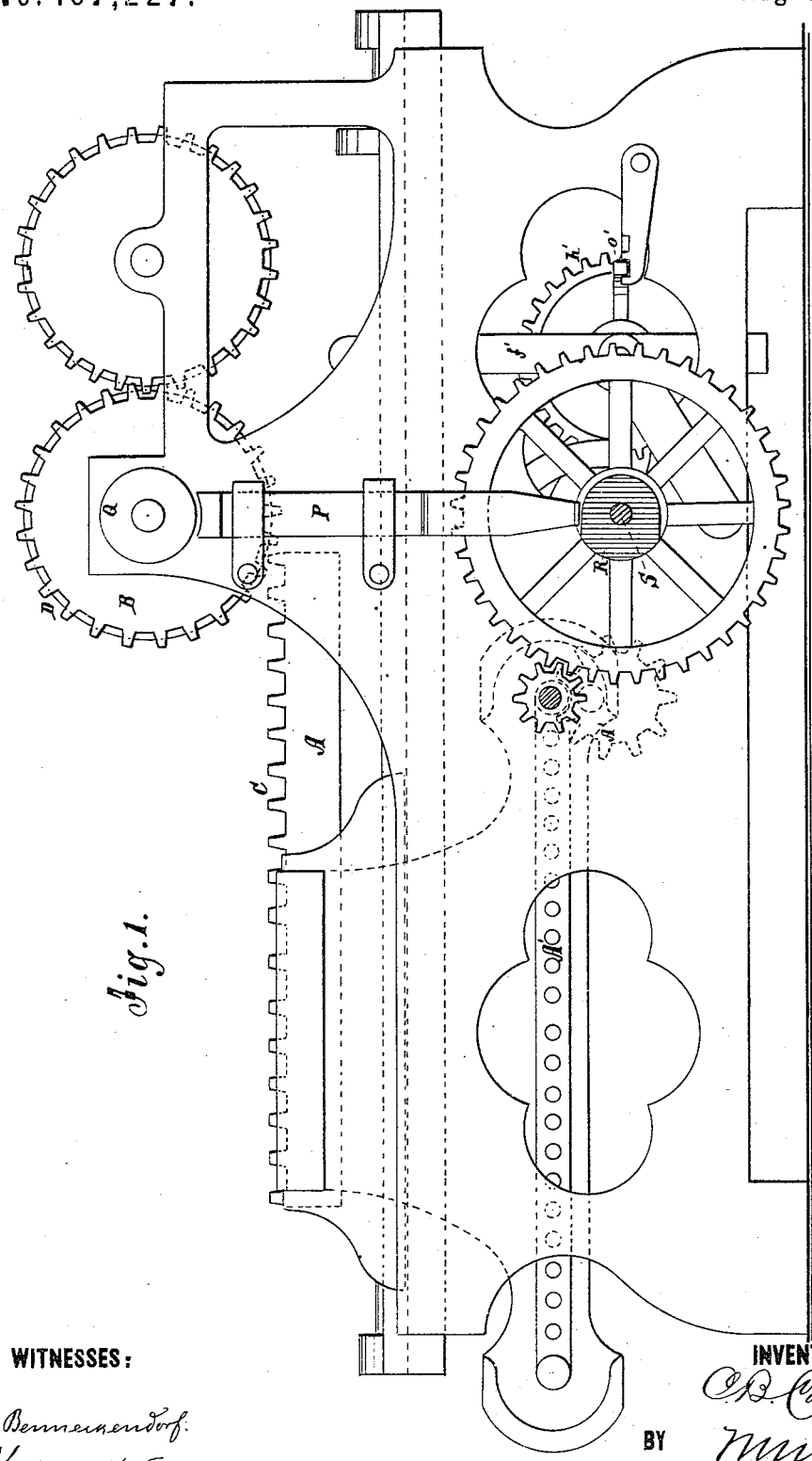

Fig. 1.

WITNESSES:

A Bennenendorf.
Sedgwick

INVENTOR:

C. B. Cottrell

BY Munn & Co

ATTORNEYS.

3 Sheets--Sheet 2.

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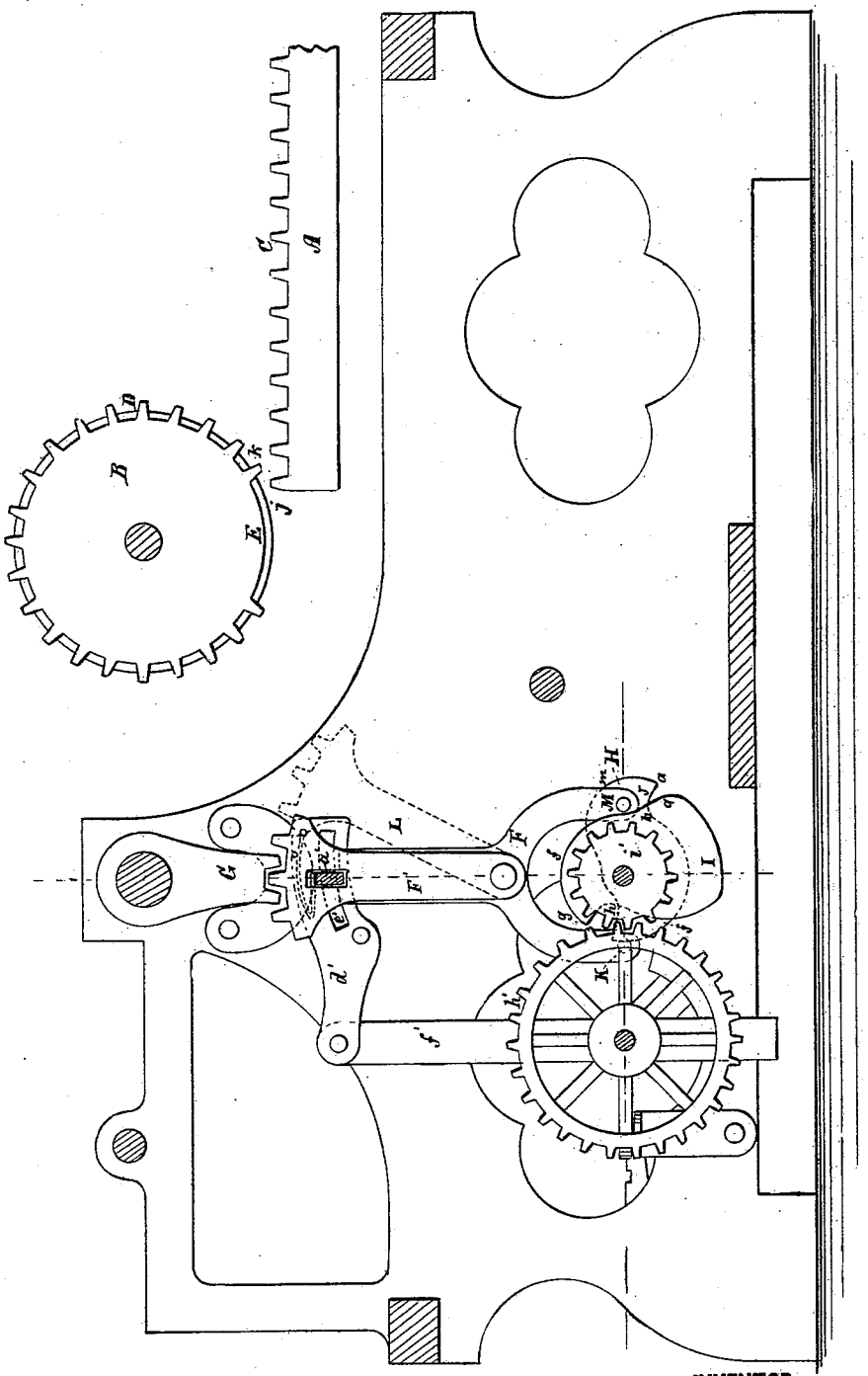

Fig. 2.

WITNESSES:

A Bennewendorf
C Sedgwick

INVENTOR:

C. B. Cottrell

BY

ATTORNEYS.

C. B. COTTRELL.
Printing-Press.

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Fig. 4.

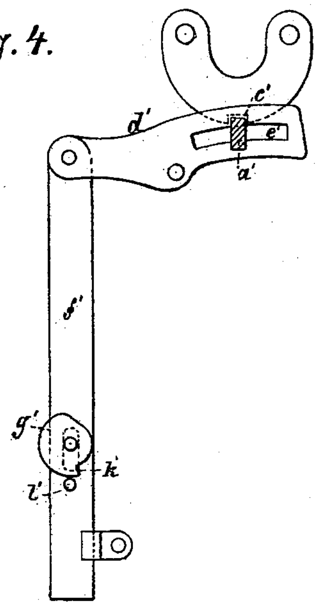


Fig. 5.

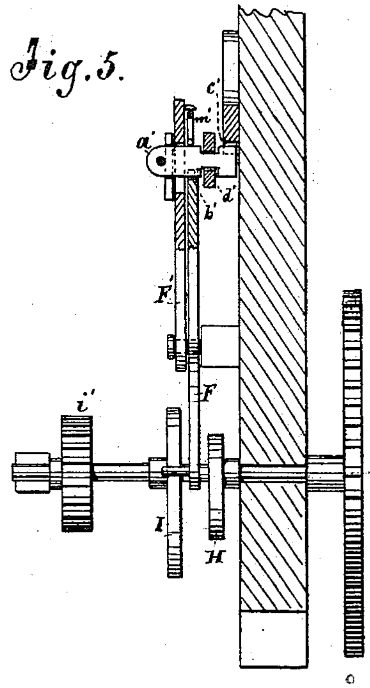


Fig. 6.

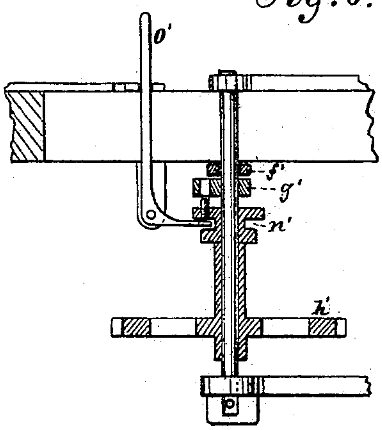


Fig. 7.

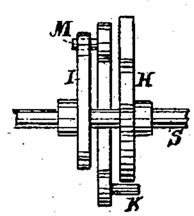
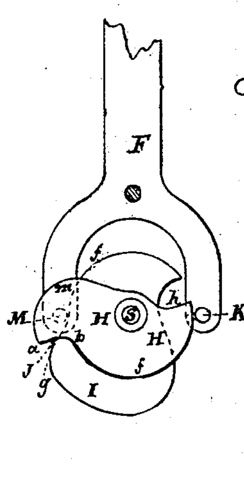


Fig. 3.



WITNESSES:

A Bennecnendorf
C Sedgwick

INVENTOR:

C B Cottrell

BY Munn & Co

ATTORNEYS.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CALVERT B. COTTRELL, OF WESTERLY, RHODE ISLAND.

IMPROVEMENT IN PRINTING-PRESSES.

Specification forming part of Letters Patent No. **167,227**, dated August 31, 1875; application filed July 11, 1874.

To all whom it may concern:

Be it known that I, CALVERT B. COTTRELL, of Westerly, in the county of Washington and State of Rhode Island, have invented a new and useful Improvement in Printing-Presses, of which the following is a specification:

The invention will first be fully described in connection with drawing, and then pointed out in the claims.

Figure 1 is a side elevation of a press, with a driving mechanism for giving uniform speed, and having my improved stopping and starting mechanism. Fig. 2 is a longitudinal sectional elevation, with the cylinder and bed placed a little to one side of the true positions to avoid hiding other mechanisms. Fig. 3 is a side elevation of the cams and the rocking bar or lever for stopping and starting the bed, said cams being reversed as compared with Fig. 2. Fig. 4 is a side elevation of some of the apparatus for effecting the double rolling motion. Fig. 5 is a sectional elevation of the double rolling contrivance. Fig. 6 is a horizontal section of the contrivance for connecting and disconnecting the double rolling-gear with the driving-gear; and Fig. 7 is a plan view of Fig. 3 inverted.

Similar letters of reference indicate corresponding parts.

I propose to drive the bed A by the well-known motion A′, in order to give it the maximum speed that the composition rollers will allow of, and at the same time to make the speed uniform from end to end; but any other means capable of the same effect may be employed. The bed turns the cylinder B by a toothed rack, C, on it, and a toothed wheel, D, on the cylinder, and disconnects from it to run back, while the cylinder rests by the toothless part E of the wheel D, stopping over the rack C. In order to stop the cylinder, which runs very fast, quickly and without shocks and noise, and without slowing the bed, and to start it and connect it with the rack in the same manner, I employ the crotched segmental lever F F′, a toothed segment, G, on the cylinder, and the cams H and I, the cam H having a very carefully-graduated part, J, whereon it catches the roller K of the segmental lever F just before the rack disconnects from the cylinder, which takes place at the end of the movement of the bed to the left, and slows it down to a complete stop, while the part of the cam from *a* to *b* passes the roller, the segment F being previously turned forward to the right, as indicated by the dotted lines L, by the part *m* of cam H, to engage the cylinder just before the rack disengages from it. The cylinder then rests in the position represented in Fig. 2 until the bed goes back to the right, during which time the circular parts *f* of both of the cams pass the rollers K and M without moving the segmental lever F, thereby locking the cylinder, and holding it to receive the paper. When the bed is ready to run back again under the cylinder, and the rack to engage with wheel D, the cams will have turned, so that roller M will be thrown forward to the right, and the segment to the left, by the part *g* of cam I, and roller K will drop into depressions *h* of cam H, which will start the cylinder, so that tooth *j* of the rack C will engage notch *k* of wheel D, and thus connect the rack and the cylinder. This cam I is also very carefully graduated in the part *g*, so that it works in unison with the rack for a short time at the starting, and after the rack and cylinder are engaged, and sustains the principal strain of quickly starting the cylinder, and gradually delivers it to the rack in a way to avoid a shock. The cam then simply allows the segment to run far enough with the cylinder to escape from the segment G; then the part *m* of cam H throws the segment forward again to the right, to be ready to catch the cylinder just before the rack escapes from it, as before, after which the operations will be in repetition of those above described.

This contrivance is entirely successful practically, enabling the press to be run as fast as the composition rollers will bear to be run, and making the capacity of a stop-cylinder press equal to that of a continuously-revolving press, or nearly so, thus enabling the printing of colored work to be done as fast as plain work. But as a further means of facilitating the stopping of the press, I also propose to employ a friction-brake, P, in combination with the friction-wheel Q on the cylinder, and a cam, R, on the cam-shaft S, so arranged that the brake will be thrown against the wheel at

the moment the cylinder disconnects from the rack. A stud-pin on the bed or rack and a stop or other contrivance on the cylinder may also be used in connection with these graduated cams and segments as a further means of insuring certain and reliable action, if preferred, and I will use them or not, as I may wish.

In order to throw out the cylinder and allow it to stop and remain at rest during each alternate operation of the bed, for what is called "double rolling"—that is, for working the inking-rollers double the amount they are worked at each operation, sometimes required in order to spread the ink as much as is needed for fine cut-work—I have made the segmental lever in two parts, F F′, and provided the catch *a′* in the part F′, for locking the two parts together when the cylinder is to be put in gear by dropping into the notch *b′* in the top of part F, and lifting out of said notch when they are to be disconnected, and also for locking part F′ to the frame to hold the cylinder in position, while the part F is kept in motion by the cams by rising up into a notch in plate *c′* on the frame; and for working this catch I have provided a rock-lever, *d′*, and connected it to the catch by a slot, *e′*, to allow the catch to move along the lever as the segment swings when the two parts are connected and have connected this lever to the rod *f′*, which, being depressed by the cam *g′*, which gears with the cam-shaft S by wheel *h′* and pinion *i′*, so as to have one motion to two of the cam-shaft, will, at each alternate movement of the cam-shaft S and bed, disconnect the cylinder, and allow it to stand during one revolution of the press; then, as the part *k′* of the cam passes the stud-pin *l′*, the spring *m′* will press the catch *a′* into the notch of part F′ of the segmental lever, and thus gear the cylinder with the bed again. The cam *g′* is put in or out of gear with the cam-shaft S by the clutch *n′*, attached to wheel *h′*, and has a lever, *o′*, for shifting it.

I am aware that a cam and a segmental lever are used with a stop-cylinder driven by a crank-motion, and having a tooth on it corresponding to segment G, for engaging the segmental lever. But in that case the object and effect are entirely different from what they are in my press; for instance, when the crank-driving mechanism is used it slows down and brings the cylinder to a stop, or nearly so, itself, the last tooth of the rack on the bed barely escaping from its tooth on the cylinder, so that if the cylinder should be left in that position there would be danger of the teeth of the bed catching those of the cylinder, when the bed returns under the cylinder again, and particularly when it comes into gear with the cylinder, especially if by the jar of the machine the cylinder should be slightly shifted out of place in one direction. Therefore the segmental lever is caused, in that case, to come into gear with the cylinder after or at the moment of disconnecting from the bed, and move it so that its teeth will be certain not to clash with the teeth on the bed, and also to bring the cylinder to the position for receiving the paper, and the cam and lever start the cylinder again to gear with the bed.

Now, my graduated cam and segmental lever take the cylinder while in full speed from the bed, which is also in full speed, and stop it, while the bed continues its motion at full speed, and they stop the cylinder, while the bed runs on, and without losing any time whatever on account of the stopping of the cylinder, as the beds do in all other stop-cylinder presses.

A′ A′ are air-springs, whose cylinders are on each end of the bed, while their stationary pistons are in corresponding positions on each end of the frame. These springs take up the momentum that is transferred thereto by the bed at each stoppage, and then retransfer the same at the start of bed on its return in the opposite direction, thus allowing but little lost motion, and enabling the machine to be run much faster than usual, and with much less than the ordinary motive power.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of the locking-catch *a′* with the divided segmental lever F F′ and rock-lever *d′*, substantially as specified.

2. The segmental lever composed of two parts, F F′, and a locking-catch, *a′*, in combination with rock-lever *d′* and notched plate *c′*, arranged to lock and unlock said parts, and also to lock the part F′, which gears with the cylinder, to the frame when disconnected from part F, all substantially as specified.

3. The slotted rock-lever *d′* and the cam *g′*, geared relatively to the cam-shaft as described, in combination with the catch *a′*, substantially as specified.

CALVERT B. COTTRELL.

Witnesses:
A. P. THAYER,
ALEX. F. ROBERTS.