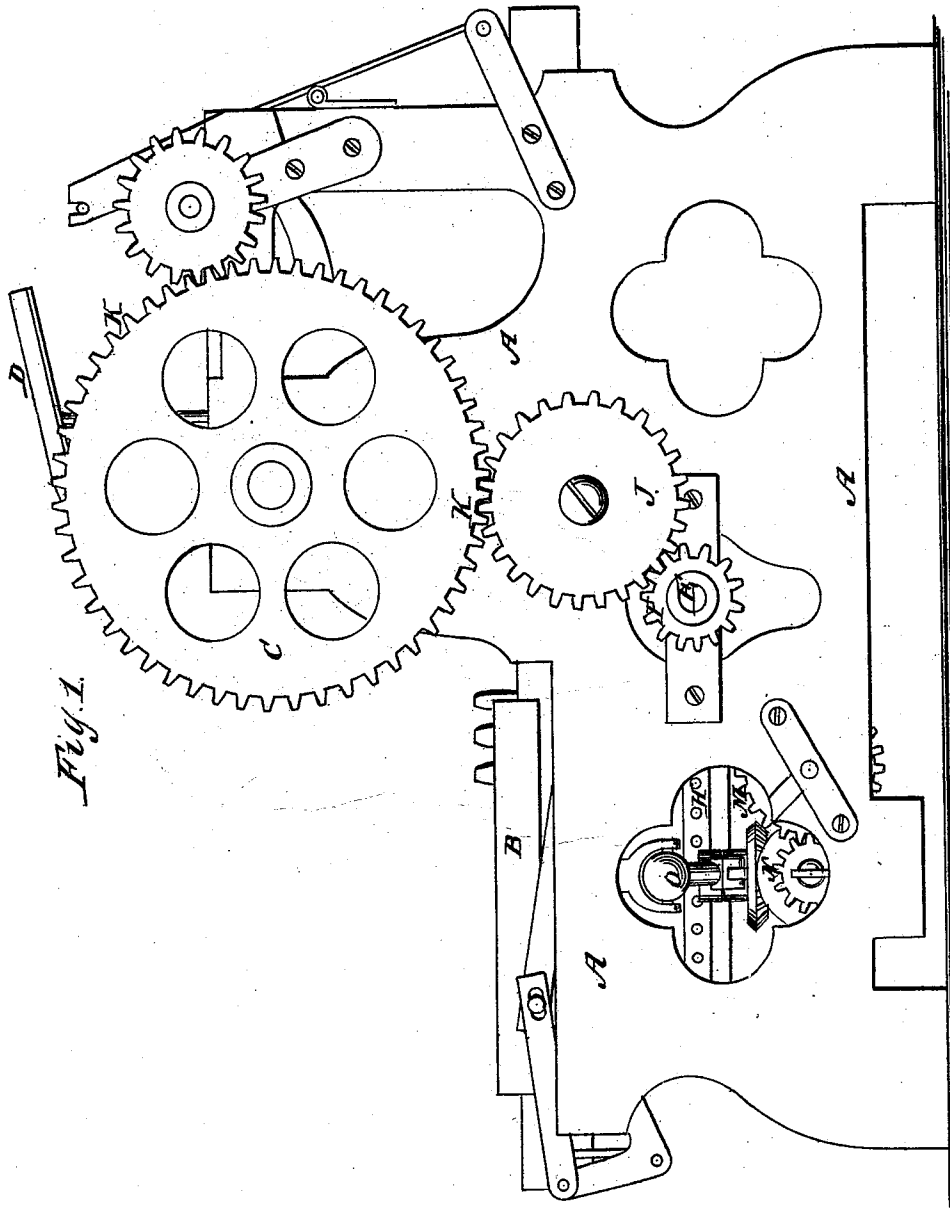


C. B. COTTRELL.
PRINTING-PRESS.

No. 172,974.

Patented Feb. 1, 1876.



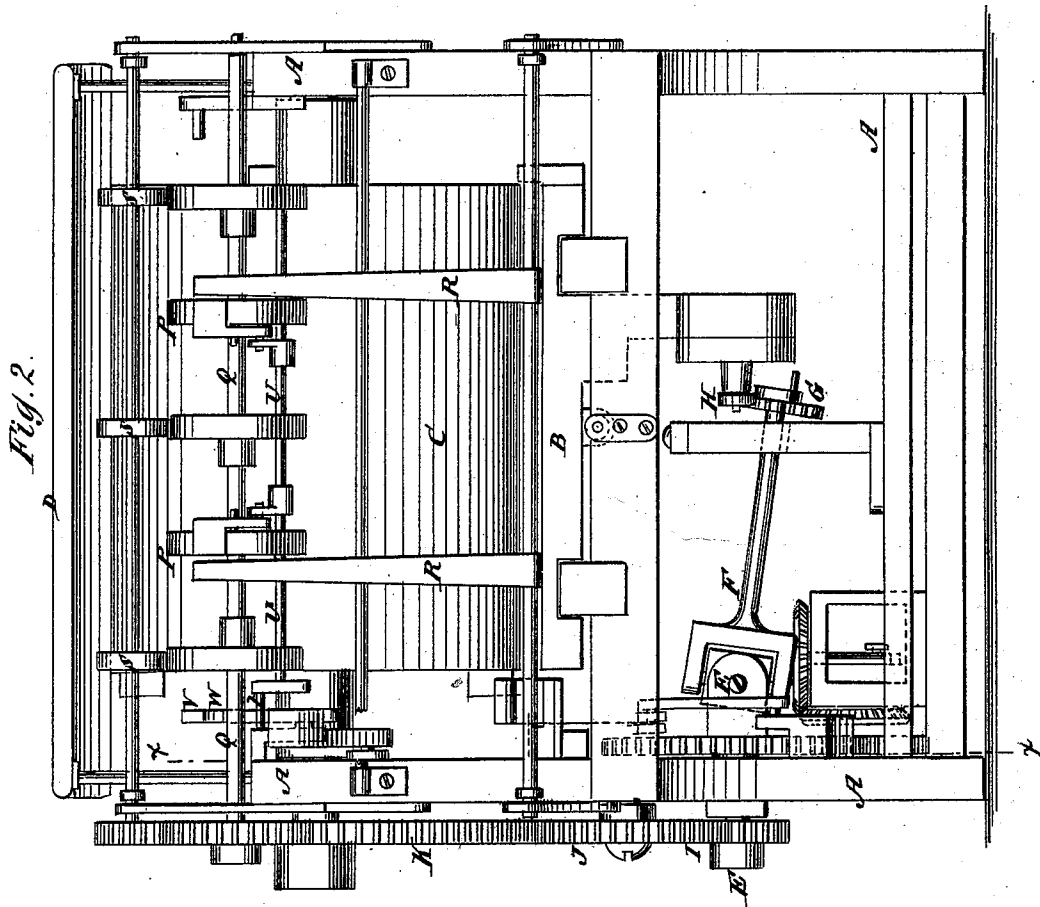
Witnesses:
A. W. Drizer
Jacob F. L. L.

Inventor:
C. B. Cottrell
My atty. J. M. L.

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Witnesses:
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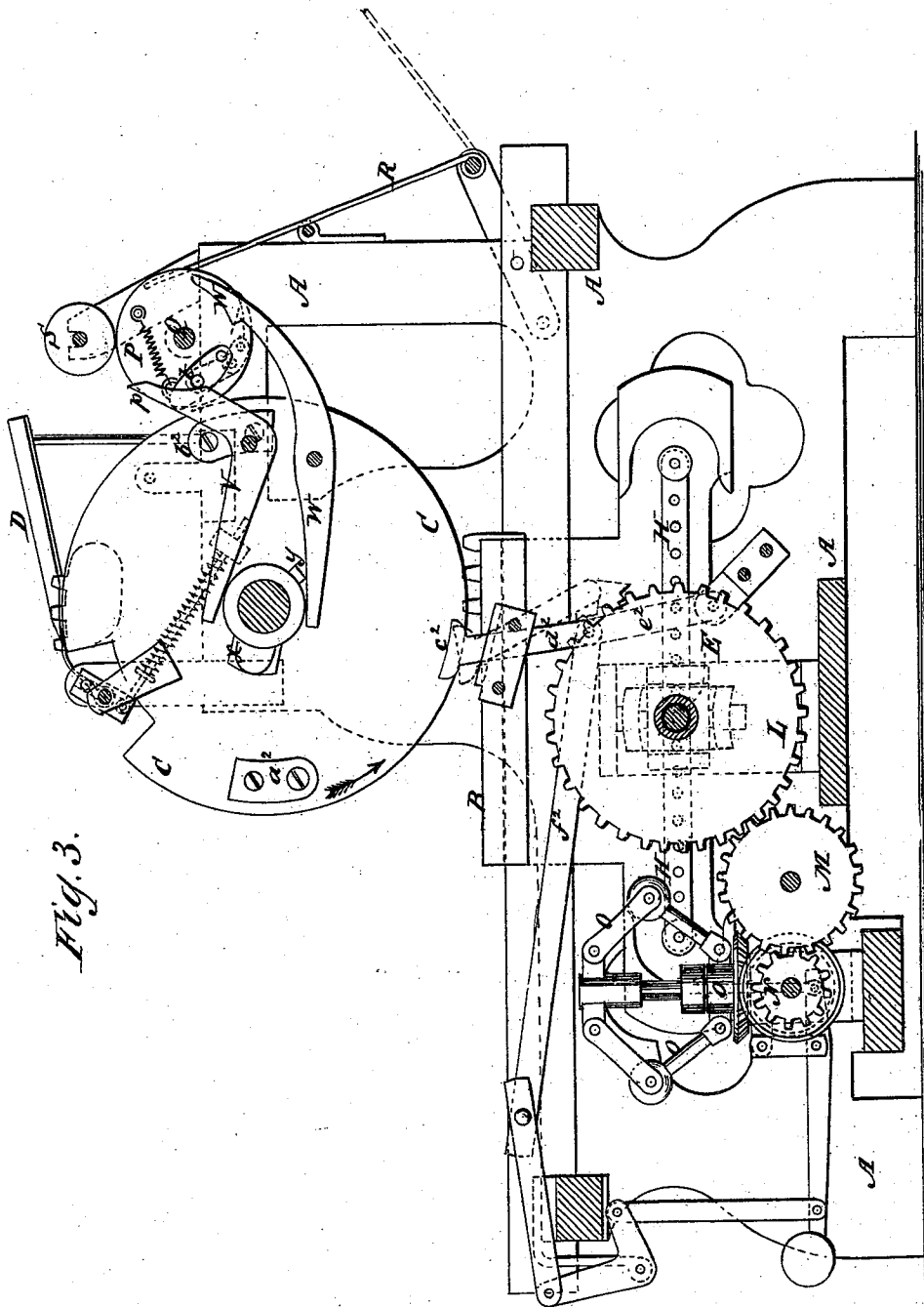


Fig. 3.

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A. H. Souza
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UNITED STATES PATENT OFFICE

CALVERT B. COTTRELL, OF WESTERLY, RHODE ISLAND.

IMPROVEMENT IN PRINTING-PRESSES.

Specification forming part of Letters Patent No. **172,974**, dated February 1, 1876; application filed November 27, 1875.

To all whom it may concern:

Be it known that I, CALVERT B. COTTRELL, of Westerly, Washington county, in the State of Rhode Island, have invented certain new and useful Improvements in Printing-Presses; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

In drum-cylinder presses as heretofore constructed there is a great deal of backlash in the gearing, resulting from the tendency of the drum or impression-cylinder to maintain a uniform and greater velocity than the bed is permitted to travel with at and near each end of the stroke of the latter; and this backlash not only induces to greater strain and wear and tear of the machine, but renders the work imperfect. In cut-work the imperfection is most damaging, the "overlays" being permitted to strike over.

It will be obvious to those familiar with the construction and operation of printing-presses that the retardation of the bed (by any of the usual appliances employed to check the velocity and take up the momentum) at the end of each stroke of the latter tends to shift the working sides of the teeth of the gearing, and thus occasions more or less strain and a great amount of backlash in the gears, which must necessarily induce to considerable jar and shock, and permit considerable striking over, all of which is most destructive of the machine and detrimental to perfection of work.

I propose to overcome all this striking over and imperfection of work, as well as the evil consequences to the mechanism of the principle of construction heretofore employed in such presses, by the adoption in, or use in connection with, such machines of some means for retarding the velocity of the drum or impression-cylinder at the same time that, and about to the same extent as, the bed is retarded, (at each end of its stroke,) and thus harmonizing the velocity of the drum to the irregular velocity of the bed, and keep the gears working always on the same sides of the teeth; and to this end and object my invention consists in the use, in combination with the drum, of a means for checking or retarding its velocity at the right times and to the proper extent to

make it run with about the same variable velocity as the bed, and thus avoid all backlash and any strain or jar in the working of the machine, and to keep the gears working always on one side of the tooth.

In carrying out this principle of construction it has been deemed most advisable to so devise the machine that the device for effecting the retardation of the drum shall not be brought into operation or effect when the machine is not running at its usual working velocity, as then the turning of the drum by hand-power, as is often necessary, will not be rendered any more difficult than heretofore. To accomplish this end is a further object of my invention, which further consists in combining the drum-retarding device or mechanism with the governor, or some running part of the machine, in such a manner that said device or mechanism will be set and held in an operative condition only when the machine has the motive power applied or is running at its usual working velocity.

My invention further consists in certain hereinafter-described improvements in the delivery mechanism of the press.

To enable those skilled in the art to make and use my invention, I will proceed to more fully describe the construction and operation of a printing-press involving my several improvements, referring by letters to the accompanying drawings forming part of this specification, and in which—

Figure 1 is a side elevation; Fig. 2, a back view; and Fig. 3, a vertical longitudinal section at the line *x x*, Fig. 2.

In the different figures the same part is designated by the same letter of reference.

A is the frame of the machine; B, the reciprocatory bed; C, the drum or impression-cylinder, and D the feed-table of a drum-cylinder press, these principal parts being constructed and arranged in about the usual manner. E is the main driving-shaft, which, through the medium of a pivoted shaft, F, pinion G, and double rack H, imparts to the bed B the proper motions, and which also, through the medium of a pinion, I, intermediate gear J, and gear-wheel K, imparts to the drum C the necessary rotatory motion. On the main shaft E is a gear, L, that engages with an in-

intermediate gear, M, which drives the spur-pinion N of the governor O. The griper-wheels P, for taking the printed sheet away from the drum, are arranged on a shaft, Q, mounted in the upper part of the main frame, as shown, and the fly R, for delivering the sheets, is arranged, as seen, so as to take the sheets as they pass out between the wheels P and rollers S.

The fly is operated in any usual manner, and the drum C is provided with the usual griper-fingers, for carrying the sheet round while receiving the impression.

The griper-wheels P make each three revolutions to one turn of the drum C; but the grippers of the former are operated only once during the three revolutions made, being opened by contact of the pin *t* of the griper-shaft U with the cam-like surfaces of the two levers V and W, which are each brought into proper position for use once during each revolution of the drum C by cams *x y* on the shaft of said drum, (and hence once during every three turns of the griper-wheels P.) On the drum C, at one end by preference, are secured or formed two projections, *a*² *b*², so located with reference to the circumference of the drum and the throw of the bed B that they will come successively into contact with a brake-block, *c*², just about at the times the bed is being checked up and reversing its direction of motion, (at each stroke of the bed,) and this brake-block *c*² is mounted or formed on the upper end of a bar, *d*², which is jointed to another bar, *e*², forming a sort of knuckle-joint, as illustrated. Extending from this joint is a pitman or rod, *f*², that is connected to the governor, so that when the press is running at its usual speed the brake-block will be drawn up to the position shown at Fig. 3 in full lines, causing the projecting portions *a*² *b*² of the drum to come into frictional contact with said brake just about the times the bed is being checked up, and so that when the press is not running full speed, the said brake-blocks will drop down into disuse, as shown by the dotted lines at Fig. 2.

It will be understood that by the means shown and just described the velocity of the drum C is checked up at the same time that the throw of the bed is checked, (at each end of the stroke,) and that, therefore, the irregular speed of the bed is made to harmonize with a similar irregular velocity of the drum, and that thus all backlash, and the consequent striking over, and all strain, concussion, and wear and tear on the machine, which would otherwise result from the natural tendency of the rotatory drum to keep traveling fast while the bed is slowed up suddenly, are overcome or avoided; and it will be seen that by combining the brake mechanism with the gov-

ernor, or some other part of the machine, in such a manner that the said mechanism will be automatically thrown into use or disuse, as the machine is either run by the usual motive power, or is only put in motion by hand, the unnecessary hinderance to the turning of the drum by hand, which would occur were the brake device arranged to always take effect, is avoided.

The general operation of the main parts of the press will, of course, be understood without particular explanations here.

It will be understood that, so far as the first part of my invention is concerned, any suitable mechanical appliance for checking up the drum, or taking up some of its momentum at the time the bed is (necessarily) being checked, so as to keep the teeth of the driving-gears always working on the same side, and so prevent all backlash, strain, and jar, will answer, and that this part of my invention is not limited by the particular devices shown, nor restricted to the described mode of carrying it out, in which the bringing into use of the drum-checking device is effected automatically, and only when the press has the usual motive power applied.

Of course one part or feature of my invention may be used with more or less advantage without the other features; and it will be understood that, in regard to the first part of my invention, the retardation or retarding of the cylinder is most important at such times as the printing operation is being performed.

Having so fully explained the construction and operation of a machine embracing my several improvements in the form I have so far practiced that any one skilled in the art can make and use printing-presses involving my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with the drum or impression-cylinder, means for intermittently checking the speed of said cylinder or retarding its velocity, substantially as and for the purposes described.

2. The combination of a brake device or other suitable means for intermittently checking or retarding the velocity of the rotatory drum with the governor, or some other movement of the machine, in such manner that the said drum-checking device will be brought into an operative condition only when the machine is running at its full or working speed, as hereinbefore set forth.

In testimony whereof I have hereunto set my hand and seal this 18th day of November, 1875.

CALVERT B. COTTRELL. [L. S.]

In presence of—

J. N. MCINTIRE,
JACOB FELBEL.