

(No Model.)

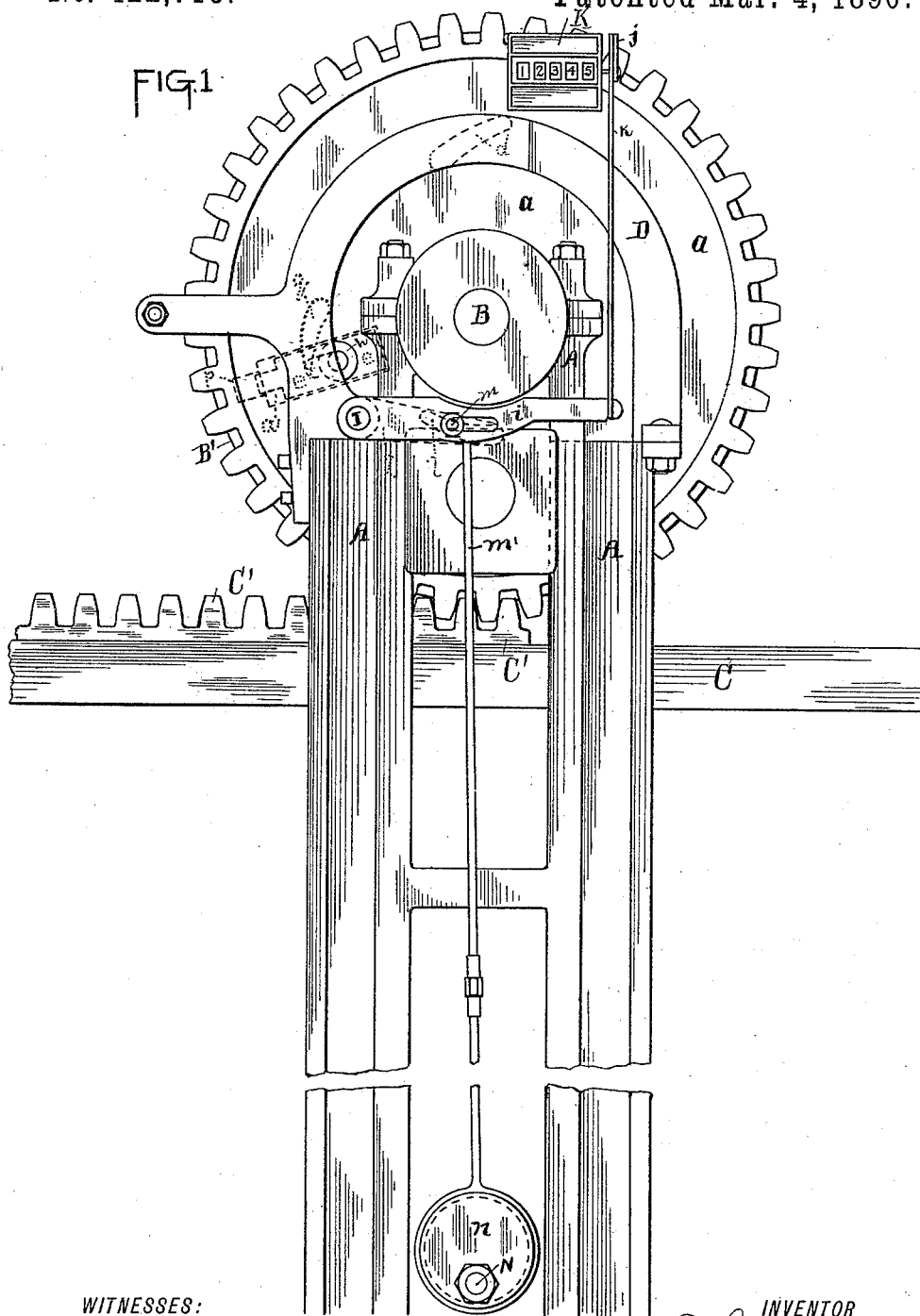
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J. W. BUTTERFIELD.

TWO REVOLUTION CYLINDER PRINTING PRESS.

No. 422,715.

Patented Mar. 4, 1890.



WITNESSES:

*Colman A. Ferry.*

*W. A. Shepherd*

INVENTOR

*John W. Butterfield.*

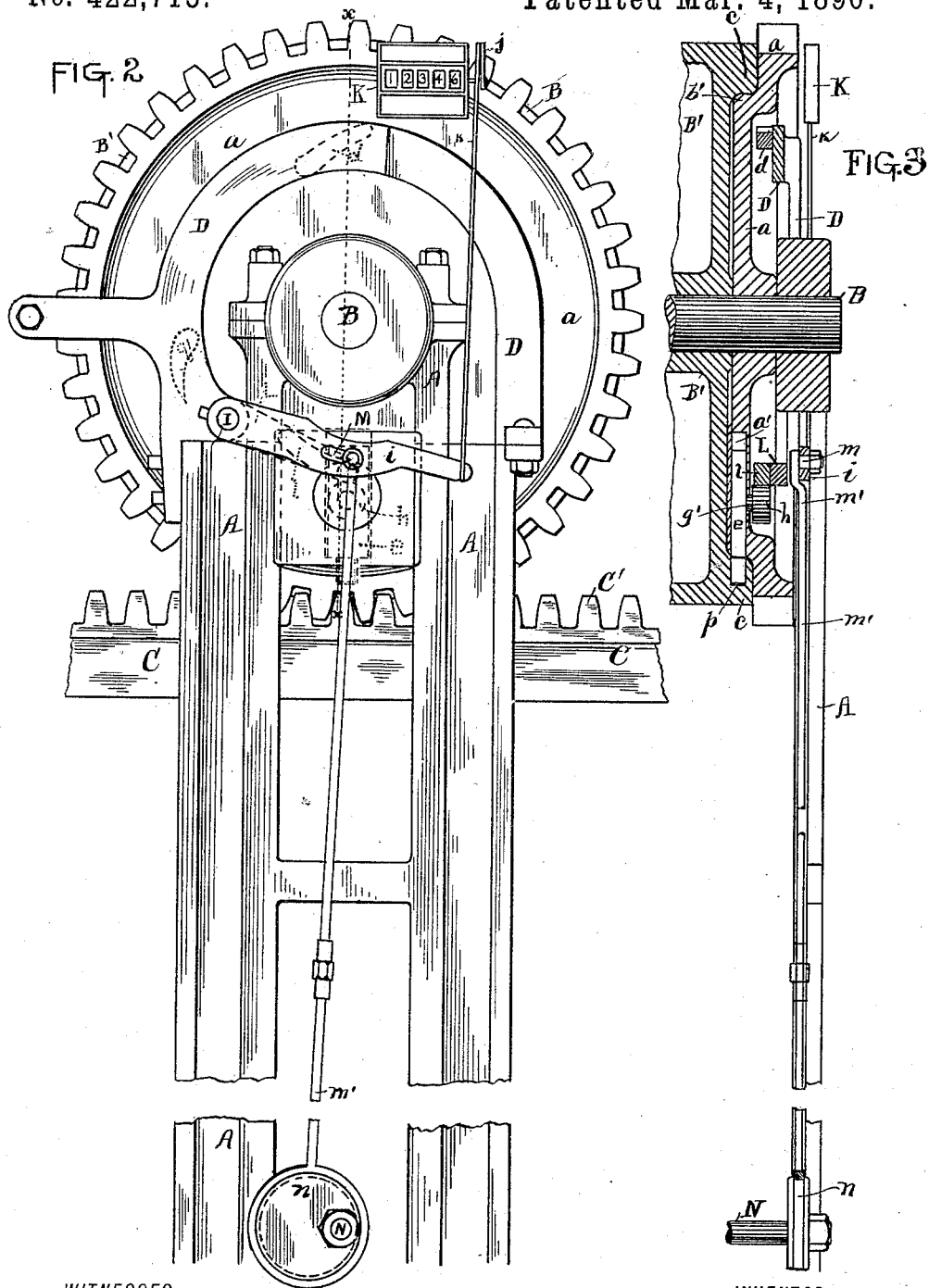
BY

*C. C. Stephens*

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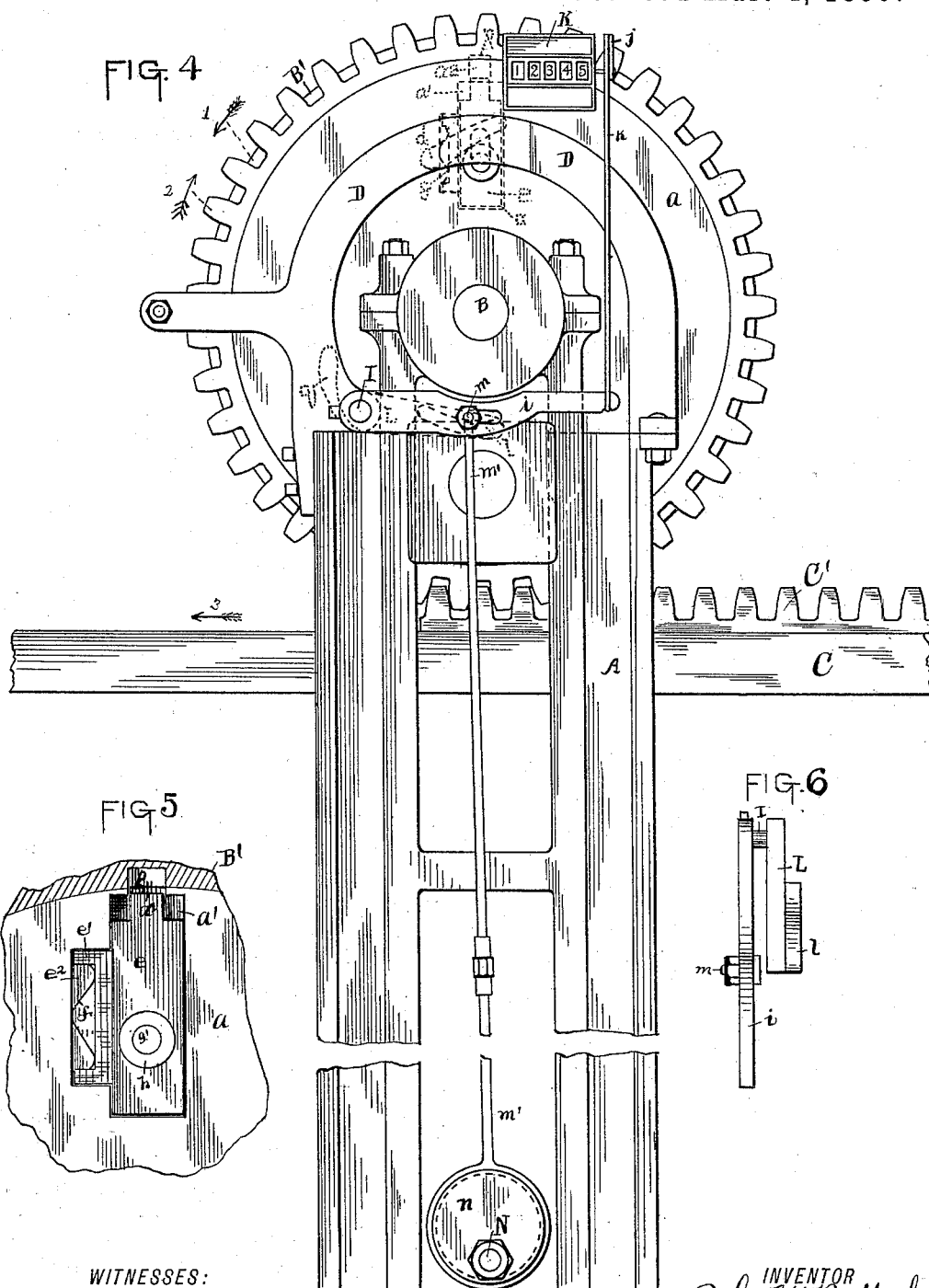
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WITNESSES:

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# UNITED STATES PATENT OFFICE.

JOHN W. BUTTERFIELD, OF COLUMBUS, OHIO.

## TWO-REVOLUTION CYLINDER PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 422,715, dated March 4, 1890.

Application filed September 9, 1889. Serial No. 323,410. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN W. BUTTERFIELD, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a certain new and useful Improvement in Two-Revolution Cylinder Printing-Presses, of which the following is a specification.

My invention relates to the improvement of registering devices for two-revolution printing-presses; and the objects of my invention are to provide two-revolution cylinder printing-presses with superior means for producing accurate registering in printing; to so construct said device as to prevent any lost motion of the parts; to combine therewith means for operating the impression-counting machine; to produce the same in a durable and simple form, and to admit of its attachment to the ordinary form of two-revolution cylinder-presses. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a portion of the frame of a printing-press having my improvements thereon, showing the bed-rack gear-wheel disengaged from the impression-cylinder. Fig. 2 is a similar view showing in dotted lines the position of the locking-key when the gear-wheel and cylinder are locked. Fig. 3 is a vertical section taken on line  $x x$  of Fig. 2. Fig. 4 is a side elevation of said frame-work, showing in dotted lines the position of the locking-key immediately after its disengagement from the impression-cylinder. Fig. 5 is a view in detail of a portion of the rear face of the rack gear-wheel, showing the locking-key therein. Fig. 6 is a plan view in detail of the counting-machine - operating lever and the cam-arm connected therewith.

Similar letters and figures refer to similar parts throughout the several views.

A represents that portion of the vertical frame-work of a two-revolution cylinder printing-press which supports in the usual manner in the upper portion the cylinder-shaft B.

C represents the movable horizontal bed which carries in the usual manner the printing-forms.

To prevent confusion, in illustrating my device I have omitted considerable of the

frame-work of the press, which does not form a part of my invention.

$a$  represents a cog or gear wheel loosely mounted on the shaft B, adjoining one end of the impression-cylinder B'. This gear-wheel has its teeth projecting slightly beyond the periphery of said cylinder and has formed on its rear side adjoining its outer edge a circular shoulder  $b'$ , which is surrounded by and forms a seat for a forwardly-projecting circumferential flange  $c$ , formed on the end of the cylinder B'.

D represents a yoke having the general form of an inverted letter U, the arm ends of which are secured to the upper portion of the vertical standard of the frame A, from which points said U-shaped yoke extends upwardly and curves over the bearing of the cylinder-shaft B about midway between said bearing and the toothed surface of the gear-wheel  $a$  and on the outer side of the latter.

Formed on the rear face of the wheel  $a$  in the body thereof is an oblong depression  $a'$ , which is continued outward by a somewhat narrower depression or neck  $a''$ , which opens at the periphery of the shoulder  $b'$ . Seated within this depression  $a'$  is an oblong key  $e$ , having a tongue-shaped outer end. Although this key  $e$  is loosely fitted within the depression  $a'$ , it is held in contact with one side thereof by means of a gib  $e'$ , located within a side offset  $e''$  of said depression. This gib  $e'$  is at all times held in contact with the key  $e$  by means of a metallic spring-strip  $f$ , made to bear between the outer side of said gib and the outer wall of said depression-offset. Projecting forwardly from near the center of the length of the key  $e$  through a slotted opening  $g$  is a pin  $g'$ , which carries loosely on its outer end a small friction-roller wheel  $h$ .

Formed on the rear side of the yoke D and in the upper portion thereof is a cam or lug  $d$ . This cam is curved upwardly from the bottom of the yoke-arm to the upper side thereof, as shown.

Fixed on the outer projecting end of a pin I, the latter bearing loosely in the lower portion of the yoke D in that arm nearest the forward end of the press, is one end of a lever-arm  $i$ , which, extending transversely across the frame A on the outer side thereof and beneath the shaft-bearing, has its remaining end

connected with the usual crank-arm or operating-lever *j* of the impression-counting device K by means of a rod *k*. This rod *k* has its upper end pivotally connected with said counting-device lever and is preferably linked to the arm *i* at its lower end. The counting device K may be of any desired or well-known form, and is supported in any desirable manner in front of the upper portion of the gear-wheel *a*. The inwardly-extending pin or short shaft I has fixed on its inner or rear end behind the frame A an arm L, the latter being somewhat shorter than the arm *i* and running approximately parallel therewith. Secured to or formed with said arm L near its outer end is a cam or lug *l*. The lever-arm *i* is provided at the center of its length with an elongated slot M, through which passes loosely and within which is held a short pin *m*, the rear projecting end of which is connected with a downwardly-extending eccentric-rod *m'*. This rod *m'* has its lower end secured to an eccentric wheel or disk *n*, eccentrically mounted on one end of the usual shaft N, which is supported in the lower frame-work of the press and which operates to raise and lower the impression-cylinder in the usual manner. The bed C is provided on that side of the press on which is located the wheel *a* with a rack C', the teeth of which are adapted to mesh with the teeth of the wheel *a*.

The cylinder B' revolving in the usual manner in the direction indicated by the upper arrow 1 in Fig. 4 of the drawings, the rack C' and its bed C moving in the direction indicated by the arrow 3, the wheel *a* being in such position that its key-depression *a'* is in the upper portion thereof, and the key *e* being seated in the inner end of said depression, as shown in Fig. 4, it will be seen that the loosely-mounted wheel *a* will, by its engagement with the rack C', be rotated, as indicated by arrow 2, in the opposite direction from the impression-cylinder. This motion will be continued until the key *e* and its roller have passed beneath and beyond the cam-arm L and its cam *l* to the position shown in the dotted lines in Fig. 1 of the drawings. At this point the bed begins to travel back in the usual manner and operates to reverse the motion of the wheel *a*. At this time the impression-cylinder is lowered in the usual manner by the shaft N, the motion of the latter operating through its wheel or disk *n* and the connection therewith of the rod *m'* to sufficiently lower the lever-arm *i* to operate the impression-counting-machine lever *j* through the rod *k*. This lowering of the lever-arm *i* will operate to lower the cam-arm L to such position as to bring into contact with the cam-lug *l* thereof the roller *h* of the key *e*. The pressure thus produced on said key-roller will, as shown in Fig. 2 of the drawings, operate to drive downward the key *e* until its tongue enters a mortise or depression *p*, formed in the inner side of the circumferential flange *c* of the impres-

sion-cylinder. In this manner the cylinder and gear-wheel become locked together as the printing process is begun, and said wheel is carried with said cylinder until the key *e* is again in the upper portion of the gear-wheel, when it will be released from engagement with the cylinder by the contact of its roller *h* with the cam *l*, as shown in dotted lines of Fig. 4 of the drawings. The usual movement of the shaft N will at about this time operate to elevate the arm *i* and cam-arm L to the position shown in Fig. 4 of the drawings. The herein-described upward and downward movement of the lever-arm *i* will, through the rod *k*, produce the same movement of the counting-machine lever-arm and attain the same results in said counting-machine as have heretofore been accomplished by a direct connection of the shaft N and the lever *j*. The gear-wheel having been turned to the position shown in Fig. 4 of the drawings, as above described, and released from connection with the impression-cylinder, and the motion of the bed C being again reversed in the usual manner, it will be seen that the above-described opposite and corresponding movements of the gear-wheel and impression-cylinder will be repeated.

By the above-described construction and operation it will be seen that during the printing process a positive connection is produced between the bed and the impression-cylinder, and that the times said connections are made exactly correspond in each impression, thus producing a uniform register of the print.

As shown in dotted lines of the drawings, a cam-lug *q* may be made to project from the rear side of the yoke at a point in close proximity to the friction-roller *h* when the form-bed has completed its forward movement.

In case the operation of locking together the impression-cylinder and gear-wheel has just been completed, and it is desired to back the impression-cylinder for any purpose, the locking-key may be again withdrawn from its socket by backing the impression-cylinder until the friction-roller *h* comes into contact with said cam *q*, which contact will operate to force the key upward.

It will be observed that by the construction herein described but slight wear on the parts will be produced and that no lost motion is allowed.

The mechanism above described is of such construction as to admit of its attachment to the frame-work of any two-revolution cylinder printing-press in such manner as to prevent its interference with the operation of other parts of the press.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a two-revolution printing-press, the combination, with the press-frame and its impression-cylinder B, having key-socket *p*,

traveling bed-plate C, rack C', and frame-yoke D, the latter having cam-arm L and cam *d*, of gear-wheel *a*, loosely mounted on the cylinder-shaft, and its key *e*, the latter adapted  
5 to be driven into engagement with and released from engagement with the key-socket *p* by contact with cams L and *d*, substantially as described.

2. In a two-revolution cylinder printing-  
10 press, the combination, with the frame-work of a two-revolution cylinder-press, its printing-cylinder B', the latter having flanges *c* and key-socket *p*, and traveling bed C, having rack C' and counting device K, of gear-wheel *a*,  
15 loosely mounted on the cylinder-shaft, its

key-depression and sliding key *e*, supporting, as described, friction-roller *h*, said gear-wheel meshing with bed-rack C', yoke D, supported on said press-frame, yoke-cam *d*, pivoted pin I, supporting, as described, slotted lever-arm 20 *i* and cam-arm L, eccentric-rod *m'*, wheel *n*, mounted eccentrically on shaft N, and rod *k*, connecting the impression-counting-device lever with lever-arm *i*, substantially as described.

JOHN W. BUTTERFIELD.

In presence of—

BARTON GRIFFITH,  
C. C. SHEPHERD.