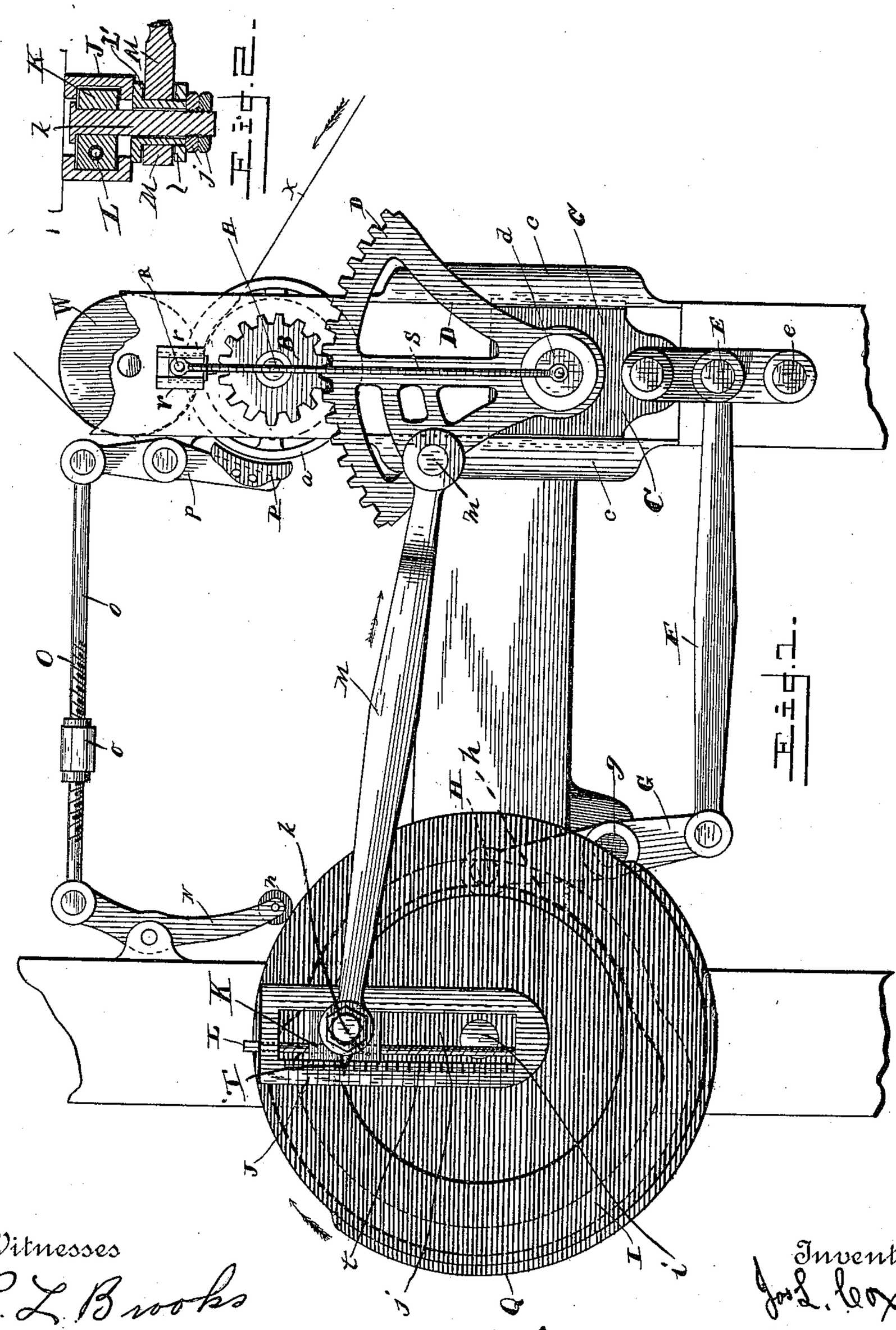
(No Model.)

J. L. COX.

PAPER FEED MECHANISM FOR PRINTING PRESSES.

No. 438,528. Patented Oct. 14, 1890.



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PAPER-FEED MECHANISM FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 438,528, dated October 14, 1890.

Application filed November 1, 1889. Serial No. 328,944. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH L. COX, of Battle Creek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Paper-Feed Mechanism for Printing-Presses; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification, in which—

Figure 1 is a detail side elevation of my improved paper-feed devices for printing-presses. Fig. 2 is a detail view.

This invention is an improvement in paper-feed-regulating devices for reciprocating web-printing presses; and its objects are to provide means for feeding the paper intermittently from the paper-roll to the press in suitable equal lengths or quantities, and to so construct the parts that they can be adjusted to feed different lengths of paper without varying the speed of the press, and to take up all momentum of the feed-roll automatically so as to avoid tearing of the paper, all of which objects I accomplish by the mechanism hereinafter described, and illustrated in the drawings.

Referring to the drawings by letter, A designates the shaft of a paper-feed roll mounted in suitable bearings in the frame-work of the press, and upon this shaft is a brake-wheel *a* and on its extremity a pinion B.

Below pinion B is a vertically-movable block C, moving in guides *c c* on the frame of the press and having a projecting stud *d*, upon which is journaled the hub of a vibrating rack D, the teeth of which are adapted to be engaged with the pinion B, as indicated in the drawings and hereinafter described. This block C is upheld and vertically adjusted by means of a toggle-joint E, one member of which is connected to the block and the other end to a stud *e* on the main frame.

The toggle-joint is operated by means of a rod F, that is connected to the joint and one arm of a lever G, which is pivoted on a stud *g*, secured to the main frame, and H is a stud or roller on the other arm of lever G, which engages a cam-groove *h* on or in the inner face of a disk I, which is mounted on a shaft *i*, journaled in the main frame to one side of the paper-feed rolls, and is driven by connections with the main shaft, (not shown,) so speeded that said disk makes one revolution for each impression made during the operation of the press. Upon the outer face of said disk is fixed a frame J, which is radial to the axis of the disk and extends across the center thereof at one end and nearly to the periphery of the disk at the other.

K designates a block, adjustably mounted in frame J, and adjusted therein by means of a screw-rod L, secured longitudinally of the frame J and passing through a threaded opening in block K and journaled in the end pieces thereof, its outer end projecting beyond the frame and adapted to be engaged by a wrench or key to turn rod L, by which the position of block K can be adjusted with great accuracy, as is evident. The block is guided by flanges or grooves at its sides engaging grooves or flanges in the side rails of the frame J, as usual.

From block K and to one side of rod L projects a wrist-pin *k*, threaded at its extremity, and on which is placed a sleeve L′, the inner edge of which is preferably flanged to bear against the face of frame J, and on said sleeve is journaled the end of a pitman M, which is confined thereon by a collar *l* and by jam-nuts *j j* on the end of pin *k*, which when tightened forces sleeve L′ inward and draws block K outward, thereby tightly binding these parts to the side pieces of frame J and locking the wrist-pin in position thereon, relieving rod L from strain. The other end of pitman M is connected to a pin *m* on rack D, so that said rack is oscillated by the rotation of disk I.

P designates a brake-shoe, adapted to engage wheel *a* and mounted on one end of a lever *p*, pivotally mounted on a stud secured to the main frame. The other end of the lever P is connected by a jointed rod O with one arm of a lever N, which is pivoted on a stud of the main frame beside disk I, and the other end of which engages the periphery of said disk, which has a cam-surface Q extending around one-half of its periphery. Lever

N, preferably, has a roller *n* in its end to ride on the periphery of the disk. Rod O is in two sections united by a swivel-nut *o*, by which its length can be regulated.

W is a paper-feed roll co-operating with the roll on shaft A, and X is the portion of the web of paper passing between said rolls.

R is a latch playing between guides *r r*, secured to the main frame above pinion B, and S is a rod connected to said latch and to the pin *d* of block C, as shown, so that as this block is raised or lowered latch R is similarly actuated and thrown into or out of engagement with the teeth of pinion B.

The cam *h* is arranged so that during one-half a revolution of disk I rod F is thrown forward and during the remainder of the revolution is drawn backward, thereby shifting block C up or down and with it rack D, the play of the block being sufficient to engage and disengage rack D from pinion B. At the moment the rack D descends rod *s* draws down latch R, which engages the pinion B and locks the paper-shaft until the rack is thrown upward again into engagement with the pinion, when the latch is simultaneously disengaged therefrom. It will be observed that the cam is such that rack D is in engagement with pinion B during its movement in one direction only, and is out of engagement therewith while returning to its original position or reversing. During the time the sector and pinion are engaged the paper-feed rolls are actuated and turned just so far in the proper direction only as is sufficient to draw the requisite length of paper from the paper-roll and feed it to the press-rollers.

The throw of rack D is of course regulated by the position of wrist-pin *k* in respect to the axis of disk I. By shifting this pin to the center of the disk no movement will be imparted to pitman M and rack D, and by shifting the pin toward the periphery of the disk movement is imparted to the rack, increasing in length of stroke as the pin is set nearer to the periphery of the disk.

The block K is provided with a pointer T, which moves over an indicating-scale *t* on the side of frame J, and this scale is calculated with respect to the toothed surface of rack D and periphery of pinion B and of the paper-feed roll on shaft A, so that the operator can by observing the mark on the scale indicated by the pointer readily see what movement will be given to the rack D or what length of paper will be drawn into the press by the paper-rolls for each revolution of disk I.

The cam-surfaces that actuate the devices for raising and lowering block C in line with the frame J and the parts are so adjusted that when the wrist-pin *k* on said frame is at the "dead-centers" of its revolution, which is when the wrist-pin *k* is in line with the shaft *i* and pin *m*, lever G will be shifted at that moment, and thus rack D raised or lowered while it is momentarily stopped, or during the short interval while its motion is being reversed. The adjustment of the parts will be easily understood from the drawings. The pitch of the teeth of the rack and pinion—*i. e.*, the difference in width of the space between the points and bases of the teeth—materially assists in enabling the rack to be shifted quickly and readily, as described, without wear or binding of the teeth, since as the rack recedes from the pinion the points of its teeth have more play between the points of the teeth of the pinion, and should the rack have a slight motion imparted as the wrist-pin *k* begins to pass the dead-center there is no danger of the pinion B being turned thereby before the rack is properly thrown out of or into gear.

Cam Q is so formed on the disk I that it operates lever N and applies the brake P through the described connections just a moment before the rack is thrown out of engagement with pinion B, the brake positively taking up all centrifugal gravital momentum of the paper-roll shaft A, so that this shaft is only rotated by the positive action of the rack and pinion, and the cam Q releases lever N and the brake at the instant the rack is thrown upward into mesh with the pinion. By this means the pinion is prevented from turning while disengaged from the rack and possibly causing breakage of teeth of the rack or pinion by their impinging against each other instead of intermeshing.

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

1. In a printing-press, the combination of a feed-roll, a pinion thereon, and a rack and a locking-latch engaging said pinion with a cam-disk and pitmen and their connections, substantially as described, for reciprocating said rack and automatically throwing it into engagement with the pinion when moving in one direction, and for disengaging it therefrom when moving it in the opposite direction, and the devices for actuating said latch to lock the pinion when the rack is disengaged therefrom, substantially as and for the purpose described.

2. In a printing-press, the combination of a feed-roll, a pinion on the shaft thereof, and a rack engaging the same with mechanism, substantially as described, for reciprocating said rack and automatically throwing it into engagement with the pinion during one movement thereof, and for disengaging it therefrom during its reverse movement, and an automatically-actuated brake for stopping the movement of the roll and pinion at the moment of disengagement of the rack therefrom, substantially as described.

3. The combination of a feed-roll and a pinion on the shaft thereof, an oscillating rack engaging the pinion, and a cam-disk and connections for reciprocating said rack with a vertically-movable block carrying said rack, a toggle-joint supporting said block, and the

levers and the cam on said disk to operate said joint, substantially as described.

4. The combination of the feed-roll, its pinion and a rack engaging the same, a revoluble frame carrying an adjustable wrist-pin, and a pitman connecting said pin and rack with the toggle-joint supporting said rack and the mechanism, substantially as described, for automatically operating said toggle-joint to throw said rack into and out of engagement with the pinion, for the purpose substantially as described.

5. The combination of a feed-roll, a pinion thereon, a rack engaging said pinion, and a locking-bolt adapted to engage said pinion with mechanism, substantially as described, for reciprocating said rack and automatically engaging it with and disengaging it from the pinion, and for actuating said bolt to lock the pinion when the rack is disengaged therefrom, and an automatically-actuated brake for stopping the movement of the roll at the moment of disengagement of the rack and pinion, substantially as described.

6. The combination of the roll and pinion thereon, the segmental rack engaging said pinion, the vertically-movable block carrying said rack, and the toggle-joint supporting said block with the cam-disk and connections for operating said joint and the pitman operating said rack from said disk, and the locking-latch operated from the block to engage the pinion, substantially as specified.

7. The combination of the roll and pinion thereon, the segmental rack engaging said pinion, the vertically-moving block carrying said rack, and the toggle-joint supporting said block with the cam-disk and connections for operating said joint and the pitman operating said rack from said disk, and the bolt adapted to engage the pinion and actuated by a rod connected to said block, substantially as described.

8. The combination of the roll and pinion thereon, the segmental rack engaging said pinion, the vertically-moving block carrying said rack, and the toggle-joint supporting said block with the cam-disk and connections for operating said joint and the pitman operating said rack from said disk, and the brake mechanism operated from said cam-disk to stop rotation of the roll when the rack is disengaged therefrom, substantially as described.

9. The combination of the roll and pinion thereon, the segmental rack engaging said pinion, the vertically-moving block carrying said rack, and the toggle-joint supporting said block with the cam-disk and connections for operating said joint and the pitman operating said rack from said disk, the brake mechanism operated from said cam-disk to stop the rotation of the roll when the rack is disengaged therefrom, and the bolt adapted to engage said pinion actuated by a rod connected to said block, substantially as specified.

10. The combination of the feed-roll, the pinion and brake-wheel thereon, and the rack D, engaging said pinion, with the block C, toggle E, and the cam-disk I, and connections between said cam-disk and toggle-joint, and the brake-shoe operated from said disk, all constructed and arranged to operate substantially as and for the purpose described.

11. The combination of the feed-roll, the pinion thereon and the rack D, engaging said pinion, with the block C, toggle E, and the cam-disk I, and connections between said cam-disk and toggle-joint, and the frame J, secured to said disk, the adjustable block K, and the pitman M, connecting said block and rack, all substantially as described.

12. The combination of the feed-roll, the pinion thereon, and the rack D, engaging said pinion, with the block C, toggle E, and the cam-disk I, and connections between said cam-disk and toggle-joint, and the frame J, secured to said disk, the adjustable block K, and the pitman M, connecting said block and rack, and the bolt R and rod S, substantially as described.

13. The combination of the feed-roll, the pinion thereon, and the rack D, engaging said pinion, with the block C, toggle E, and the cam-disk I, and connections between said cam-disk and toggle-joint, and the frame J, secured to said disk, the adjustable block K, and the pitman M, connecting said block and rack, and the lever N, actuated by said disk, the rod O, lever *p*, brake-shoe P, and brake-wheel *a*, substantially as specified.

14. The combination of the feed-roll, the pinion thereon, and the rack D, engaging said pinion, with the block C, toggle E, and the cam-disk I, and connections, between said cam-disk and toggle-joint, and the frame J, secured to said disk, the adjustable block K, and the pitman M, connecting said block and rack, and the lever N, actuated by said disk, the rod O, lever *p*, brake-shoe P, and brake-wheel *a*, and the bolt R and rod S, substantially as and for the purpose described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

JOSEPH L. COX.

Witnesses:
A. E. DOWELL,
P. L. BROOKS.