

No. 725,414.

PATENTED APR. 14, 1903.

A. CRAWLEY.
REVERSING MECHANISM.
APPLICATION FILED JULY 23, 1902.

NO MODEL.

Fig. 1.

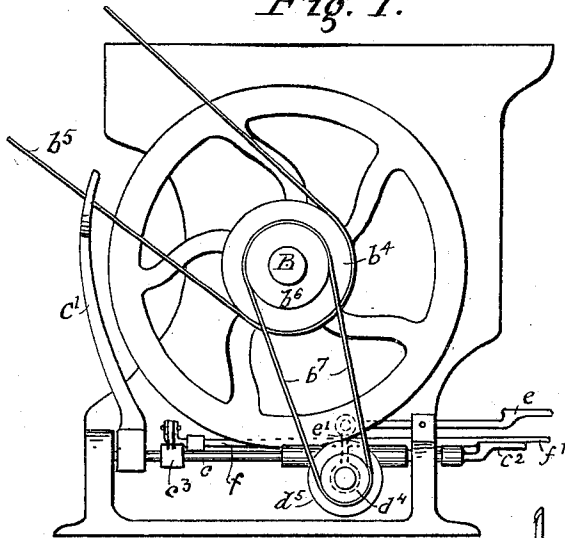


Fig. 3.

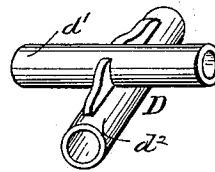


Fig. 2.

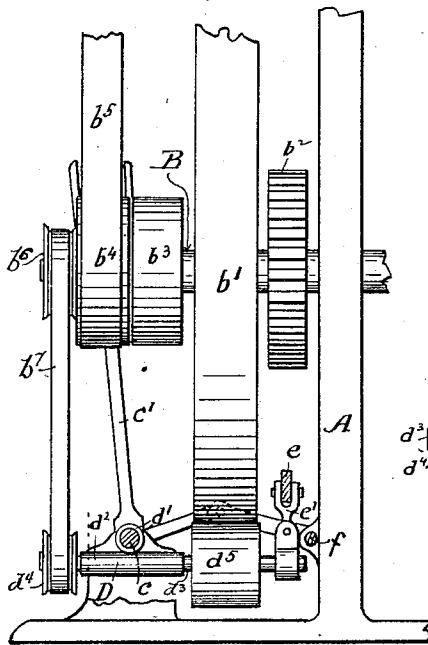
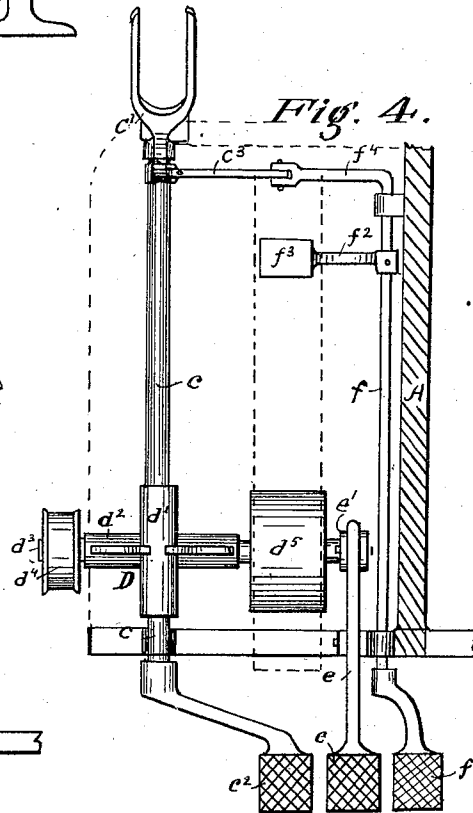


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

ARTHUR CRAWLEY, OF ARLINGTON, OHIO.

REVERSING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 725,414, dated April 14, 1903.

Application filed July 23, 1902. Serial No. 116,681. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR CRAWLEY, a citizen of the United States, residing at Arlington, in the county of Hamilton and State of Ohio, have invented new and useful Improvements in Reversing Mechanism for Machinery, of which the following is a specification.

My invention relates, primarily, to reversing devices for machines wherein adjustment of the work to the machine is required as the condition of perfect operation. To attain this end, partial reversal of the movement of the machine is often necessary and is generally accomplished by hand upon some wheel or moving part. Illustrations of such machines where such reversal is necessary will readily occur—for instance, in book rounding and backing machines, in which the work is to be first properly adjusted and tested by a partial movement of the machine to bring the work close to the rounding-bar and back again without actual contact, or in printing-presses, where like adjustments and tests are required before starting the machine in full operation. In reversing such machines it has been customary to use the hands for this purpose; but this is inconvenient, for the double reason that in most cases it is necessary to hold the work in position by hand, and this operation is therefore “unhandy,” and also because in thus grasping and operating the parts the hands are soiled by the oil, &c., which accumulates on the parts to be moved, and this soils the work when touched by the soiled hands. To remedy these inconveniences, I provide a means whereby the operator can reverse the operation of the machine by means of the driving power controlled by the foot, thus leaving the hands entirely free to adjust the work without distracting attention therefrom; and my invention consists in the parts and the constructions and combinations of parts which I will hereinafter describe and claim.

To more completely illustrate my invention, I herein show and describe its application to a book rounding and backing machine, in which machine the construction involves a fly-wheel adjacent to the frame, by the movement of which these minor adjustments are usually effected.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the frame of a book backing and rounding machine, showing the fly-wheel and the belt-shifting, braking, and reversing devices in connection therewith. Fig. 2 is a partial front elevation of the machine-frame with parts sectioned to show construction; Fig. 3, a perspective view of the swiveled bearing for carrying the friction gear-shaft; Fig. 4, a plan view of the said swiveled bearing shown with the devices indicated in Fig. 1 in relative position.

Referring now to the drawings, A designates the general supporting-frame of the machine to which my invention is applied; B, a support or stud projecting outward from the frame. Upon the stud are the fly-wheel b^1 , a spur-gear b^2 , attached thereto, and fast and loose driving-pulleys b^3 b^4 , the frames connected to the fly-wheel and the latter running upon the stud. From the fast and loose pulleys b^3 b^4 a belt b^5 extends to the main-line shaft and driving-pulleys (not shown) as the initial source of driving power for the operation of the machine.

In the machine selected for the illustration of my invention a rock-shaft c is journaled across the bottom of the frame A beneath and transversely to the stud B, carrying at the rear end an upwardly-extended fork c^1 , whose jaws extend at the sides of the belt b^5 . The rock-shaft carries at the front end a foot-lever c^2 , operating to shift the belt b^5 to the loose pulley b^4 . A second connection, presently to be described, enables the operator to shift the belt at will between the fast and loose pulleys b^3 b^4 .

Taking advantage of the convenient position of the rock-shaft c in the present case, I swivel thereon a bearing-frame D, consisting of two sleeves united transversely—one, as d^1 , to swivel and support the frame upon the rock-shaft c , acting as a pivot, and the other, as d^2 , being a journal-bearing for a short counter-shaft d^3 , carrying at one end a grooved or flanged belt-pulley d^4 and at the other a friction-wheel d^5 . These parts are so proportioned that the belt-pulley d^4 is in line beneath an auxiliary correspondingly grooved or flanged belt-pulley b^6 , attached to the side of the loose pulley b^4 upon shaft B and with

which it is connected by a driving-belt b^7 , and the friction-wheel d^5 is in line beneath the fly-wheel b' .

The frame D is slightly overweighted at the outer end; but the friction-wheel d^5 is held, by the elastic contraction of belt b^7 , normally out of contact with the periphery of the fly-wheel b' ; but a foot-lever e is pivoted to the frame A, with a link e' at its rear end engaging the end of the shaft d^3 adjacent to the friction-wheel d^5 , and by pressure of the foot on the foot-rest at the forward end of the lever e the friction-wheel d^5 is lifted into contact with the periphery of fly-wheel b' , and the fly-wheel is thereby caused to rotate backward until the frictional contact of the friction-pulley is released.

The pivotal mounting of the sleeve D permits the oscillating movement of the shaft d^3 , by which the friction-wheel is brought into contact with the fly-wheel, as described, or receded therefrom by the elastic contraction of the belt b^7 , the former movement also elongating and thereby tightening the belt b^7 for its more efficient action upon its pulleys.

The arrangement of the reversing device in direct connection and combination with the belt-shifter shaft is a convenient feature of my invention, but is not absolutely essential.

In the machine illustrated I have shown also a brake-shaft f , extending in bearings at the side of the frame A, provided at the front with a foot-lever f' and at the rear with a brake-lever f^2 , carrying a brake-shoe f^3 , bearing against the fly-wheel. I also provide an additional crank-arm f^4 , linked to a corresponding crank-arm c^3 , attached to shaft c , whereby the brake-shaft f and its foot-lever f' are utilized as a means of shifting the belt b^5 to the loose pulley and by a slight excess of movement causing the brake-shoe f^3 to contact with the periphery of the fly-wheel b' . The foot-rests c^2 , e , and f' are arranged in immediate contiguity, so that the operator can reach either without change of position.

The general operation of my invention in connection with the belt-shifter shown is as follows: In adjusting the book upon the platen or "table" of the machine for the action of the rounding and backing devices and in adjusting the rounding-rollers and necessary pressure between jaws, also working over books when necessary to put them through the machine for the second time, it is necessary to manipulate the shifting-fork c' to give just enough forward motion to the machine to bring the parts into approximate operative position to test the adjustments. By shifting the belt to the loose pulley and operating the brake the parts can be held in this position. If adjustments require correction, these parts are to be separated by a reversal of the movement, which is done by depressing the foot-lever e , thus raising the friction-gear d^5 to contact with the fly-wheel b' , which reverses the motion of the fly-wheel and the operative parts of the machine.

These forward and back motions and the operation of the brake can be extended or limited as desired, and thus all motions of the machine required for adjustment of the work can be made with convenience by pressure of the foot without using the hands or releasing the work therefrom.

It will be understood that the arrangement of the shaft d^3 , as herein shown, pivotally supported on the belt-shifter shaft is a matter of convenience merely, and that this mechanical arrangement may be varied or others substituted. In many machines the belt-shifter is arranged overhead in proximity to the line-shaft pulley, and thus disconnected from the machine itself; but the reversing device of my invention is equally applicable to such machines; though in such case, would not be in so direct a combination with the belt-shifting devices as in the case illustrated in the drawings, the form illustrated being preferred in original constructions.

I claim as my invention and desire to secure by Letters Patent of the United States—

1. In a machine of the character described, the combination of fast and loose pulleys; a driving-shaft by which said pulleys are carried; a pivotally-mounted counter-shaft; operative connection between said loose pulley and counter-shaft; a foot-lever and connections for rocking the shaft about its pivotal connection; a friction-pulley on the counter-shaft; and a fly-wheel on the driving-shaft into contact with which the pulley is brought at will to reverse the motion of the machine.

2. In a machine of the character described the combination with a driving-shaft and fast and loose pulleys thereon; of a counter-shaft pivotally mounted between its ends and having a constantly-operating wheel; operative connections between the loose pulley and the counter-shaft; a wheel upon the driving-shaft; and a foot-lever and connections for rocking the counter-shaft and moving the constantly-operating wheel into contact with the wheel on the driving-shaft whereby the motion of the machine is reversed.

3. In a machine of the character indicated, the combination of the fast and loose pulleys; an intermediate driving-shaft carrying said pulleys; a fly-wheel on said shaft; a pivotally-mounted counter-shaft; a friction-roll at one extremity of the counter-shaft and arranged in line with the fly-wheel; a belt-pulley upon the other end of the counter-shaft; an auxiliary pulley secured to said loose pulley in line with said belt-pulley; a belt connecting said pulleys and a foot-lever for operating the pivotally-mounted counter-shaft so as to contact the friction-roll with the adjacent wheel of the machine, substantially as specified.

4. In a machine of the character indicated the combination of a belt-shifting device; a brake; and a reversing mechanism including a pivotally-mounted counter-shaft, a friction-roll thereon, means for constantly rotating

said shaft, and a foot-lever for rocking the counter-shaft about its pivotal connection.

5 5. In a machine of the character indicated, the combination of the belt-shifting device including a crank-shaft and operating foot-lever, said shaft having a lever provided with a brake member; and a mechanism for reversing the motion of the machine.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ARTHUR CRAWLEY.

Witnesses:

JOS. R. GARTNER,

CHAS. HERBERT JONES.