

(No Model.)

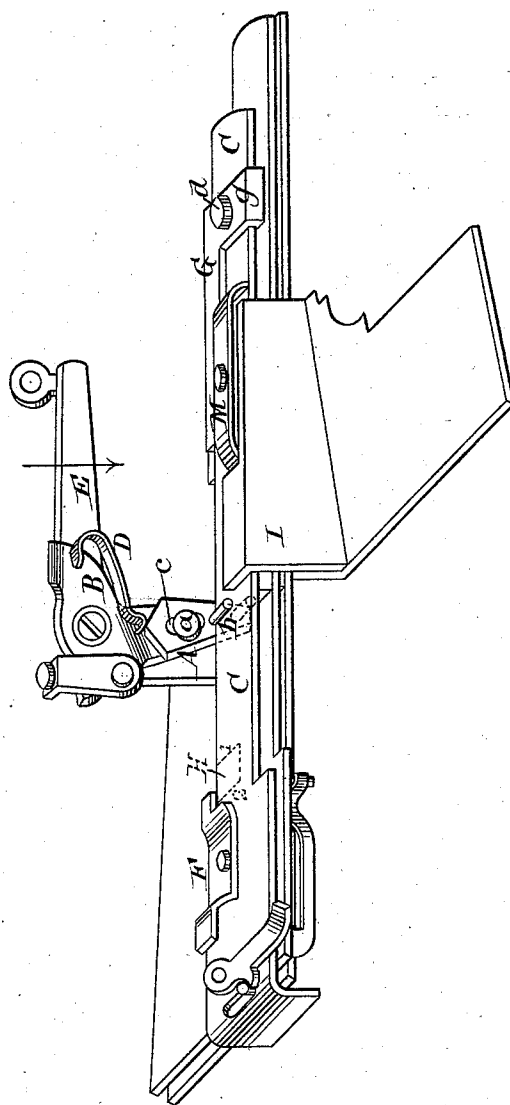
2 Sheets--Sheet 1.

L. ONDERDONK.
Automatic Reversible Clutch.

No. 231,843.

Patented Aug. 31, 1880.

Fig. 1.



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Fig. 2.

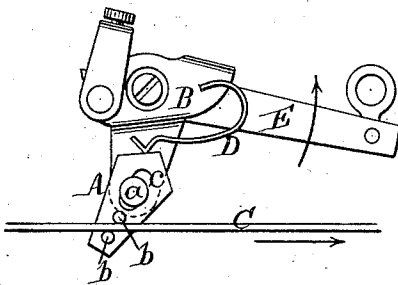


Fig. 3.

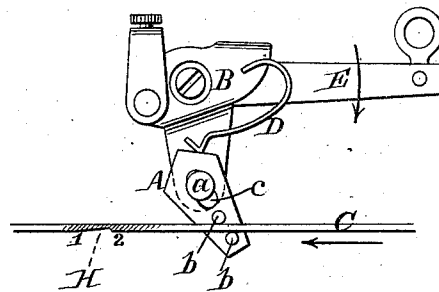


Fig. 4.

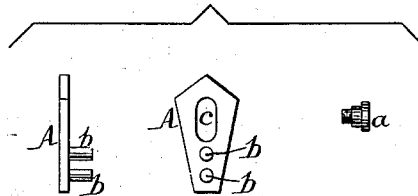


Fig. 5.

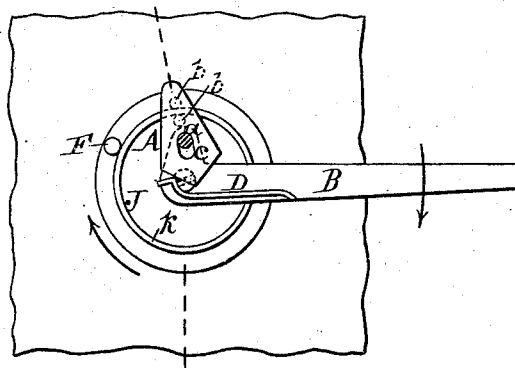
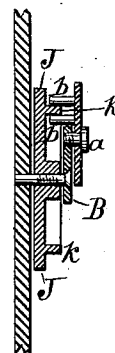


Fig. 6.



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UNITED STATES PATENT OFFICE.

LANSING ONDERDONK, OF ADAMS' STATION, ASSIGNOR OF ONE-HALF OF HIS RIGHT TO CAMPBELL C. BROUN, OF BROOKLYN; SAID BROUN ASSIGNOR OF FIFTEEN ONE-HUNDREDTHS OF HIS RIGHT TO HENRY P. WELLS, OF BROOKLYN, N. Y.

AUTOMATIC REVERSIBLE CLUTCH.

SPECIFICATION forming part of Letters Patent No. 231,843, dated August 31, 1880.

Application filed April 8, 1880. (No model.)

To all whom it may concern:

Be it known that I, LANSING ONDERDONK, of Adams' Station, in the county of Albany and State of New York, have invented a new and useful Improvement in Automatic Reversible Clutches, of which the following is a specification, reference being had to the accompanying drawings.

My invention is an improvement in mechanical movements.

It consists of an automatic reversible friction-clutch used in connection with a lever for gradually moving a slide or bar first in one direction, then in the opposite direction, the change being made automatically and in such a way that the distance to be traveled by the slide or bar may be varied at will.

My device is also applicable to a wheel, so that from the oscillation of the lever the wheel may be made to revolve first in one direction and then in the other, the change in direction being made automatically and in such a way that the distance traveled by the wheel may be varied at will.

Figure 1 represents my device as applied to a plaiting attachment for sewing-machines wherein it is to cause the upper slide, C, to move alternately to and fro, traveling over a distance variable at will. Fig. 2 is a detached view of my friction-clutch A combined with a lever acting on a slide or bar. The friction-clutch A is in the position it assumes when feeding the slide or bar in the direction of the arrow. Fig. 3 is a like view, showing the position of the clutch A when moving the slide or bar in the opposite direction—i. e., that indicated by the arrow. Fig. 4 represents plan and side views of the friction-clutch A, and also a view of the pivot *a*, on which the clutch oscillates. Fig. 5 represents my friction-clutch A combined with a lever and as applied to a wheel. Fig. 6 is a sectional view, on the dotted line, of the combination shown in Fig. 5.

I now proceed to describe my invention in detail.

A represents a friction-clutch substantially of the form shown in Fig. 4. It is provided with two pins, *b b*, fixed firmly near its nar-

rower end, and set in the position shown and at a distance apart a little greater than the thickness of the bar, slide, or other part upon which the clutch is intended to act. A slot, *c*, is also made on the median line of the friction-clutch A, and near its larger end. The upper edge of the clutch A is formed by a double incline having its apex on said median line. Through this slot is passed the pin *a*, provided with a head larger than the slot, a shoulder fitting the slot, and an extension, which may be passed through a hole in the lever B and riveted thereto. Thus the friction-clutch is secured to the lever B, and may oscillate on the pin *a*.

Attached to the lever B is a spring, D. The free end of this spring bears upon one side or the other of the double incline, forming the upper edge of the friction-clutch A. Motion may be imparted directly to the lever B, as shown in Figs. 5 and 6, or by another lever, E, as shown in Figs. 1, 2, and 3, or in any other manner.

The slide or bar C is of such a thickness as just to pass freely between the pins *b b* of the friction-clutch A. Upon the slide or bar C, and near one of its extremities, is swiveled the fixed stop F, so that either end or its side may be presented toward the friction-clutch A at will. Its form is immaterial so long as it serves the purpose hereinafter set forth. That shown answers very well.

Upon the other extremity of the slide or bar C is placed the movable stop G. It consists of a tongue of metal projecting toward the friction-clutch A, attached to a clasp, *g*. This clasp embraces the slide or bar C, and may be set at any point thereon by the thumb-screw *d*.

If the motion of the slide or bar C in one direction is always to cease at a certain point, it is better to place the fixed stop at that and the adjustable stop at the other end. In some cases in which my invention may be of use it may be advisable to have both stops fixed or both stops movable to suit the particular mechanism with which it is combined and the result sought, or a change of form may be required. I do not confine myself to the form

described and shown. Anything which fills the conditions hereinafter set forth will answer.

When the motion of the slide or bar C in one or both directions must cease at a given point it is advisable to introduce the safety-notch H, (shown in dotted lines in Fig. 1, and more clearly to be seen and understood in and from Fig. 3.) This notch, it will be observed, is formed by a gradual slope, 1, on one side and a shoulder, 2, on the other. The shoulder must form that side of the safety-notch which is nearer the friction-clutch A—as, for example, in the device shown in Fig. 1 it is clear that when the shoulder of the slide C comes in contact with the bed-piece I any further motion in that direction must result in accident. In this case, therefore, the shoulder would form the side of the notch marked 1, and the gradual slope the side marked 2.

When my device is applied to a wheel, J, (see Figs. 5 and 6,) a chine, *k*, is formed upon one of the sides of the wheel, and the distance between the pins *b b* in the friction-clutch A is proportioned to the thickness of the chine just as when my device is applied to a bar or slide. The actuating-lever may be pivoted on the same axis as the wheel.

The arrangement of the spring D and of the friction-clutch A and its parts is substantially the same as before described.

The fixed stop may consist of a pin or button, F, riveted to the wheel, and an adjustable stop to be clamped thereon at any desired point; or, if a complete revolution only is requisite, as in the case shown in Fig. 5, but one stop may be used. If the range of movement desired exceeds one revolution of the wheel the stops may be placed on the part actuated by the wheel or elsewhere, and any form or shape which the mechanism to which the device is applied admits of will answer, provided it is so arranged that when the wheel has finished its movement in one direction the friction-clutch A shall strike the stop near the extremity, where the pins *b b* are located.

Having thus described my device, I will now proceed to its method of operation.

As applied to a slide or bar, when the parts are in proper position, as shown in Figs. 1, 2, and 3, the slide or bar passes between the pins *b b* of the friction-clutch A. The interval between those pins is such as to allow the slides to pass freely when the friction-clutch is nearly perpendicular; but where the friction-clutch is inclined to any extent, as shown in Figs. 2 and 3, then the pins gripe the slide firmly, and if the clutch continues its movement the slide must then move with it. The clutch A oscillates freely on a pivot, *a*. The position of the spring D as it bears upon one or the other side of the double incline forming the upper edge of the clutch A determines the direction in which the slide or bar will be moved. Suppose the position of the spring D to be that shown in Fig. 2. As the lever B rises the spring D tends to in-

crease the inclination of the friction-clutch A and jam the slide or bar between the pins *b b*, and the more resistance the bar offers the more the clutch tends to incline and the tighter it bites the slide. The lever B continues to move, and the friction-clutch A partakes of its movement and drags the slide with it in the direction of the arrow. The lever B, having completed its ascent, begins to descend. The spring D, since it still bears on the same side of the incline, prevents the pins *b b* of the clutch from gripping the slide. Thus they slide along over the slide, which remains at rest, until the movement of the lever is reversed. Then the spring D forces the clutch to take a fresh hold and again moves the slide, as before. This will continue until the lower part of the friction-clutch A or one of the pins *b* comes in contact with some obstacle which arrests its motion, while the lever B continues to move. This trips the friction-clutch. The spring D rides over the apex of the double incline, and thereafter bears on the surface of the double incline, as shown in Fig. 3. The slide is then moved on the down instead of the up stroke of the lever, and in the reverse direction—that shown by arrow—and this continues until the friction-clutch A is again tripped by coming in contact with another obstacle, as previously described.

The safety-notch H, Figs. 1 and 3, operates as follows: On the long slope 1 of the notch the slide is too thin for the pins on the clutch to jam upon it; but the moment the clutch is reversed the pins thereof bite beyond the notch, where the slide or bar is of uniform thickness, and jam upon and move the slide. The shoulder of the notch 2, Fig. 3, must therefore be so located that when the lower pin *b* of the clutch A bears against it, and the clutch has completed its oscillation in that direction, the slide will be exactly at the desired point. Then until the clutch is reversed the pins *b b* thereof will continue to pass back and forth over the longer slope of the notch, while the slide remains stationary.

Another advantage derived from the use of the safety-notch is that, should it be desired to stop the motion of the slide without arresting the movement of the lever it may be done by simply setting the fixed stop F so that the clutch A cannot strike it. The clutch cannot then reverse, and its pins will move back and forth in the safety-notch, while the slide remains at rest.

If a very short motion of the slide is desired, one end of the fixed stop F may be widened out, so as to strike the heel of the lever B, which actuates the clutch A. Then if, when the slide begins to move so that the fixed stop F approaches the clutch A, the fixed stop is turned so the widened end is presented to the clutch, the lever itself, by striking against the fixed stop, will force the slide in one direction, while the clutch will pull it in the other, a change of direction taking place with each rise and each

fall of the lever. The slide or bar must offer some slight resistance, so that it may not be disturbed when the pins *b b* of the clutch A draw back for a fresh hold. Generally the friction of the mechanism itself will be enough; but if not, then a tension-spring controlled by a thumb-screw, as shown at M, Fig. 1, or some other similar arrangement, must be employed.

From the foregoing the mode of operation of my device when applied to a wheel will be clear.

Having thus described my invention and its mode of operation, what I claim as new, and desire to patent, is—

1. In combination with an oscillating lever and a spring, a friction-clutch provided with clamping-pins near its lower extremity, and having its upper edge terminating in a double incline, substantially as shown and described.

2. In combination with an oscillating lever and a spring, a friction-clutch provided with clamping-pins near its lower extremity, and having its upper edge terminating in a double incline, combined with a slide or bar, substantially as described and shown.

3. In combination with an oscillating lever and a spring, a friction-clutch provided with clamping-pins near its lower extremity, and having its upper edge terminating in a double incline, combined with a wheel, substantially as described and shown.

4. In combination with an oscillating lever

and a spring, a friction-clutch provided with clamping-pins near its lower extremity, and having its upper edge terminating in a double incline, combined with a slide or bar provided with a safety notch or notches, substantially as shown and described.

5. In combination with an oscillating lever and a spring, a friction-clutch provided with clamping-pins near its lower extremity, and having its upper edge terminating in a double incline, combined with a slide or bar and a stop or stops, substantially as shown and described.

6. In combination with an oscillating lever and a spring, a friction-clutch provided with clamping-pins near its lower extremity, and having its upper edge terminating in a double incline, combined with a wheel and a stop or stops, substantially as described.

7. In combination with an oscillating lever, a spring, a friction-clutch, and a slide or bar, the fixed stop swiveled near its center to said bar, substantially as shown and described.

In testimony that I claim the foregoing improvement in mechanical movements, as above described, I have hereunto set my hand this 24th day of March, 1880.

LANSING ONDERDONK.

Witnesses:

HENRY P. WELLS,
JNO. BAKER.