No. 850,164. PATENTED APR. 16, 1907.

W. H. KLOCKE.

CLUTCH.

APPLICATION FILED MAY 26, 1905.

2 SHEETS—SHEET 1.

Fig. 1

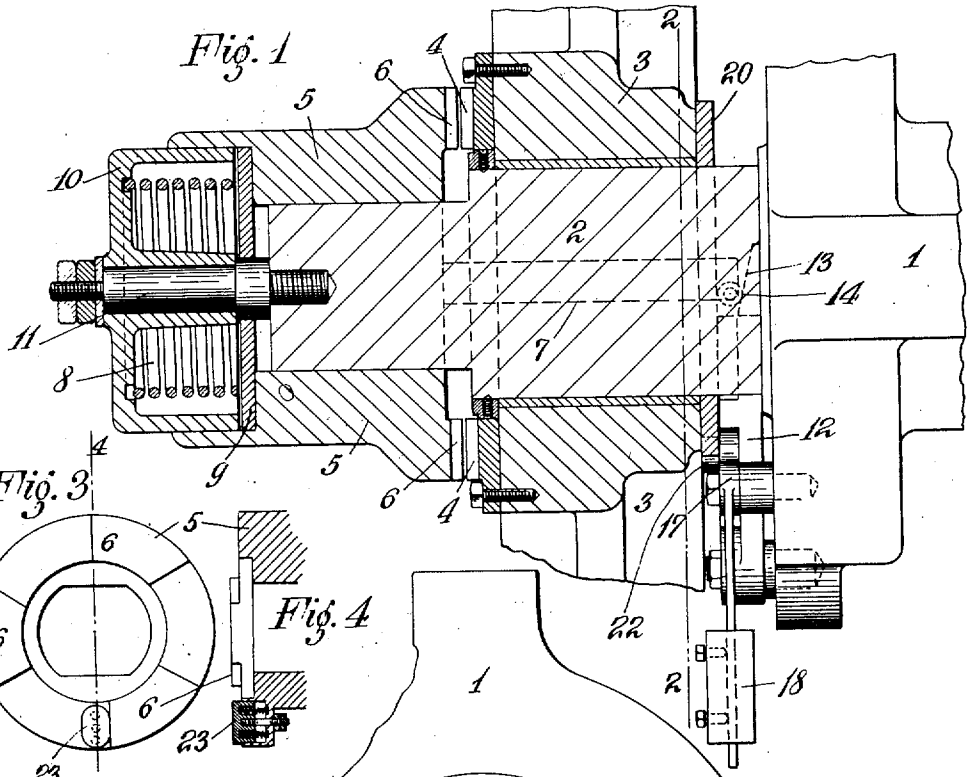
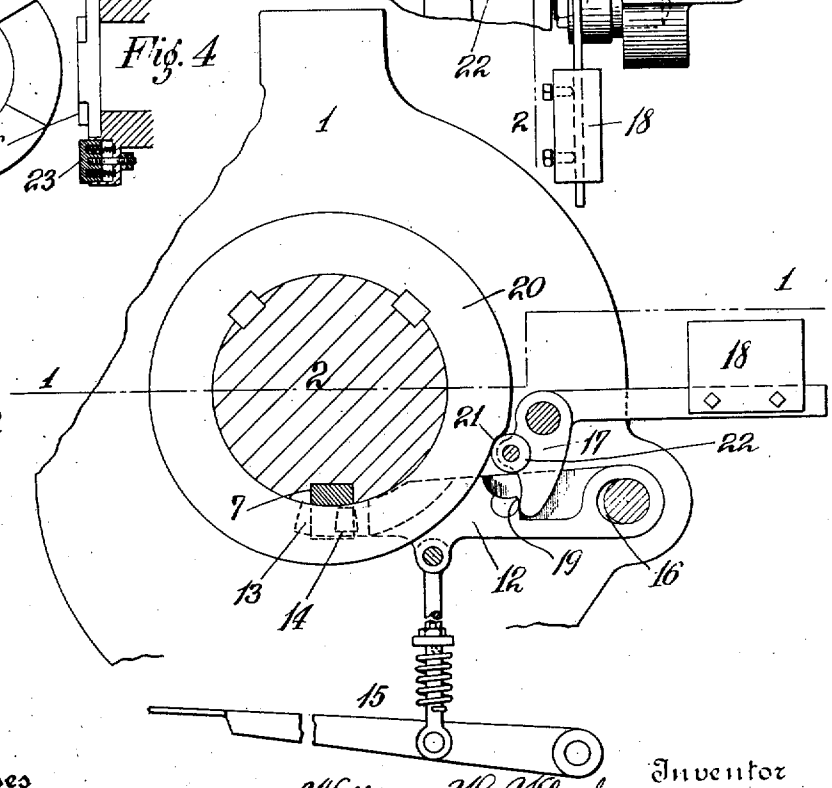


Fig. 3

Fig. 4

Fig. 2



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2 SHEETS—SHEET 2.

Fig. 5

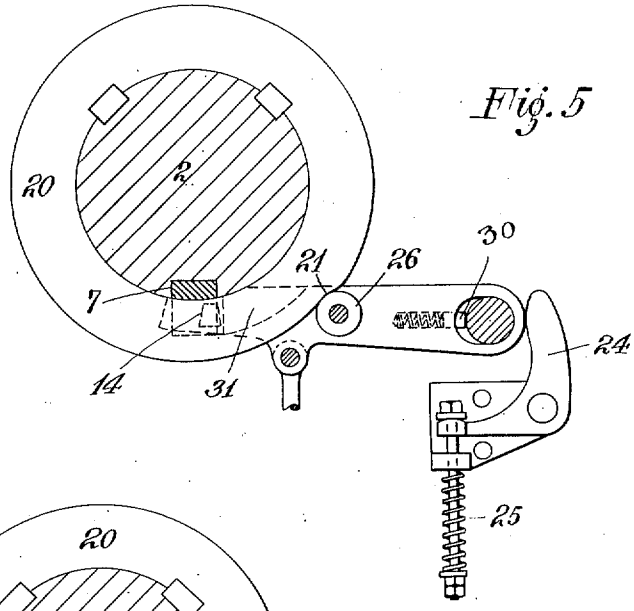
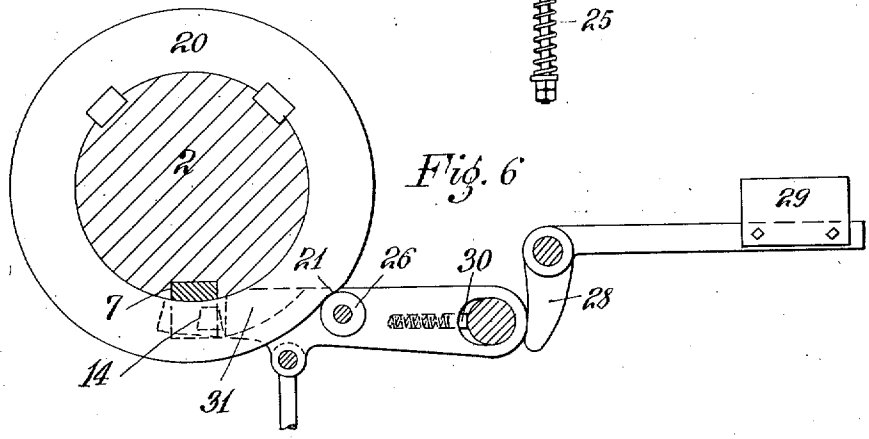


Fig. 6



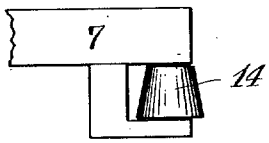


Fig. 9

Fig. 7

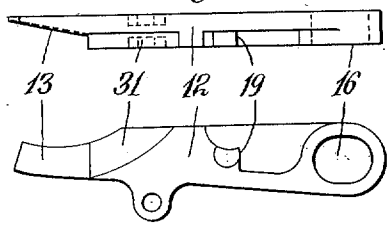


Fig. 8

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UNITED STATES PATENT OFFICE.

WILLIAM H. KLOCKE, OF NEW YORK, N. Y., ASSIGNOR TO E. W. BLISS COMPANY, A CORPORATION OF WEST VIRGINIA.

CLUTCH.

No. 850,164. Specification of Letters Patent. Patented April 16, 1907.

Application filed May 26, 1905. Serial No. 262,323.

To all whom it may concern:

Be it known that I, WILLIAM H. KLOCKE, a citizen of the United States of America, and a resident of the borough of Brooklyn, city of New York, county of Kings, and State of New York, have invented certain new and useful Improvements in Clutches, of which the following is a specification.

The present invention relates generally to clutches, and has for its main object the production of effective and simple means for insuring the complete disengagement of the clutch members, thereby preventing the clicking of the clutch-teeth occasioned by frictional contact of the parts after their disengagement, and thereby also preventing undue wear of the parts.

In the prior art it has been customary to have a latch-moving mechanism operated by a weight or spring to impart the final motion to entirely free the two members from each other. It has further been customary to restore the latch-moving mechanism by the same means that withdraws the latch—that is, generally by means of a foot-treadle. As the weight necessary to throw the parts entirely out is considerable it will be understood that it requires considerable pressure to restore the weight, so much so that it is only with difficulty that the operator can bring sufficient pressure to bear upon the treadle to effect the proper movement of the parts.

In the present invention this objectionable feature is avoided by controlling the latch-moving mechanism independently of the means for withdrawing the latch so that the power of the operator is not required to restore the parts to their proper position, as was formerly the case.

The means preferred to carry out this improvement contemplate the utilization of the power of the machine to lift this weight or restore it to its operating position, and in the particular form disclosed the driven clutch member is made to do the work.

Other features of construction and combinations of parts will appear as the specification proceeds.

In the accompanying drawings, the invention has been embodied in a suitable form, showing also modifications of the same; but changes may of course be made beyond those indicated in the said modifications without departing from the invention.

In the said drawings, Figure 1 indicates a horizontal sectional view on the line 1 1 of Fig. 2. Fig. 2 is a vertical sectional view on the line 2 2 of Fig. 1. Fig. 3 is a detail view of the means for preventing the clutch members from falling one ahead of the other. Fig. 4 is a sectional view on the line 4 4 of Fig. 3. Figs. 5 and 6 show two modifications. Figs. 7 and 8 are detail views of the latch. Fig. 9 is a detail view of the key for pushing the clutch members out of engagement.

Similar numerals of reference indicate corresponding parts in the different views.

1 indicates a framework of the machine to be operated and through which extends the main shaft 2. Mounted loosely on this main shaft is the driving member 3, provided with the clutch-teeth 4, on that side which is opposite to the framework. At its outer end the shaft 2 supports the driven member 5, slidably mounted on the same. This driven member is provided with clutch-teeth 6 adjacent to the teeth 4. A key 7 extends through the shaft from a point between the framework and the driving member and abuts against the clutch-surface of the driven member. This key rotates with the driven member and is further capable of a lengthwise movement. Suitable means are provided for normally holding the two members in engagement, taking the form in the present instance of a spring 8, bearing against the ring 9, which abuts the driven member, thereby forcing the two members together. This spring is held in position by means of a cap 10, fastened to the end of the shaft by means of the screw 11.

Interposed between the framework and the driving member is a latch 12 in the form of a pivoted lever, provided with a tapered portion 13. The key is provided with a friction-roll 14, which when the members are in engagement extends into the plane of the latch, so that when the rotation of the shaft brings the key around to the latch the friction-roll will travel over the tapered portion and cause the key to move lengthwise, thereby opposing the action of the spring and causing the disengagement of the members. When the members have become thus disengaged, the rotation of the key ceases. It

frequently occurs, however, that the members still have a frictional contact to some extent, whereby the parts gradually wear down and become ineffective, besides producing an undesirable clicking sound. In order to obviate this, there is provided a latch-moving mechanism which acts to move the latch so as to cause the key to entirely free the members from each other. In the present instance the latch, which is capable of being withdrawn by swinging around its pivot when the treadle 15 is depressed, is mounted on the said pivot, so as to be capable of a movement transverse to its pivotal axis. This is readily accomplished by elongating the hole 16 of the latch. The latch-moving mechanism, which acts to move the latch in the present instance, takes the form of a pivoted dog 17, which normally has a tendency, by reason of the weight 18, to push the latch into the position shown in Fig. 2 by engaging with the heel 19. In order to relieve the operator from raising this weight, it is controlled by means independent of the means for withdrawing the treadle, it being preferably released and restored by means of the driven member. In the particular form followed there is a cam 20, mounted on the shaft, which rotates with the driven member, the said cam being provided with an abrupt drop or short lap 21, which comes opposite the friction-roll 22 of the dog 17 substantially at the moment of disengagement of the members of the clutch. By this means the tapered portion 13 wedges the key still farther in and causes the complete disengagement of the members. When the latch is withdrawn, the spring will cause the members to engage again, thereby rotating the shaft carrying the cam, which rotation will lift the weight connected to the dog 17 up, so as to be ready to drop when the abrupt lap 21 comes around into position to act again.

The tapered portion 13 of the latch is preferably also beveled downwardly, and the friction-roll carried by the key is truncated cone shaped, whereby the said roll will be kept in proper engagement with the said portion 13, even though the latch by accident should not have assumed its uppermost position when released.

In order to prevent the two members of the clutch to fall one ahead of the other when rotating together, there is provided a spring-seated spacing member 23 adjacent to one of the teeth of one of the clutch members, as shown in Figs. 3 and 4. This construction also facilitates the engagement of the driving and driven members with each other, as the spring-seated member will recede when a tooth on the opposed clutch-surface strikes it and will tend to guide the two clutch-surfaces into proper engagement.

In Fig. 5 is shown a modification in which the latch-dog 24 is actuated by means of a spring 25, while the roller 26, which releases and restores the dog by its coöperation with the cam 27, is mounted directly on the latch. In Fig. 6 the roller 26 is also mounted on the latch; but the dog 28 is operated by a weight 29 instead of by means of a spring. In both Figs. 5 and 6 a spring-seated pin 30 normally tends to assist the latch-moving dog.

In all three constructions shown the latch will preferably be provided with a cut-out portion 31, which forms a continuation of the tapered portion 13, so that if the speed of the machine should be too high the friction-roll carried by the key will not encounter any stop whereby the parts might be broken.

What is claimed is—

1. The combination of a driving and a driven member having opposed clutch-surfaces, a key rotating with the driven member and movable lengthwise thereof for disengaging the said members, a friction-roll carried by the said key, a latch having a tapered portion for engaging with the roll carried by the key so as to cause the latter to disengage the members, means for normally holding the members in engagement and for causing the key to extend into the plane of the latch, means for withdrawing the latch so as to allow the members to become engaged, and a latch-moving mechanism for imparting a movement to the latch to cause the key to entirely free the members from each other, controlled independently of the means for withdrawing the latch.

2. The combination of a driving and a driven member having opposed clutch-surfaces, a key rotating with the driven member and movable lengthwise thereof for disengaging the said members, a truncated cone-shaped friction-roll carried by the said key, a latch having a tapered and downwardly-beveled portion for acting upon the key to cause the latter to disengage the members, means for normally holding the members in engagement and for causing the key to extend into the plane of the latch means for withdrawing the latch so as to allow the members to become engaged, and a latch-moving mechanism for imparting a movement to the latch to cause the key to entirely free the members from each other controlled independently of the means for withdrawing the latch.

3. The combination of a driving and a driven member having opposed clutch-surfaces, a key rotating with the driven member and movable lengthwise thereof for disengaging the said members, a friction-roll carried by the said key, a latch having a tapered portion for acting upon the key to cause the latter to disengage the members, means for normally holding the members in engagement and for causing the key to extend into the plane of the latch, means for withdrawing the latch so as to allow the members to be-

come engaged, a latch-moving mechanism for imparting a movement to the latch to cause the key to entirely free the members from each other, and means movable with the driven member controlling the said latch.

4. The combination of a driving and a driven member having opposed clutched surfaces, a key rotating with the driven member and movable lengthwise thereof for disengaging the said members, a truncated cone-shaped friction-roll carried by the said key, a latch having a tapered and downwardly-beveled portion for acting upon the key to cause the latter to disengage the members, means for normally holding the members in engagement and for causing the key to extend into the plane of the latch, means for withdrawing the latch so as to allow the members to become engaged, a latch-moving mechanism for imparting a movement to the latch to cause the key to entirely free the members from each other, and means moving with the driven member controlling the said latch-moving mechanism.

5. The combination of a driving and a driven member having opposed clutch-surfaces, a key rotating with the driven member and movable lengthwise thereof for disengaging the said members, a friction-roll carried by the said key, a latch having a tapered portion for acting upon the key to cause the latter to disengage the members, means for normally holding the members in engagement and for causing the key to extend into the plane of the latch so as to allow the members to become engaged, a latch mechanism for imparting a movement to the latch to cause the key to entirely free the members from each other, and a cam moving with the driven member for releasing and restoring the said latch-moving mechanism.

6. The combination of a driving and a driven member having opposed clutched surfaces, a key rotating with the driven member and movable lengthwise thereof, a latch for acting upon the key to cause the latter to disengage the members, a truncated cone-shaped friction-roll carried by the said key, a latch having a tapered and downwardly-beveled portion for acting upon the key to cause the latter to disengage the members, means for normally holding the members in engagement and for causing the key to extend into the plane of the latch, means for withdrawing the latch so as to allow the members to become engaged, a latch-moving mechanism for imparting a movement to the latch to cause the key to entirely free the members from each other, and a cam moving with the driven member for releasing and restoring the said latch-moving mechanism.

7. The combination of a driving and a driven member having opposed clutch-surfaces, a key rotating with the driven member and movable lengthwise thereof for disengaging the said members, a pivoted latch free to move transversely on its pivotal axis for acting upon the key to cause the latter to disengage the members, means for normally holding the members in engagement and for causing the key to extend into the plane of the latch, means for withdrawing the latch so as to allow the members to become engaged, a pivoted dog adapted to move said latch transversely to its pivotal axis to effect the complete disengagement of the members, and means for releasing and restoring said pivoted dog by the rotation of the driven member.

8. In a clutch, the combination of two clutch members, opposed teeth in said clutch members adapted to engage with each other, and a spring-seated spacing member adjacent to one of said teeth for facilitating the engagement of the members and for preventing them from falling one ahead of the other as they rotate.

Signed at Brooklyn, New York, this 11th day of May, 1905.

WILLIAM H. KLOCKE.

Witnesses:
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BENJAMIN CITRIN.