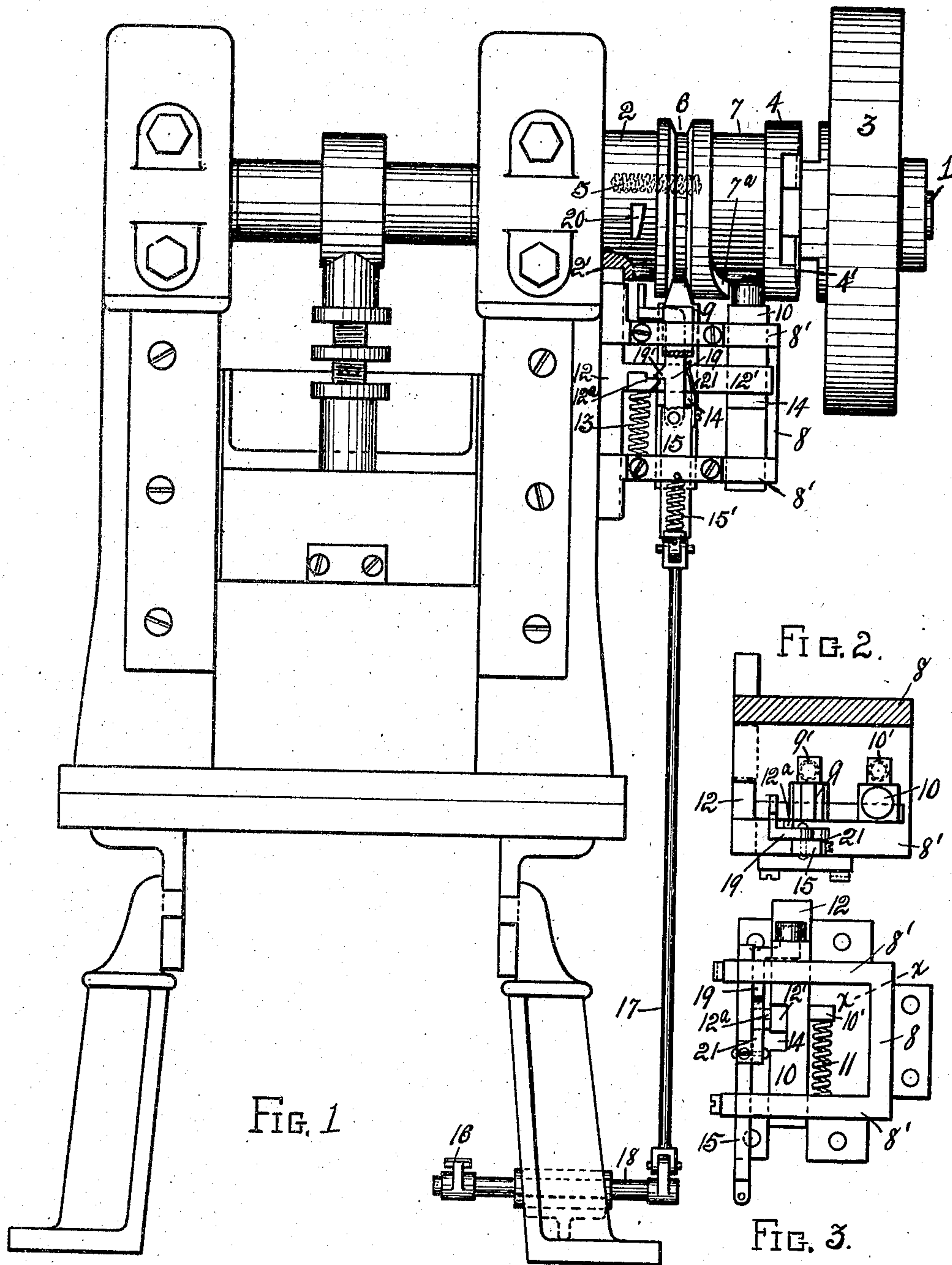


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CLUTCH.

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CLUTCH.

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To all whom it may concern:

Be it known that I, LEONHARD BAUROTH, a citizen of the United States, and a resident of Toledo, in the county of Lucas and State of Ohio, have invented a certain new and useful Clutch; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to the class of clutches employed on power-presses or other machines in which it is desired to intermittently impart a single revolution to a shaft from a continuously-revolving element at the will of the operator.

The object of my invention is the provision of a simple, efficient and improved clutch of this character, which is adapted to have a positive and automatic release at each revolution of the shaft, thus rendering a second revolution thereof impossible without the operator first releasing the treadle and again depressing it for such purpose, and which obviates the noise and clatter heretofore incident to the operation of clutches of this class.

The operation, construction and arrangement of the parts of the invention are fully described in the following specification and illustrated in the accompanying drawings, in which,—

Figure 1 is a front elevation of a power-press embodying my improved clutch, with a portion of the clutch mechanism broken away and the clutch collar in released position. Fig. 2 is a top plan view of the clutch parts disposed below the revolving parts with the bracket carrying them in section, as along a line *xx* in Fig. 3, and Fig. 3 is an outer end view of said clutch parts and bracket.

Referring to the drawings, 1 designates the shaft with which the clutch is associated, 2 a collar, which is keyed to the shaft, 3 a pulley or other continuously revolving element, which is loose on the shaft, and 4 the clutch-collar, which is feathered on the shaft intermediate the collar 2 and pulley 3 to adapt it to be moved into or out of engagement with the clutch portion of the pulley-hub. The clutch-collar 4 is influenced by coiled compression-springs 5, interposed between it and the collar 2, to normally engage with the pulley-hub, and is formed circumferentially with

the V- or taper-walled groove 6 and the cam groove 7 for the purpose hereinafter described.

Supported beneath the collars 2 and 4, as by the press frame, is a bracket 8, which is shown as being formed with the two vertically spaced ledges or shelves 8', but may be of any other suitable construction. Working through vertically registering openings in the two shelves 8' of the bracket are the two plungers 9 and 10, the former having its upper end preferably wedge-shaped to adapt it to fit into the groove 6 of the clutch-collar 4, and the latter having its upper end preferably rounded to adapt it to work in the cam-groove 7 of said collar. These plungers are each influenced to enter their respective grooves by the action thereon of the coiled compression-springs 11, 11, which have their opposite end thrusts against the top of the lower shelf 8' of the bracket 8 and the lugs 9' and 10' projecting from the sides of the respective plungers. A lock-bar 12 is also carried by the bracket 8 for vertical movement beneath the collar 2, and is yieldingly acted on by a spring 13 to cause its upper end to normally engage with a socket 2' in said collar when such socket is moved into register therewith, whereby to lock said collar and its shaft against rotation. The lock-bar 12 has an arm 12' projecting horizontally therefrom through incuts or recesses 14 provided in one side of each of the plungers 9, 10 to adapt a lowering of the lock-bar to lower said plungers out of engagement with the grooves 6, 7 in the clutch-collar and against the tension of their springs. As it is necessary for the lock-bar 12 to move to release the collar 2 before the plungers 9, 10 are released from the clutch-collar to permit its engagement with the pulley-hub, the incuts 14 in the sides of the plungers are made of sufficient depth to prevent an engagement of the arm 12' on its lowering movement with the lower wall of the incuts until the bar 12 has moved free from its notch in the collar, thus preventing an engagement of the clutch before the lock-bar is released from the collar 2.

15 designates a bar which is guided in a suitable manner by the bracket 8 for vertical reciprocatory movements and has its lower end connected to a foot-treadle 16 or other controlling-member, as by a rod 17 and rock-shaft 18. To one side of the bar 15 is pivoted the lower end of a trip-finger 19, which is

formed with a catch-lug 19' for engagement with a catch-lug 12^a on the side of the lock-bar arm 12' whereby a lowering of the trip-finger will effect a lowering of the lock-bar.

5 The trip-finger 19 has its upper end projected in contiguous position to the collar 2 and offset, as shown, to adapt it to be engaged by a cam-block or projection 20 on said collar and moved thereby on its pivot to effect

10 an automatic release of its catch-lug from that of the arm 12' at a predetermined point in a revolution of the collar 2, thus permitting a return of the lock-bar 12 to position to again work into the collar notch 2' when

15 the collar has completed a single revolution. The finger 19 after being tripped is returned to normal position by the influence thereon of a spring 21, while the bar 15 and treadle when released are returned to normal elevated position by a spring 15', or in any

20 other suitable manner.

As the rotation of the collars 2, 4 and shaft 1 stops instantly upon the release of the clutch-collar from the pulley it is necessary

25 to provide other means than the cam-groove to throw the end of the clutch-collar free from contact with the end of the pulley-hub in order to obviate the objectionable knocking of the clutch surfaces and consequent

30 noise as one rotates past the other. I accomplish this by circularly beveling the ends of the clutch projections or teeth of the clutch-collar, as shown at 4', to enable the continued rotation of the pulley to force the

35 clutch-collar back a distance equal to the depth of such bevel, due to the ends of the clutch projections of the pulley-hub working thereagainst. As the clutch-collar is thus moved free from engagement with the pul-

40 ley-hub the wedge end of the plunger 9 moves into engagement with the V-groove 6 of the clutch-collar, thus holding said collar completely retracted relative to the pulley-hub until the treadle is again depressed to

45 draw the plungers 9, 10 and lock-bar 12 from engagement with their respective collars. As the plunger 9 always engages with the groove 6 at the same point therein it is apparent that it is not necessary to extend the

50 groove entirely around the clutch-collar as shown but merely to provide a notch or socket in proper position on the clutch-collar for such purpose.

The operation of my invention is as follows:—The operator, wishing to impart a

55 revolution to the shaft 1, depresses the foot-treadle 16, thus lowering the bar 15 and attached trip-finger 19 and effecting a consequent lowering of the lock-bar 12, from locking engagement with the collar 2. The lock-

60 bar 12 on lowering has a slight initial movement relative to the plungers 9, 10, due to its arm 12' working in the incuts 14 in said plungers, and then acts on said plungers to

65 lower them out of engagement with their

respective grooves in the clutch-collar 4, thus effecting a release of the lock-bar from its collar before the plungers have been released from the clutch-collar so that the shaft is

70 free to turn with the pulley as soon as the clutch-collar moves into engagement with the latter. When the collars 2, 4 have turned a short distance the trip-finger 19 is engaged and moved by the cam-block or pro-

75 jection 20, carried by the collar 2, to effect a release of the catch-lug 19' of said finger from depressing engagement with the catch-

80 lug 12^a of the lock-bar 12, thus permitting the lock-bar, actuated by its spring 13, to rise until stopped by contact of its end with the periphery of the collar 2, and also per-

85 mitting the plunger 10 to move into engagement with the broadened portion of the cam-groove 7 of the clutch-collar. As the collars 2, 4 near the completion of a single revolution

90 the cam surface 7^a of the cam-groove 7 contacts with the plunger 10 to effect an inward movement of the clutch-collar to release the pulley on the completion of the revolution of

95 the shaft. At the end of the revolution the rotation of the collars 2, 4 and shaft 1 is positively stopped by the upper end of the lock-

100 bar 12 moving into engagement with the socket 2' in the collar 2. On a continued rotation of the pulley 3 relative to the clutch-

105 collar the clutch projections of the pulley cooperate with the beveled ends of the clutch projections of the collar to effect a further retraction of the clutch-collar so as to per-

110 mit the wedge end of the plunger 9 to work into the groove or recess 6 to maintain the collar in such position until again released by a depression of the treadle.

I wish it understood that I do not desire to be restricted to the exact details of construction and arrangement of the parts of the invention shown and described, as obvious

115 modifications will occur to persons skilled in the art.

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

110

1. In combination, a shaft, a clutch-pulley loose thereon, a spring-actuated clutch-collar feathered to the shaft and having a peripheral cam groove, a yieldingly mounted plunger adapted to normally cooperate with the cam-groove to move the clutch-collar to released position at a predetermined point in a

115 revolution of the shaft, movable means for locking the shaft against rotation and having a part for coacting with said plunger to move it out of engagement with said groove when

120 said locking means is moved to release the shaft, means influencing a locking movement of said locking means, a trip-member manually movable to effect a releasing movement

125 of said first means, and a part carried by the shaft and adapted to move said trip-member at a predetermined point in a revolution of

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the shaft to release said locking means to permit its return to locking position and the plunger to move to engage said cam-groove, substantially as described.

2. In combination, a shaft, a clutch-pulley loose on the shaft, a spring actuated clutch-collar feathered to the shaft and having a cam-groove, a plunger normally actuated to engage the cam-groove to force the clutch-collar out of engagement with the pulley at the end of each revolution of the shaft, a lock-bar influenced to normally lock the shaft against rotation and movable to release the shaft and move said plunger out of engagement with its groove, a manually movable member, a trip-finger pivoted to said member and movable therewith to effect a releasing movement of the lock-bar to permit an engagement of the clutch, and means for moving the trip-finger on its pivot at a predetermined point in a revolution of the shaft to effect a release of the lock-bar to permit it and the plunger to return to normal positions.

3. In combination, a shaft, a drive member loose on said shaft, a clutch-collar feathered to the shaft and normally influenced to engage the drive-member, said clutch-collar having a peripheral cam-groove and the ends of its clutch projections beveled, a movable part influenced to normally coact with said groove to move the clutch-collar to released position, a yieldingly movable element adapted to normally cooperate with the clutch-collar to hold it in a position to which it is moved by the coaction of the drive-member with the beveled ends of its clutch projections, and mechanism for moving said part and element out of engagement with the clutch-collar and automatically releasing them prior to a complete revolution of the collar to permit their reengagement with the collar, substantially as described.

4. In combination, a shaft, a drive member loose on said shaft, a clutch-collar feathered to the shaft and normally influenced to engage the drive-member, said clutch-collar having a peripheral cam-groove and the ends of its clutch projections beveled, a movable part influenced to normally coact with said groove to move the clutch-collar to released position, a yieldingly movable element adapted to normally cooperate with the clutch-collar to hold it in a position to which it is moved by the coaction of the drive-member with the beveled ends of its clutch projections, manually controlled mechanism for moving said part and element to release the clutch-collar, and means adapted to cooperate with said mechanism to release said part

and element at a predetermined point in a revolution of the shaft.

5. In combination, a shaft, a drive-member loose thereon, a clutch-collar feathered to the shaft and normally influenced to engage the drive-member, said collar having the ends of its projecting clutch portions circularly beveled and its periphery provided with a cam-groove and with a recess having tapered walls, a plunger normally influenced to engage the cam-groove whereby to force the clutch-collar to released position at a predetermined point in a revolution thereof, a plunger normally influenced to engage said recess and to hold the clutch collar in a position to which it is forced by the drive member working against its beveled end, mechanism movable to draw the two plungers out of engagement with the collar, and means acting on said mechanism to release said plungers to permit them to move to engage the clutch-collar at a predetermined point in a revolution of the shaft.

6. In combination, a shaft, a drive part loose thereon, a collar keyed to the shaft and having a socket therein and a cam projection, a clutch collar feathered to the shaft and influenced to normally engage the drive part, said clutch-collar having a peripheral cam groove and a taper-walled recess and also having the ends of its clutch-projections circularly beveled, a bracket fixed laterally of said collar, a plunger yieldingly carried by the bracket and influenced to normally project within said cam groove, a plunger yieldingly carried by the bracket and influenced to normally project within the recess in said clutch collar, a lock-bar carried by the bracket and influenced to normally project within the socket in said keyed collar whereby to lock the same against rotation, said lock-bar having engagement with said two plungers whereby to effect a release of said plungers from the clutch-collar when the lock-bar is moved to release the keyed-collar, and means for moving the lock-bar to effect its release from the keyed collar and a release of the two plungers from the clutch-collar, said means being acted on by said cam projection to release the lock-bar at a predetermined point in a revolution of the shaft to permit it to return to normal position.

In testimony whereof I have hereunto signed my name to this specification in the presence of two subscribing witnesses.

LEONHARD BAUROTH.

Witnesses:

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CORNELE SCHREIBER.