Jan. 8, 1924. 1,480,495

F. E. BESSLER

ATTACHMENT FOR DRILL PRESSES

Filed April 27, 1923 3 Sheets-Sheet 1

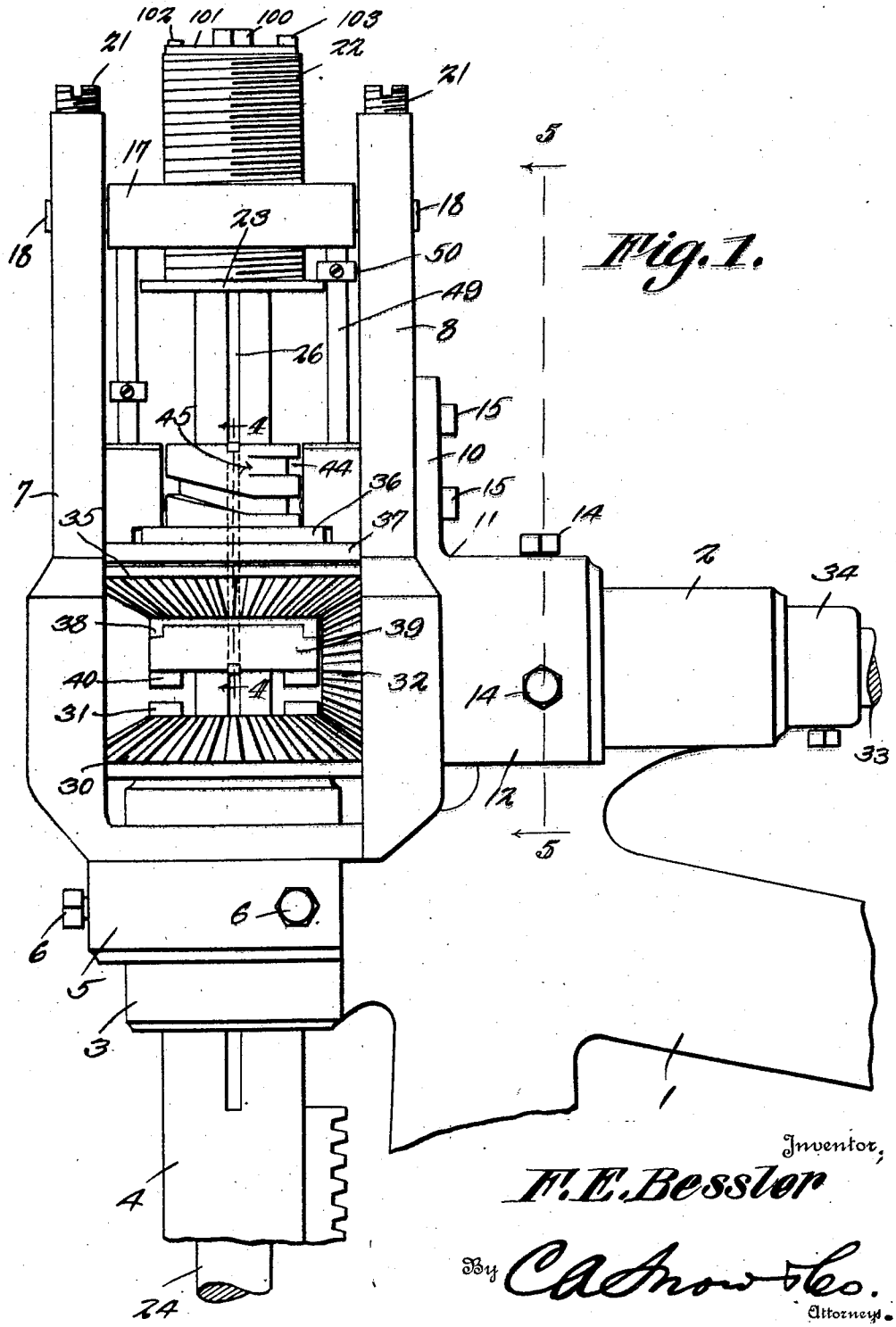


Fig. 1.

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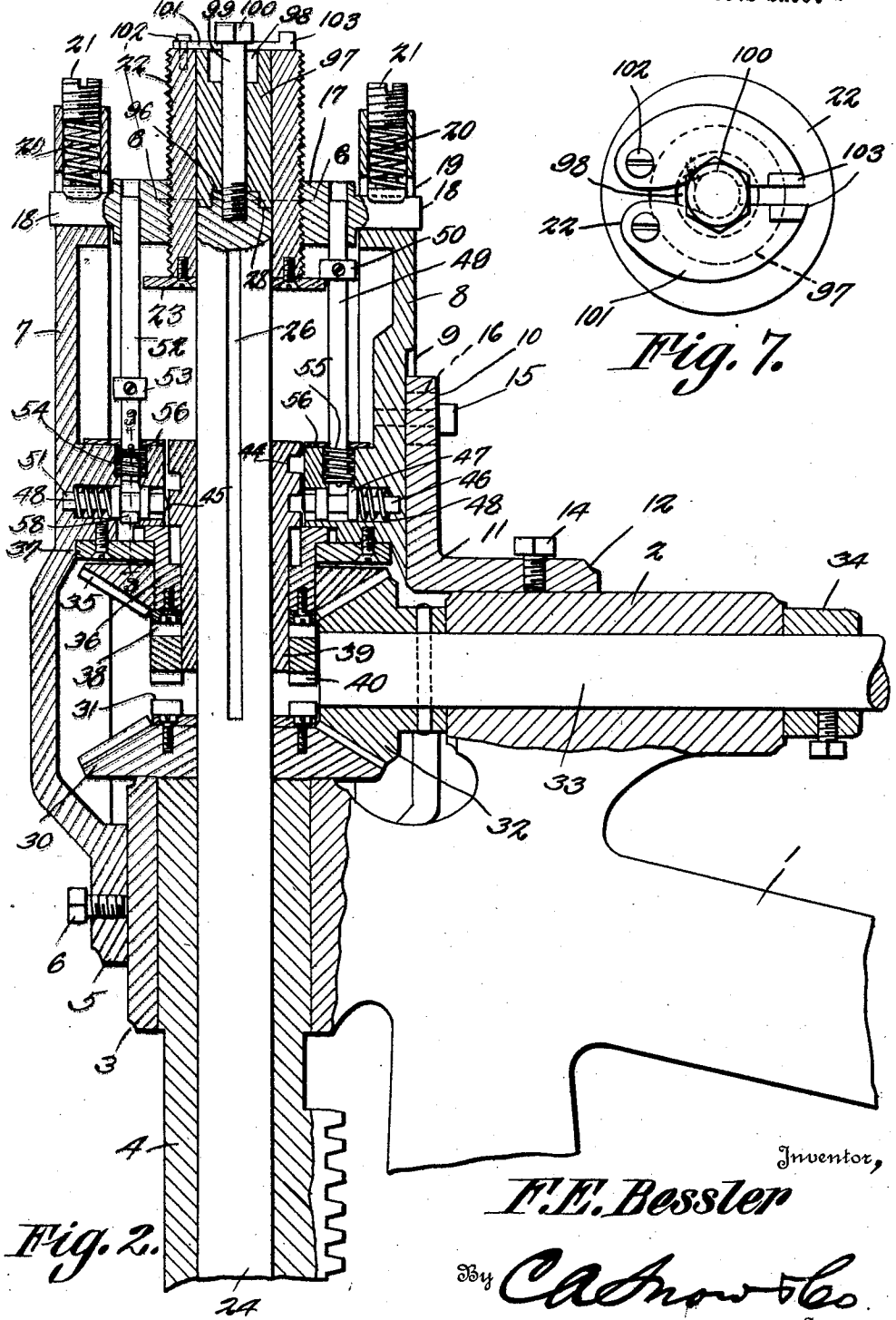


Fig. 2.

Fig. 7.

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Filed April 27, 1923 3 Sheets-Sheet 3

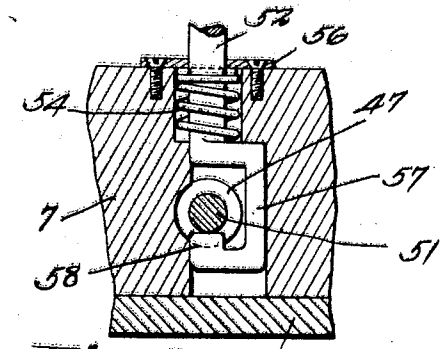


Fig. 3.

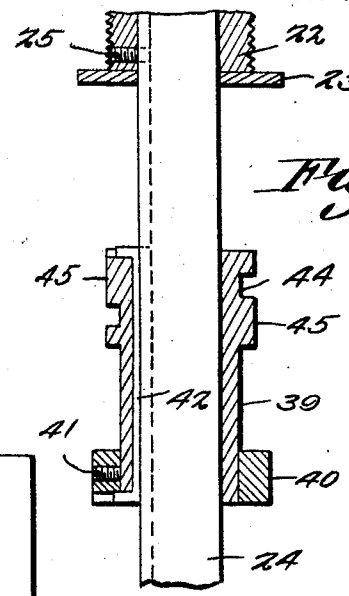


Fig. 4.

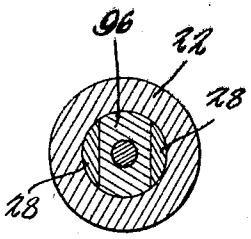


Fig. 6.

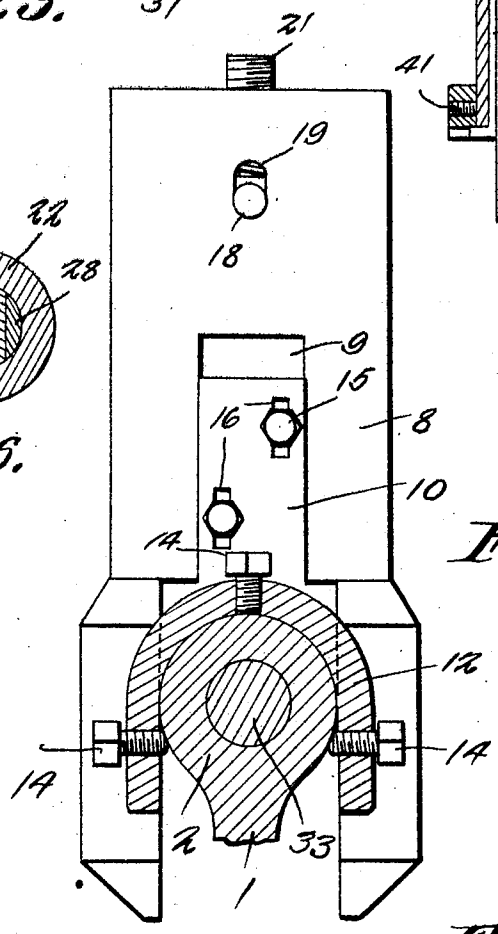


Fig. 5.

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Patented Jan. 8, 1924. 1,480,495

UNITED STATES PATENT OFFICE.

FRANK E. BESSLER, OF AKRON, OHIO.

ATTACHMENT FOR DRILL PRESSES.

Application filed April 27, 1923. Serial No. 635,176.

To all whom it may concern:

Be it known that I, FRANK E. BESSLER, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented a new and useful Attachment for Drill Presses, of which the following is a specification.

The object of this invention is to provide a simple means whereby a drill press may be transformed into a tapping machine.

It is within the province of the disclosure to improve generally and to enhance the utility of devices of that type to which the invention appertains.

With the above and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that, within the scope of what is claimed, changes in the precise embodiment of the invention shown can be made without departing from the spirit of the invention.

In the accompanying drawings:—

Figure 1 shows in side elevation, a device constructed in accordance with the invention; Figure 2 is a vertical section wherein parts remain in elevation; Figure 3 is a fragmental section taken approximately on the line 3—3 of Figure 2; Figure 4 is a section on the line 4—4 of Figure 1; Figure 5 is a section on the line 5—5 of Figure 1; Figure 6 is a cross section on the line 6—6 of Figure 2; Figure 7 is a plan showing the upper end of the screw and parts carried thereby.

The numeral 1 denotes a portion of the frame of a drill press, the frame embodying a horizontal bearing 2 and a vertical bearing 3, the bearing 3 containing a sleeve 4. A yoke 5 is secured at 6 to the bearing 3 and carries a standard 7. A standard 8 is disposed opposite to the standard 7 and has a recess 9 receiving the upright arm 10 of a bracket 11 having an arched foot 12 straddled on the bearing 2 and held thereon by set screws 14. Securing elements 15 unite the arm 10 of the bracket with the standard 8 as shown in Figure 5, the arm 10 having elongated slots 16 receiving the securing elements 15 and permitting adjustment.

A support 17 is located between the standards 7 and 8, and has reduced ends 18 received in vertically elongated slots 19 formed in the standards 7 and 8. Compression springs 20 are located in the upper ends of the standards 7 and 8, and thrust the ends 18 of the support 17 downwardly, the springs 20 being retained under compression, and their compressive efforts being adjusted through the instrumentality of screws 21 threaded into the upper ends of the standards 7 and 8.

A tubular screw 22 is threaded into the support 17 and is provided at its lower end with an outstanding projection 23, which may be in the form of a washer, secured to the screw. A first shaft 24, which forms part of the drill press, is journaled for rotation in the sleeve 4. The upper end of the shaft 24 enters the tubular screw 22. The upper end of the shaft 24 is provided with a projection 96, received and held against rotation between the fingers 28 of the block or core 97 held fixed in the screw 22, the screw 22 having a recess 98 in its upper end. A securing element 99, such as a screw, is connected at its lower end to the shaft 24 and is mounted to slide and to rotate in the block 97, the screw having a head 100, adapted to be received in the recess 98. Latches 101 are pivoted at 102 to the screw 22 and have finger pieces 103 for their manipulation. The latches 101 engage beneath the head 100 of the screw 99 which forms part of the shaft 24 and holds the projection 96 of the shaft 24 between the fingers 28 of the block 97, the shaft 24 thus being held to the screw 22, for rotation with the screw and for longitudinal movement therewith.

A beveled pinon 30 is located between the standards 7 and 8, the shaft 24 passing through the beveled pinion. The beveled pinion constitutes a part of the drill press, but, in the present embodiment of the invention, the beveled pinion 30 is not secured to the shaft 24. A clutch element 31 is attached to the upper surface of the hub portion of the beveled pinion 30. The beveled pinion 30 meshes into a beveled pinion 32 on a shaft 33 journaled in the bearing 2. A set collar 34 is mounted on the shaft 33, and this set collar, together with the hub of the pinion 32, prevents the shaft 33 from moving endwise in the bearing 2. The beveled pinion 32 on the shaft 33 meshes into a beveled pinion 35 having a hub 36. A retaining ring 37 is secured to the standards 7 and 8, and, co-operating with the hub 36 of the beveled pinion 35, retains the beveled pinion for

rotation on the standards 7 and 8. A clutch element 38 is attached to the lower end of the hub 36 of the beveled pinion 35.

A clutch sleeve 39 is mounted for sliding movement on the shaft 24 and operates through the hub 36 of the beveled pinion 35. To the lower end of the clutch sleeve 39 a clutch 40 is secured as shown at 41. A key 42 is mounted in the clutch sleeve 39, the ends of the key engaging the ends of the sleeve. The key 42 is received slidably in the key-way 26 of the shaft 24, and, thus, the clutch sleeve 39 is coupled to the shaft 24, for rotation with the shaft and for sliding movement longitudinally of the shaft. The clutch sleeve 39 has an external circumscribing cam groove 44. The ends of the cam groove 44 run out flush with the outer surface of the sleeve, as clearly indicated by the reference numeral 45 in Figures 1 and 2.

A movable member 46, in the form of a pin, is mounted for sliding movement in the standard 8 transversely of the standard, The movable member or pin 46 has outstanding flanges 47. The movable member 46 is thrust toward the shaft 24 by a compression spring 48 located in the standard. A latch rod 49 is mounted for vertical sliding movement in the support 17 and in the standard 8, the latch rod carrying an adjustable collar 50 disposed above the projection 23. A movable member 51 is mounted to slide in the standard 7, transversely of the standard, and is advanced by a spring 48 of the sort hereinbefore described. A latch rod 52 is mounted to slide vertically in the support 17 and in the standard 7. The latch rod 52 carries an adjustable collar 53 located below the projection 23 on the screw 22. The latch rod 49 is thrust downwardly by a spring 55, the latch rod 52 being thrust upwardly by a spring 54, the springs being located beneath cover pieces 56 carried by the standards 7 and 8. The lower end of the latch rod 49 engages the upper edge of the pin 46, the latch rod 52 having an offset arm 57, shown in Figure 3, the arm 57 having an upstanding finger 58 cooperating with the lower edge of the movable member or pin 51.

Let it be supposed that the clutch 40 is engaged with the clutch element 31 on the beveled pinion 30. Then, when the shaft 33 is rotated, the beveled pinion 32 will rotate the beveled pinion 30, and, since the pinion 30 is connected to the shaft 24 by the clutch 40, the shaft 24 will be rotated, the shaft 24 moving downwardly, as it rotates, because the screw 22 is threaded into the support 17. Clearly, the operation above described will serve to carry downwardly, the tapping element (not shown) on the lower end of the shaft 24. Suppose, however, that the clutch 40 has been raised, until it cooperates with the clutch element 38 on the hub 36 of the beveled pinion 35. Then, when the shaft 33 and the beveled pinion 32 are rotated, the beveled pinion 35 will be rotated, reverse rotation will be imparted to the shaft 24, and the shaft 24, together with the tapping element thereon, will be elevated, since, as hereinbefore mentioned, the screw 22 is threaded into the support 17. If the pitch of the thread cut by the tapping element differs from the thread of the screw 22, the end portions 18 of the support 17 will rise in the slots 19, the springs 20 being compressed.

It has been pointed out hereinbefore, that the clutch 40 is shifted to couple either the beveled pinion 30 or the beveled pinion 35 to the shaft 24, thereby to secure a direct or a reverse rotation of the shaft 24. The means for accomplishing this result will now be explained.

When the shaft 24 and the screw 22 arrive at a point adjacent to the upper end of their travel, the projection 23 engages the collar 50 on the latch pin 49 and elevates the latch pin, so that the latch pin is no longer between the flanges 47 of the movable member or pin 46. Thereupon, the movable member or pin 46 is advanced by the action of the spring 48, the inner end of the member 46 moving into the cam groove 44 in the clutch sleeve 39. The clutch sleeve 39 is keyed at 42 to the shaft 24 and rotates with the shaft. When, therefore, rotation is imparted to the clutch sleeve 39, the clutch sleeve will be moved downwardly, because the inner end of the movable member 46 is engaged in the cam groove 44, and, in this way, the clutch member 40 will be engaged with the clutch member 31 of the beveled pinion 30. When the clutch sleeve 39 arrives at the limit of its downward travel, the inner end of the movable member 46 rides out of the cam groove 44, at the upper end of the cam groove, and rides upon the extreme outer surface of the sleeve 39, the movable member 46 being thrust backwardly or outwardly, into the position shown in Figure 2. The spring 55 now reasserts itself and slides the latch rod 49 downwardly, the latch rod engaging between the flanges 47 of the member 46, to hold the member 46 retracted, as shown in Figure 2 of the drawings.

When the shaft 24 and the screw 22 arrive adjacent to the limit of their downward travel, the projection 23 engages the collar 53 on the latch rod 52, and slides the latch rod downwardly, the finger 58 of Figure 3 being disengaged from between the flanges 47 of the left hand movable member 51. Under such circumstances, the inner end of the movable member 51, under the action of the corresponding spring 48, will move inwardly, and enter the cam groove 44 of the clutch sleeve 39 at the upper end of the cam groove. When rotation is imparted to the

clutch sleeve 39, from the shaft 24, by way of the key 42, the clutch sleeve 39 will be moved upwardly, and the clutch 40 will be engaged with the clutch 38 on the hub 36 of the beveled pinion 35. When the movable member 51 arrives at the lower end of the cam groove 44 in the clutch sleeve 39, the inner end of the said movable member rides out of the cam groove, onto the extreme outer surface of the clutch sleeve, the movable member being thrust outwardly, into the position shown in Figure 2 of the drawings. Thereupon, the spring 54 reacts on the latch rod 52 and slides the latch rod 52 upwardly until the finger 58 of the latch rod engages between the flanges 47 of the movable member 51, as shown in Figure 3, the movable member, thus, being held retracted.

The set collars 53 and 50 may be moved, respectively, along the rod 52, and along the rod 49 for purposes of adjustment.

The latches 100 may be disengaged from beneath the head 100, thereby permitting the shaft 24 to move downwardly, the head being received in the recess 98, the projection 96 on the upper end of the shaft 24 being disengaged from between the fingers 28 of the core 97 of the screw 22. The shaft 24 thus is uncoupled from the screw 22, and the device may be run as an ordinary drill press.

Having thus described the invention, what is claimed is:—

1. In a device of the class described, a frame; a first shaft journaled in the frame and movable longitudinally therein; means for establishing threaded connection between the first shaft and the frame; first pinions loose on the first shaft; a second shaft journaled in the frame; a pinion on the second shaft and meshing with the first pinions; a clutch operating to connect either of the first pinions to the first shaft; and mechanism responsive to the rotation of the first shaft for actuating the clutch.

2. A device of the class described, constructed as set forth in claim 1 and further characterized by the fact that said means embodies a yieldably mounted support slidable in the frame.

3. In a device of the class described, a frame; a first shaft journaled on the frame and movable longitudinally therein; means for establishing threaded connection between the first shaft and the frame; first pinions loose on the first shaft; a second shaft journaled in the frame; a pinion on the second shaft and meshing with the first pinions; a clutch operating to connect either of the first pinions with the first shaft and having a cam groove, the clutch being splined to the shaft to slide therealong; members slidable in the frame; means for advancing said members one at a time to engage in the cam groove, the cam groove being shaped to retract said members one at a time; latches cooperating with said members to hold the same retracted; means responsive to the longitudinal movement of the first shaft to operate the latches.

4. In a device of the class described, a frame; a shaft journaled in the frame and slidable longitudinally therein; means for imparting longitudinal movement to the shaft when the shaft is rotated; driven elements loose on the shaft; means for rotating said elements simultaneously; a clutch splined to the shaft and having a cam groove, the clutch operating to connect either of said elements to the shaft; members slidable in the frame; means for advancing said members one at a time to engage in the cam groove, the cam groove being shaped to retract said members, one at a time; latches cooperating with the said members, to hold the same retracted; and means responsive to the longitudinal movement of the shaft for operating the latches.

5. In a device of the class described, a frame; a shaft journaled in the frame and slidable longitudinally therein; means for imparting longitudinal movement to the shaft when the same is rotated; driven elements loose on the shaft; means for rotating said elements simultaneously; a clutch operating to connect either of said elements to the shaft, the clutch being splined to the shaft to slide thereon; members movable in the frame and cooperating with the clutch to impart longitudinal movement to the clutch when the clutch is rotated, the clutch being shaped to retract said members; latches slidable on the frame and cooperating with the said members to hold the same retracted; means for advancing the said members; and cooperating elements on the latches, and carried by the shaft, for operating the latches.

6. A device of the class described constructed as set forth in claim 5, and further characterized by the fact that those of the cooperating elements which are on the latches, are adjustable longitudinally of the latches, means being provided for holding the said elements in adjusted positions on the latches.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

FRANK E. BESSLER.

Witnesses:
JAMES R. THOMAS,
O. J. SWINEHART.