

No. 760,089.

PATENTED MAY 17, 1904.

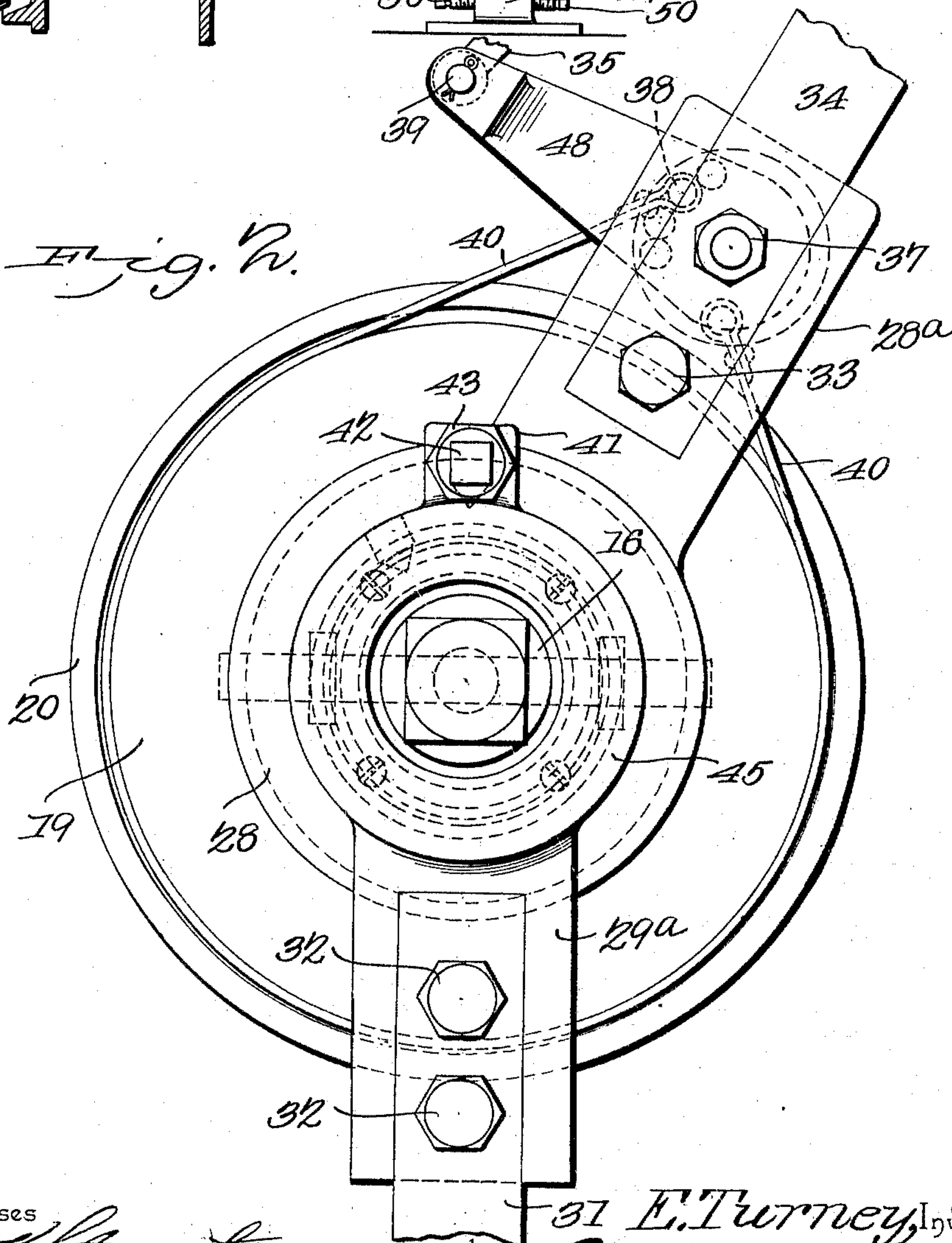
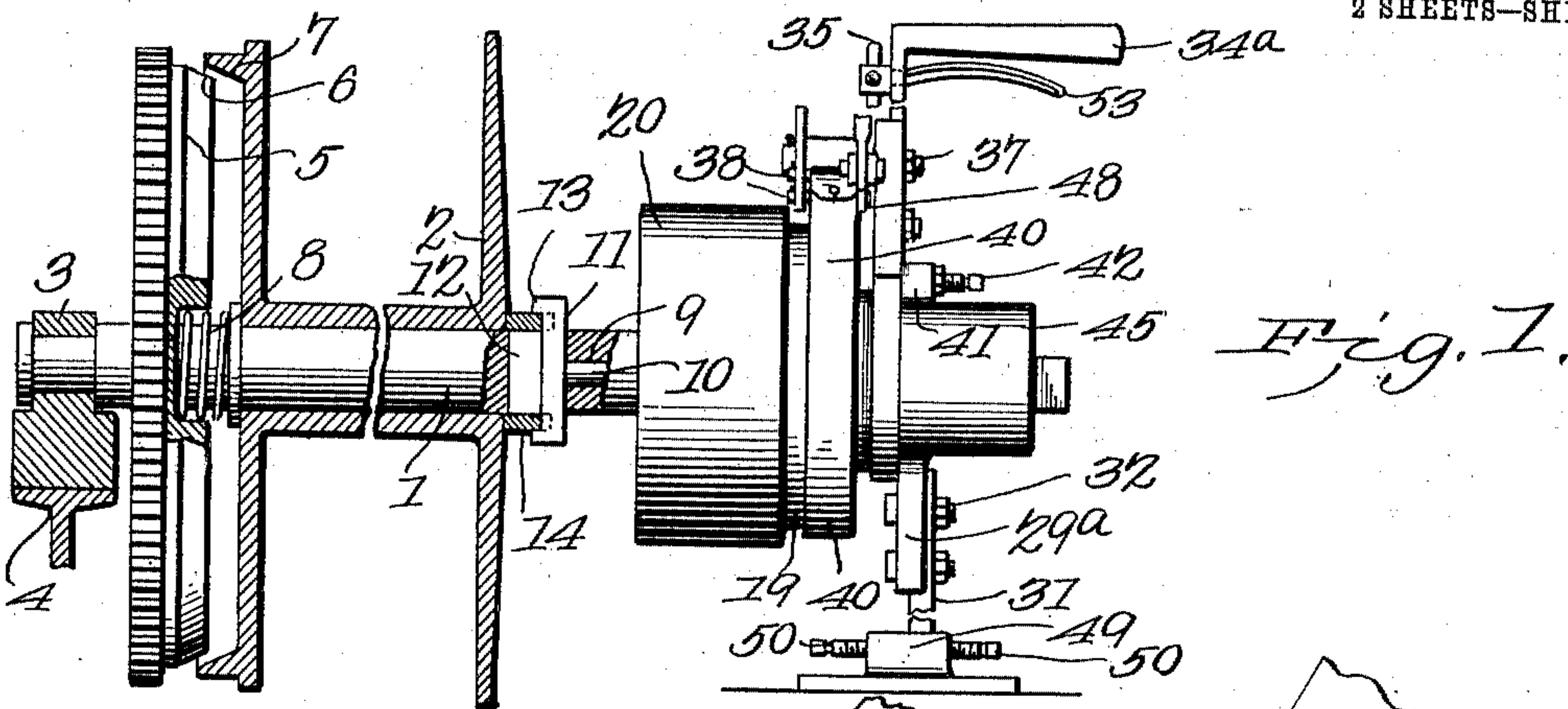
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MECHANISM FOR OPERATING FRICTION CLUTCHES.

APPLICATION FILED SEPT. 4, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses  
*E. H. Stewart*  
*Baxter Morton*

by *E. Turney*, Inventor.  
*C. A. Snow*  
Attorneys



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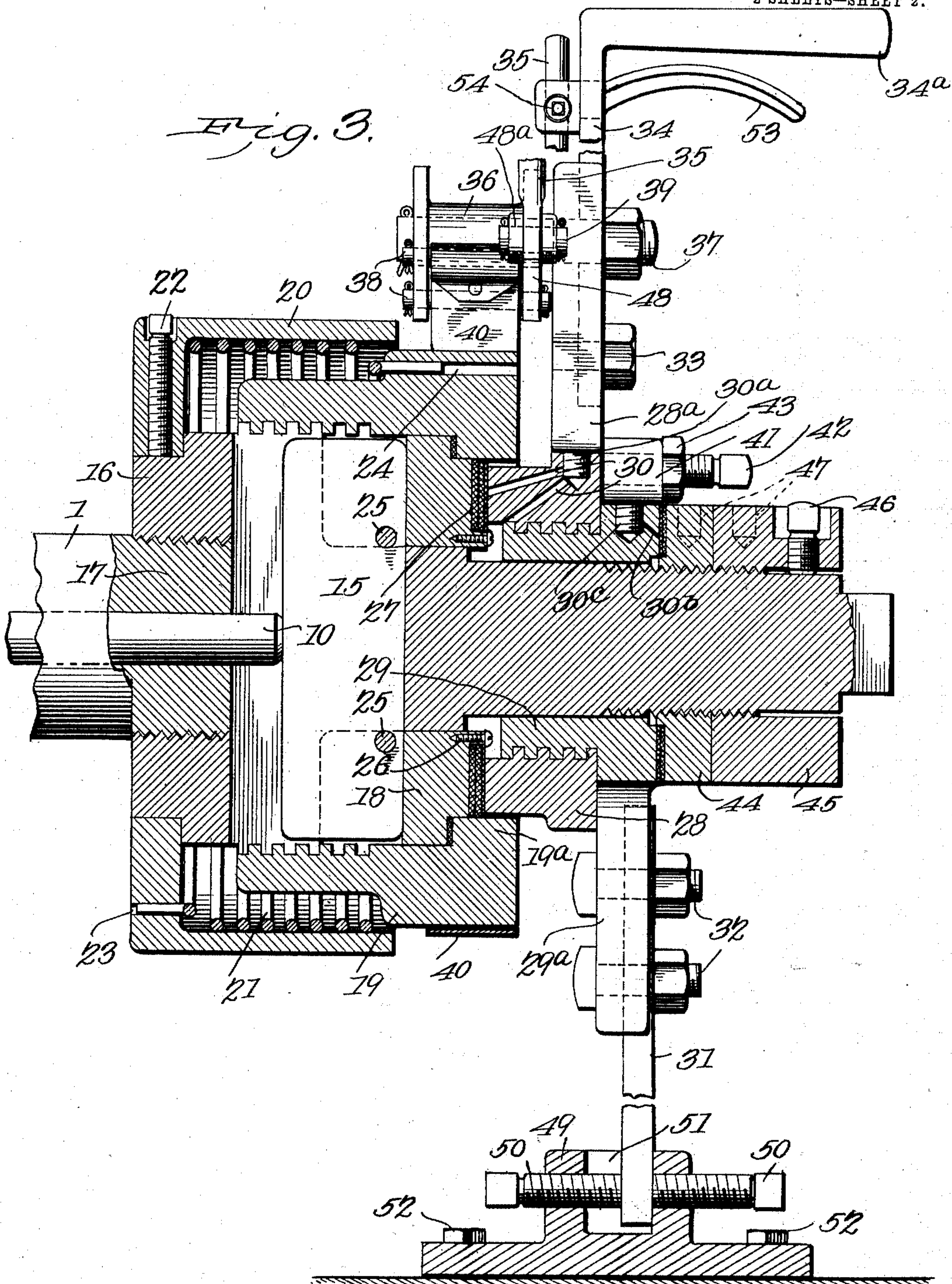
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*E. F. Stewart*  
*Dexter Morton*

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# UNITED STATES PATENT OFFICE.

EDWARD TURNEY, OF PORTLAND, OREGON, ASSIGNOR OF ONE-FOURTH  
TO HARRY L. TURNEY, OF PORTLAND, OREGON.

## MECHANISM FOR OPERATING FRICTION-CLUTCHES.

SPECIFICATION forming part of Letters Patent No. 760,089, dated May 17, 1904.

Application filed September 4, 1903. Serial No. 171,998. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD TURNEY, a citizen of the United States, residing at Portland, in the county of Multnomah and State of Oregon, have invented a new and useful Mechanism for Operating Friction-Clutches, of which the following is a specification.

This invention relates to certain improvements in mechanism for operating friction-clutches; and it consists in the improvements hereinafter specified upon the clutch-operating mechanism disclosed in Letters Patent of the United States No. 728,521, granted to me on May 19, 1903.

The principal object of the invention is to provide in a clutch-operating mechanism adapted for the automatic return of the several parts to inoperative position after the disengagement of the clutch means for reducing the friction by throwing all of the strain incident to the operation of the mechanism upon the shaft and the extension thereof upon which the operating mechanism is supported.

A further object of the invention is to reduce the number of parts, simplify the construction, and lessen the cost of a clutch-operating mechanism of the character specified.

With the objects above mentioned and others in view the invention is embodied in the novel construction and arrangement of parts hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims.

In the drawings, Figure 1 is a view, partly in side elevation and partly in section, of a clutch with the clutch-operating mechanism associated therewith. Fig. 2 is a view in end elevation of the clutch-operating mechanism. Fig. 3 is a view in longitudinal section through the clutch-operating mechanism, the view being made on a larger scale than the preceding view to show the details of construction.

In the drawings, in which similar numerals of reference are employed to indicate the corresponding parts throughout the several views, 1 designates a shaft which may carry a friction-clutch of any preferred design, but which preferably bears a spool or winding-drum 2.

The shaft 1 is mounted for rotation in suitable bearings, as 3, carried upon the frame or bed of an engine, a portion of which is indicated at 4. The shaft is provided near one end with a clutch-disk 5, having a laterally-projecting beveled flange or rim 6, and the spool or drum is provided with a flange 7, whose inner face is inclined for frictional engagement with the flange or rim 6 when the spool or drum is moved toward the disk 5 against the tension of the spiral compression-spring 8, thereby to lock the spool or drum to the shaft 1 and cause its rotation with the shaft.

The shaft 1 is provided with an axial bore or passage 9 for the reception of a longitudinally-movable clutch-operating member 10, which will preferably be provided at its end with a transversely-disposed head 11, movable in a diametrical slot 12 through the shaft and provided at its extremities with lugs 13 for engagement with a collar 14, slidable on the shaft and bearing against the inner end of the spool 2.

The mechanism thus far described is that of a clutch patented to me August 20, 1901, by Letters Patent 680,900 and forms no part of the present invention, the structure being illustrated in order to show one application of the clutch-operating mechanism hereinafter to be described.

Referring to Fig. 3, 16 designates a nut threaded on a reduced terminal 17 of the shaft 1 and forming a support for the clutch-operating mechanism. The nut 16 is slotted adjacent to the end of the shaft 1 for the reception of a transversely-disposed key 15, which will preferably be made of tool-steel and which will when the nut is in position on the end of the shaft lie in contact with the end of the longitudinally-movable clutch-operating member 10, which projects beyond the end of the shaft 1, as shown in Fig. 3. The slot within which the key 15 is disposed is large enough to permit a certain amount of movement of the key longitudinally in the axial line of the clutch-operating member 10, and the key is held against movement crosswise of the nut by retention-pins 25, extending through the key on



either side of the nut 16. Loose upon the nut 16 at the inner side of the key 15 is a collar 18, and threaded upon the outside of the nut 16 in position to engage with the collar 18 is a thrust-nut 19, having at one end an inwardly-disposed flange 19<sup>a</sup>, which engages with a rabbet formed for that purpose on the collar 18. The thrust-nut 19 is held normally in the position shown in Fig. 3 by means of a spring 21, having one end inserted in an opening 23 in a collar 20, secured upon the nut 16 by means of clamp-screws 22 and encircling the nut 16 and the thrust-nut 19. The spring 21 is coiled in the space between the collar 20 and thrust-nut 19 and has one end inserted in an opening 24, provided in the thrust-nut.

On the inner side of the collar 18 the supporting-nut 16 is reduced in diameter and has loosely mounted thereon a thrust-collar 29, having on one side a socket 29<sup>a</sup> and in which is secured an arm 31 by means of bolts 32. The collar 29 is externally threaded and has in threaded engagement therewith a thrust-nut 28, bearing a socket 28<sup>a</sup>, in which is secured, by means of a screw 33, a lever 34, having at the outer end thereof a handle 34<sup>a</sup>. The thrust-collar 29 is adjusted in position upon the supporting-nut 16 by means of the nuts 44 and 45, the latter of which is positively secured in any desired position by means of a small clamping-screw 46, carried thereby and engaging the nut 16. Both the nuts 44 and 45 are provided on their peripheries with drilled openings 47 for the reception of spanners.

The thrust-nut 28 lies adjacent to the collar 18 and is adapted to impart movement thereto by contact with one of a plurality of washers 27, secured upon the face of the collar 18 by means of screws 26. As the friction of engagement of the thrust-nut 28 with the washers 27 will be considerable, the thrust-nut is provided with a plurality of passages 30 for oil, closed at their outer end with a suitable plug 30<sup>a</sup>, and to lessen the friction between the thrust-collar 29 and the nut 44, by which it is secured in position, the oil-passage 30<sup>b</sup>, closed by a lug 30<sup>c</sup>, is provided in the collar 29.

As stated in a previous paragraph, the nut 28 turns upon the collar 29, and to limit the movement in one direction of the nut 28 on the collar there is provided in a lug 41, extending laterally from the collar 29, a set-screw 42, adjusted in position by means of a set-nut 43.

The movement of the collar 29 longitudinally of the reduced portion of the supporting-nut 16 is limited in one direction by the nut 44, as above explained, and to prevent rotary movement of the collar with the nut the arm 31, which is secured in the socket 29<sup>a</sup>, is held in a bracket 49, having a recess 51, by means of oppositely-disposed clamping-screws 50, the bracket 49 being secured, by means of screws 52, upon the engine-frame 4.

Extending through the lever 34 and the

socket 28<sup>a</sup>, in which the lever is seated, is a bolt 37, which assists in retaining the lever in the socket and forms a support for a brake-band connection 36. The brake-band connection is provided with a plurality of pins 38 parallel to the bolt 37, and upon two of the pins 38 are fastened the ends of a brake-band 40, which encircles the thrust-nut 19 and is adapted to engage with a suitable braking-surface formed on the exterior thereof. A lever 48 extends laterally from the brake-band connection 36, with which it is formed integral, and the collar 48<sup>a</sup>, disposed on the bolt 37 between the socket 28<sup>a</sup> and the brake connection 36, spaces the lever 48 far enough through the socket to permit the brake connection to be turned freely upon the bolt 37. At the outer end of the lever 48 there is pivotally connected therewith by means of a pin 39 a rod 35, at the outer end of which is secured, by means of a clamping-screw 54, a handle or finger-latch 53, which extends through a slot in the lever 34 and is disposed substantially parallel to the handle 34<sup>a</sup>.

From the foregoing description it will have been noted that of all of the members of the clutch-operating mechanism the nut 16 is the only one that is rigidly connected with a shaft and that the other members with the exception of the bracket 49 are carried thereon. The bracket 49, which is rigidly mounted upon the engine-frame, receives the lever 31 and serves to hold it against rotation with the nut 16, and the thrust-nut 28, which is mounted on the collar 29, to which the lever 31 is connected, is also held normally stationary upon the collar 29 in the position determined by the set of the screw 42. The brake-band 40, with its ends connected to the rotatable connecting member 36, is normally held by its own elasticity out of braking contact with the surface of the thrust-nut 19, so the thrust-nut 19 revolves with the nut 16.

The action of the spring 21 keeps the collar 19 in the position shown in Fig. 3, with its inwardly-disposed flange just out of contact with the rabbeted face of the collar 18 to prevent frictional engagement therewith. The spring 8, disposed between the clutch members, keeps the longitudinally-movable clutch-operating member 10 normally protruded beyond the end of the shaft 1 in the position shown in the same figure, and the end of said member lies in contact with one face of the key 15.

To operate the mechanism to throw the clutch members into engagement, the lever 34 will be turned a short distance to force the key 15 harder against the clutch-operating member 10, and the handle 53 on the rod 35 will then be drawn outward toward the end of the lever 34, swinging the lever 48 upon the bolt 37 and throwing the brake-band 40 into engagement with the thrust-nut 19 to retard or stop its rotation with the nut 16.



When this is done, the engagement of the threads on the nut 16 with those of the thrust-nut 19 will cause the movement of the thrust-nut 19 outward against the tension of the spiral compression-spring 21, and the flange of the thrust-nut will engage the collar 18 and force it hard against the key 15, which will in turn force the longitudinally-movable member 10 longitudinally of the shaft to bring the clutch members into engagement. When the clutch members engage, the handle 53 will be released, allowing the brake-band 40 to become disengaged from the thrust-nut 19, so that the thrust-nut may again rotate with the nut 16. The collar 19 will be held, however, in position to keep the clutch members in engagement by the friction between the flange on the thrust-nut and the rabbeted face of said collar.

When it is desired to release the clutch, the lever 34 will be moved in the direction in which it was moved to operate the mechanism and the thrust-nut 28 will engage with the collar 18 to force it longitudinally of the shaft 1 sufficiently to move it out of contact with the thrust-nut 19. The frictional engagement of the thrust-nut 19 and the collar 18 being overcome, the thrust-nut 19 will be returned to its initial position by the action of the spring 27, which has been wound by the movement of the thrust-nut in applying the clutch, and at the same time the lever 34 will be returned to its initial position likewise.

By arranging the parts of the clutch-operating mechanism as above described and illustrated in the accompanying drawings the construction is materially simplified, the strain is all applied to the shaft and the supporting-nut 16, which forms an extension thereof, and the cost of manufacture is considerably lessened.

While the construction described and illustrated is that preferred, it is obvious that various changes in the form, proportions, and exact mode of assemblage of the elements of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

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

1. The combination in clutch-operating mechanism of a rotatable shaft, a longitudinally-movable clutch-operating member, a supporting-nut fixed on the end of said shaft, a thrust-nut threaded on the supporting-nut, a thrust-collar loose on the supporting-nut and adapted to be engaged by the thrust-nut, means for retarding or stopping the rotation of the thrust-nut and means adjustable to operative position by the operation of the clutch-operating mechanism for returning the thrust-nut to initial position.

2. The combination in clutch-operating mechanism, of a rotatable shaft, a longitudi-

nally-movable clutch-operating member, a supporting-nut fixed upon the shaft, a thrust-nut threaded on the supporting-nut, a thrust-collar loose on the supporting-nut, means for retarding or stopping the rotation of the thrust-nut, and a spring wound by the movement of the thrust-nut in operating the clutch-operating mechanism for returning the thrust-nut to initial position.

3. The combination in clutch-operating mechanism, of a rotatable shaft, a longitudinally-movable clutch-operating member, a supporting-nut fixed on the shaft, and having a diametral slot, a key disposed in said slot and in contact with the longitudinally-movable member, a thrust-nut threaded on the supporting-nut, a collar loose on the supporting-nut and adapted to be engaged by the thrust-nut, means for retarding or stopping the rotation of the thrust-nut, and means adjustable to operative position by the operation of the thrust-nut in forcing the collar into engagement with the key to return the thrust-nut to initial position.

4. The combination in clutch-operating mechanism, of a rotatable shaft, a longitudinally-movable clutch-operating member, a supporting-nut fixed on the shaft, a thrust-nut threaded on the supporting-nut, a collar loose on the supporting-nut, said thrust-nut having a flange adapted for engagement with said collar, means for retarding or stopping the rotation of the thrust-nut, a spring wound by the operation of the thrust-nut, and means for disengaging the thrust nut and collar when the clutch is in operative position.

5. The combination in clutch-operating mechanism, of a rotatable shaft, a longitudinally-movable clutch-operating member, a supporting-nut fixed on the shaft, a thrust-nut threaded on the supporting-nut, a collar loose on the supporting-nut and adapted to be engaged by the thrust-nut, means for retarding or stopping the rotation of the thrust-nut, a spring wound by the operation of the thrust-nut, and means for effecting independent movement of the collar to disengage it from the thrust-nut when the clutch is in operative position.

6. The combination in clutch-operating mechanism, of a rotatable shaft, a longitudinally-movable clutch-operating member, a supporting-nut fixed on the shaft, a thrust-nut threaded on the supporting-nut, a collar loose on the supporting-nut and adapted to be engaged by the thrust-nut, means for imparting independent movement to said collar, and devices carried by said means for retarding or stopping the movement of the thrust-nut.

7. The combination in clutch-operating mechanism, of a rotatable shaft, a longitudinally-movable clutch-operating member, a supporting-nut threaded on the shaft, a collar loose on the supporting-nut, a thrust-nut threaded on the supporting-nut and adapted



to engage said collar, a member for imparting independent movement to said collar, a brake-band encircling said thrust-nut, and means mounted on the member for imparting independent movement to the collar for forcing the brake-band into engagement with the thrust-nut.

8. The combination in clutch-operating mechanism, of a rotatable shaft, a longitudinally-movable clutch-operating member, a supporting-nut fixed on the shaft, a collar loose on said supporting-nut, a thrust-nut threaded on the supporting-nut and adapted to engage said collar, a spring adjusted to operative position by the operation of said thrust-nut to restore the thrust-nut to initial position, means for imparting independent movement to said collar, a brake-band encircling said thrust-nut, a brake-band connection rotatably mounted on the means for imparting movement to the collar, and means for turning said brake-band connection to tighten the brake-band on the thrust-nut.

9. The combination in clutch-operating

mechanism, of a rotatable shaft, a longitudinally-movable clutch-operating member, a supporting-nut fixed on said shaft, a collar loose on said supporting-nut, a thrust-nut threaded on said supporting-nut and adapted to engage said collar, means for retarding or stopping the rotation of said thrust-nut, a spring wound by the operation of said thrust-nut to return the thrust-nut to initial position, a stationary thrust-collar on said supporting-nut, a second thrust-nut mounted on said thrust-collar and adapted to engage with the loose collar, and a lever rigidly attached to said thrust-nut, said lever bearing the means for retarding or stopping the rotation of the first-mentioned thrust-nut.

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

EDWARD TURNEY.

Witnesses:

C. M. IDLEMAN,

W. HOWARD ZIMMER.