

J. R. McGIFFERT.
 DRUM FOR HOISTING MECHANISMS AND THE LIKE.
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916,581.

Patented Mar. 30, 1909.

Fig. 1

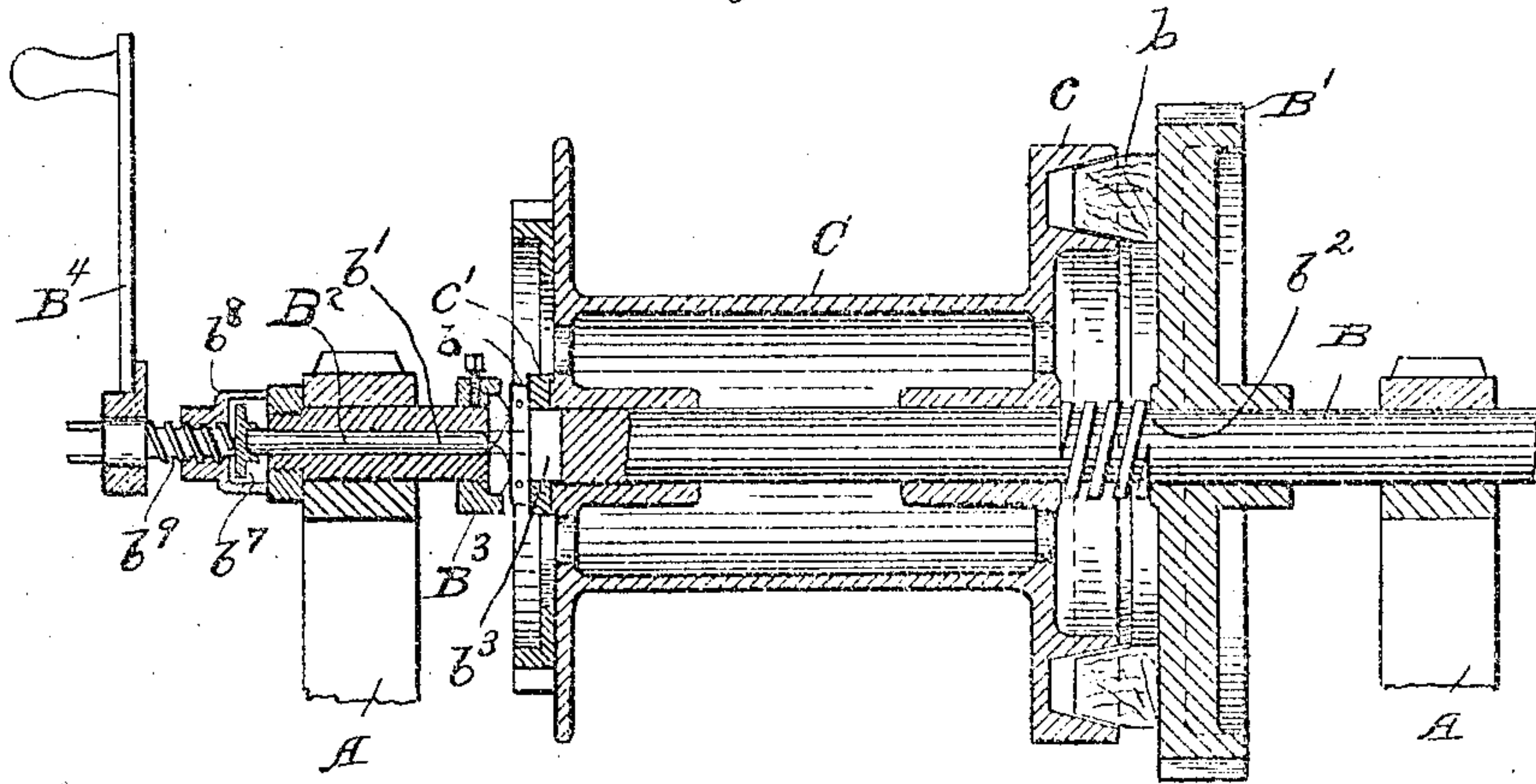
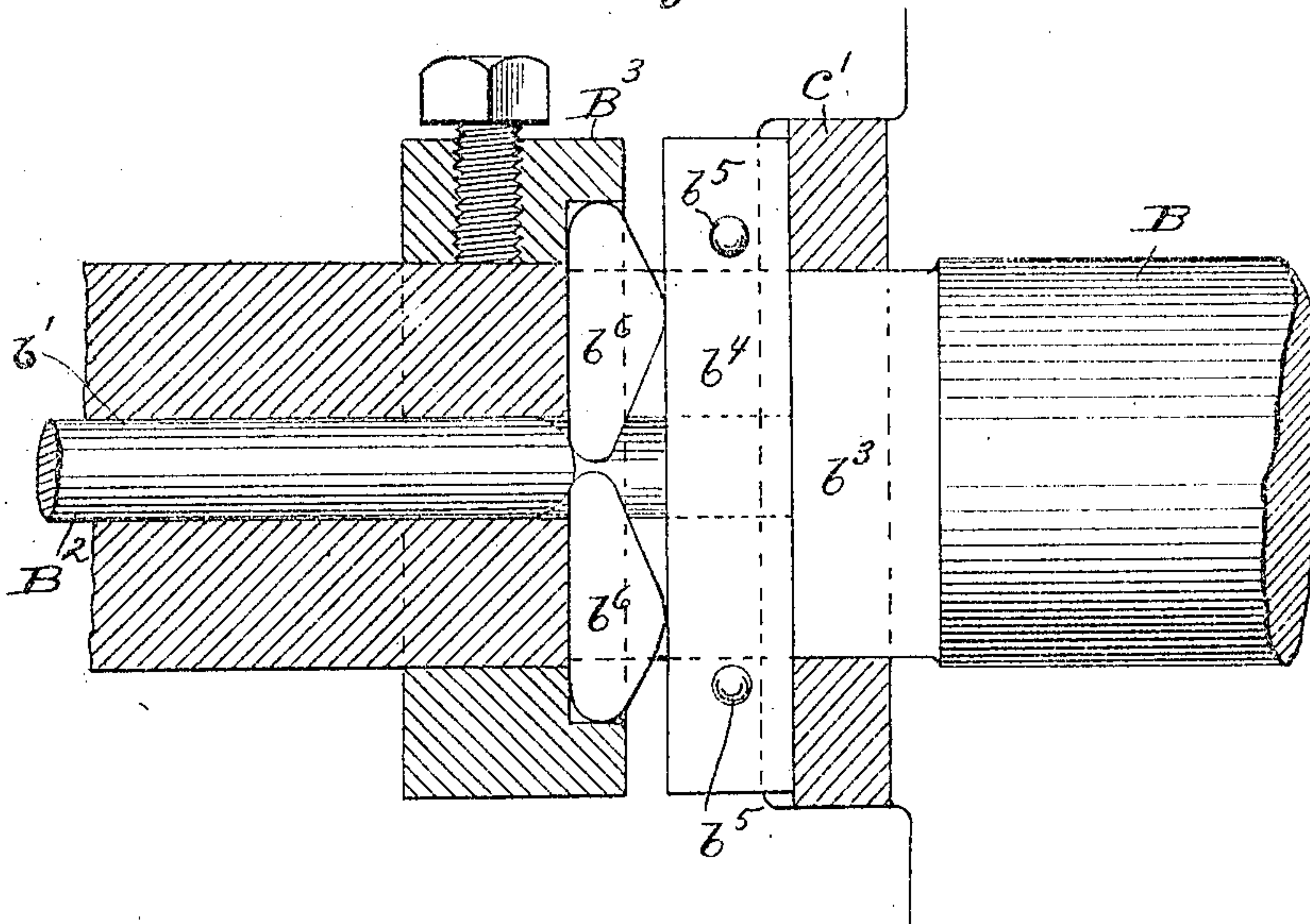


Fig. 2



Witnesses:

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UNITED STATES PATENT OFFICE.

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DRUM FOR HOISTING MECHANISMS AND THE LIKE.

No. 916,581.

Specification of Letters Patent.

Patented March 30, 1909.

Application filed December 28, 1906. Serial No. 349,833.

To all whom it may concern:

Be it known that I, JOHN R. MCGIFFERT, a citizen of the United States, resident of Duluth, county of St. Louis, and State of Minnesota, have invented a new and useful Improvement in Drums for Hoisting Mechanism and the Like, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention relates, as indicated, to improvements in hoisting mechanism, and has regard more particularly to the provision of an improved friction drum, such as is used in connection with mechanism of this character, to operate loading or skidding lines and the like.

Such invention consists of means hereinafter fully described and particularly set forth in the claims.

The annexed drawing and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawing: Figure 1 represents a central longitudinal cross-section of a friction drum and parts appertaining thereto, in which have been embodied the several improvements contemplated by my invention; while Fig. 2 shows a similar cross-sectional view, on a larger scale, of a detail of the mechanism of such drum.

Referring to Fig. 1, it will be noted that A A designate, respectively, the stand bearings of the engine, in which is rotatably supported a shaft B. On the latter, intermediately of the bearings A A, is rotatably mounted the hoisting drum C; and adjacent to one end of such drum, but fixedly mounted on the shaft is a large spur gear B', which, by means of suitable intermediate connection with the hoisting engine, is designed to drive shaft B continuously. The adjacent faces of drum C and spur gear B' are adapted to frictionally engage each other by being respectively provided with a lateral flange c and friction blocks b that are adapted to register with said flange, and frictionally carry the same along. Normally such frictional engagement between flange c and blocks b is prevented by means of a resilient

member, preferably a helical spring b² that surrounds shaft B intermediately of spur gear B' and end of drum C, and retains the latter some distance removed from the former. In order to effect such frictional engagement, and thereby rotation of the drum, the following mechanism is provided: Near the other end of the shaft B, that is, the end opposite spur gear B', there is provided in such shaft a transverse slot b³ within which is slidably mounted a cross-key b⁴, the latter being held against dislodgment from the slot by means of pins b⁵ secured in its respective ends. Such cross-key rests against a loose collar c' that is interposed between it and the adjacent end of drum C. Extending from the proximate end of the shaft B to said slot b³ is a central axial opening or hole b' in which lies a thrust-pin B² mounted so as to be longitudinally reciprocable of the shaft. The inner end of this pin is semi-cylindrically rounded, as shown, Fig. 2, and is adapted to engage the inner ends of two substantially triangular steel blocks b⁶ b⁶, oppositely disposed in slot b³, the outer ends of such blocks bearing against an adjustable set collar B³ mounted on shaft B adjacent to the slot. The vertices of these blocks, respectively, rest against cross-key b⁴. Upon the outer end of longitudinally reciprocable thrust-pin B² is fixedly mounted a bronze disk b⁷ which is inclosed about by a hollow thrust-nut b⁸ spanning the pin end and secured against rotation by being attached to the adjacent stand bearing A or equivalent support. In such thrust-nut b⁸ is mounted the usual thrust-screw b⁹ which is adapted to be rotated by means of a crank B⁴.

The operation of my improved friction drum should be obvious from the foregoing description of its construction. However, by way of conclusion, such operation may be briefly stated as follows: Normally, owing to the action of spring b², drum C does not rotate with shaft B, since the faces of flange c and friction blocks b on driving gear B' do not then engage. When, however, it becomes desirable to have such drum rotate, it is shifted laterally on the shaft B against the pressure of spring b² to effect such frictional engagement. This shifting is accomplished, as will be readily apparent from an inspection of Fig. 1, by a rotation of crank B⁴, whereby the thrust-screw b⁹ is caused to bear against the disk b⁷ mounted on the

outer end of thrust-pin B^2 . The latter is thereby forced inwardly against the inner ends of the triangular blocks b^6 , which blocks, being in effect fulcrumed in the set collar B^3 , exert a lever action on the cross-key b^4 against which they press, and thus upon drum C, through the interposed loose collar c' . When the pressure of the screw on the end of thrust-pin B^2 is released by a counter-rotation of crank B^4 , the effect of spring b^2 is to forthwith restore all the parts to their normal positions, and rotation of the drum thereupon ceases.

In the construction and operation of the drum as above described, I should call attention in the first place to the feature of the triangular blocks interposed between the end of the thrust-pin and the adjacent end of the drum, whereby the force of the reciprocable motion of such thrust-pin is largely augmented through the lever action of such blocks, in effecting lateral movement of the drum. This much reduces the power required to operate the thrust-pin, which otherwise is considerable, the lateral pressure required to be exerted on the drum being, in engines of ordinary size, frequently close on to 10,000 lbs. Not only is this benefit obtained, but the very rapid wear of these parts due to such tremendous pressure, when as in the usual construction the pressure is received directly on the end of the thrust-pin, is to a large extent reduced. This is due not so much to the material, steel, of which the blocks are formed, as above stated, but because they do not themselves move on the parts on which they bear after once they are placed in operating position. Furthermore, such slight wear as does take place may be readily taken up by a proper adjustment of set collar B^3 , thus enabling the thrusting mechanism to be always maintained in proper adjustment relatively to the drum. The thrust-screw box or nut b^7 is intended to contain lubricant, and while I do not claim the employment of such a box in itself as presenting novel features, yet I would call attention, as forming a second feature of my improved drum, to the disk rigidly mounted on the end of the thrust-pin and housed within this box or nut. It will be remembered that the inner end of the thrust-screw is forced against this disk when it is desired to have the drum rotate. This disk being made of hard bronze forms an excellent and enduring bearing surface, and furthermore,—and more important, since the lower portion of it constantly turns in the oil or other lubricant in the hollow box or thrust-nut,—there will be an opportunity every time that the thrust-screw is turned off, which, of course, is quite frequent, for the oil to run down over the face of the disk and thus lubricate the center of the disk with which the end of the screw comes in contact.

This result is obviously not attained where such end of the thrust-screw bears directly on the end of the thrust pin, even though the end of the shaft B and of such thrust pin be incased similarly in a hollow nut supplied with lubricant.

Having thus described my invention in detail, that which I particularly point out and distinctly claim, is:

1. The combination with a driving shaft and a drum normally rotatable upon said shaft, said shaft and drum being relatively axially shiftable to secure the latter to the former; of means for effecting such relative shifting, such means comprising a thrust pin longitudinally reciprocable in said shaft, and a lever member interposed between the end of said pin and said drum, said member having its one end fulcrumed on said shaft and the other engaging said pin, and being connected with said drum intermediately of such ends.

2. The combination with a driving shaft and a drum normally rotatable upon said shaft, said shaft and drum being relatively axially shiftable to secure the latter to the former; of means for effecting such relative shifting, such means comprising a thrust pin centrally mounted in said shaft and longitudinally reciprocable thereof, a collar adjustably mounted upon said shaft, and a plurality of radially disposed lever-members having their outer ends fulcrumed in said collar and their inner ends engaging said pin, and connected with said drum intermediately of such ends.

3. The combination with a driving shaft and a drum normally rotatable upon said shaft but axially shiftable into operative engagement therewith, of means for thus shifting said drum, such means comprising a thrust-pin longitudinally reciprocable in said shaft, a collar adjustably mounted upon said shaft, and a lever-member interposed between the end of said pin and said drum, said member being fulcrumed in said collar.

4. The combination with a driving shaft and a drum normally rotatable upon said shaft but axially shiftable into operative engagement therewith, of means for thus shifting said drum, such means comprising a thrust-pin longitudinally reciprocable in said shaft, a collar adjustably mounted upon said shaft, and a lever-member interposed between the end of said pin and said drum, said member having its one end fulcrumed in said collar and the other engaging said pin, and bearing against said drum intermediately of such ends.

5. The combination with a driving shaft and a drum normally rotatable upon said shaft but axially shiftable into operative engagement therewith, of means for thus shifting said drum, such means comprising a thrust-pin longitudinally reciprocable in said

shaft, and a lever-member interposed between the end of said pin and said drum, said member having its one end fulcrumed on said shaft and the other engaging said pin, and being connected with said drum immediately of such ends.

6. The combination with a driving shaft and a drum normally rotatable upon said shaft but axially shiftable into operative engagement therewith, of means for thus shifting said drum, such means comprising a thrust-pin centrally mounted in said shaft and longitudinally reciprocable thereof, and a plurality of radially disposed lever-members having their outer ends fulcrumed on said shaft and their inner ends engaging said pin, and connected with said drum immediately of such ends.

7. The combination with a driving shaft and a drum normally rotatable upon said shaft but axially shiftable into operative engagement therewith, of means for thus shifting said drum, such means comprising a thrust-pin centrally mounted in said shaft and longitudinally reciprocable thereof, a key transversely mounted in said shaft opposite the end of said thrust pin and bearing against the end of said drum, a longitudinal slot being provided in said shaft for the reception of said key, and two lever members oppositely disposed in such slot, said members having their outer ends fulcrumed on said shaft and their inner ends engaging said pin, and bearing against said key immediately of such ends.

8. The combination with a driving shaft and a drum normally rotatable upon said shaft but axially shiftable into operative engagement therewith, of means for thus shifting said drum, such means comprising a thrust-pin centrally mounted in said shaft and longitudinally reciprocable thereof, a member interposed between the end of said drum and said pin and adapted to have a lever action on said drum, and another member adjustably mounted on said shaft and engaging the outer end of said first member so as to provide a fulcrum therefor.

9. The combination with a driving shaft and a drum normally rotatable on said shaft but axially shiftable into operative engagement therewith, of means for thus shifting said drum, such means comprising a thrust-pin mounted in said shaft and longitudinally reciprocable thereof, and oppositely-disposed angular members loosely interposed between the end of said pin and of said drum, said members being fulcrumed on said shaft and having a lever action upon said drum.

10. The combination with a driving shaft and a drum normally rotatable upon said shaft but axially shiftable into operative engagement therewith, of means for thus shifting said drum, such means comprising a thrust-pin centrally mounted in said shaft

and longitudinally reciprocable thereof, and two oppositely-disposed substantially triangular blocks interposed between the end of said pin and said drum, and adapted to have a lever action on the latter.

11. The combination with a driving shaft and a drum normally rotatable upon said shaft but axially shiftable into operative engagement therewith, of means for thus shifting said drum, such means comprising a thrust-pin centrally mounted in said shaft and longitudinally reciprocable thereof, a key transversely mounted in said shaft opposite the end of said thrust-pin and bearing against the end of said drum, a longitudinal slot being provided in said shaft for the reception of said key, and triangular blocks interposed between said thrust pin and said key and adapted to have a lever action on the latter.

12. The combination with a driving shaft and a drum normally rotatable upon said shaft but axially shiftable into operative engagement therewith, of means for thus shifting said drum, such means comprising a thrust-pin centrally mounted in said shaft and longitudinally reciprocable thereof, a key transversely mounted in said shaft opposite the end of said thrust-pin and bearing against the end of said drum, a longitudinal slot being provided in said shaft for the reception of said key, two oppositely-disposed, substantially triangular blocks interposed between said thrust-pin and said key and adapted to have a lever action on the latter, and a set collar adjustably mounted on said shaft and forming a fulcrum for said blocks.

13. In mechanism of the class described, the combination of a shaft, a spur gear fixedly mounted thereon for driving the same, a drum rotatably mounted on said shaft but axially shiftable into frictional engagement with said driving gear, a spring interposed between said drum and gear and normally preventing such engagement, and means for shifting said drum thus into engagement, such means comprising a thrust-pin centrally mounted in said shaft and longitudinally reciprocable thereof, a key transversely mounted in said shaft opposite the end of said thrust-pin, a longitudinal slot being provided in said shaft for the reception of said key, a loose collar interposed between said key and said drum, two oppositely-disposed, substantially triangular blocks interposed between said thrust-pin and said key and adapted to have a lever action on the latter, and a set collar adjustably mounted on said shaft and forming a fulcrum for said blocks.

Signed by me, this 24th day of December, 1906.

JOHN R. McGIFFERT.

Attested by—

N. M. NELSON,

EDITH M. JEFFERY.