

No. 751,740.

PATENTED FEB. 9, 1904.

J. LUNDGREN.
POWER SHIFTER.

APPLICATION FILED SEPT. 3, 1902. RENEWED JULY 14, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 2.

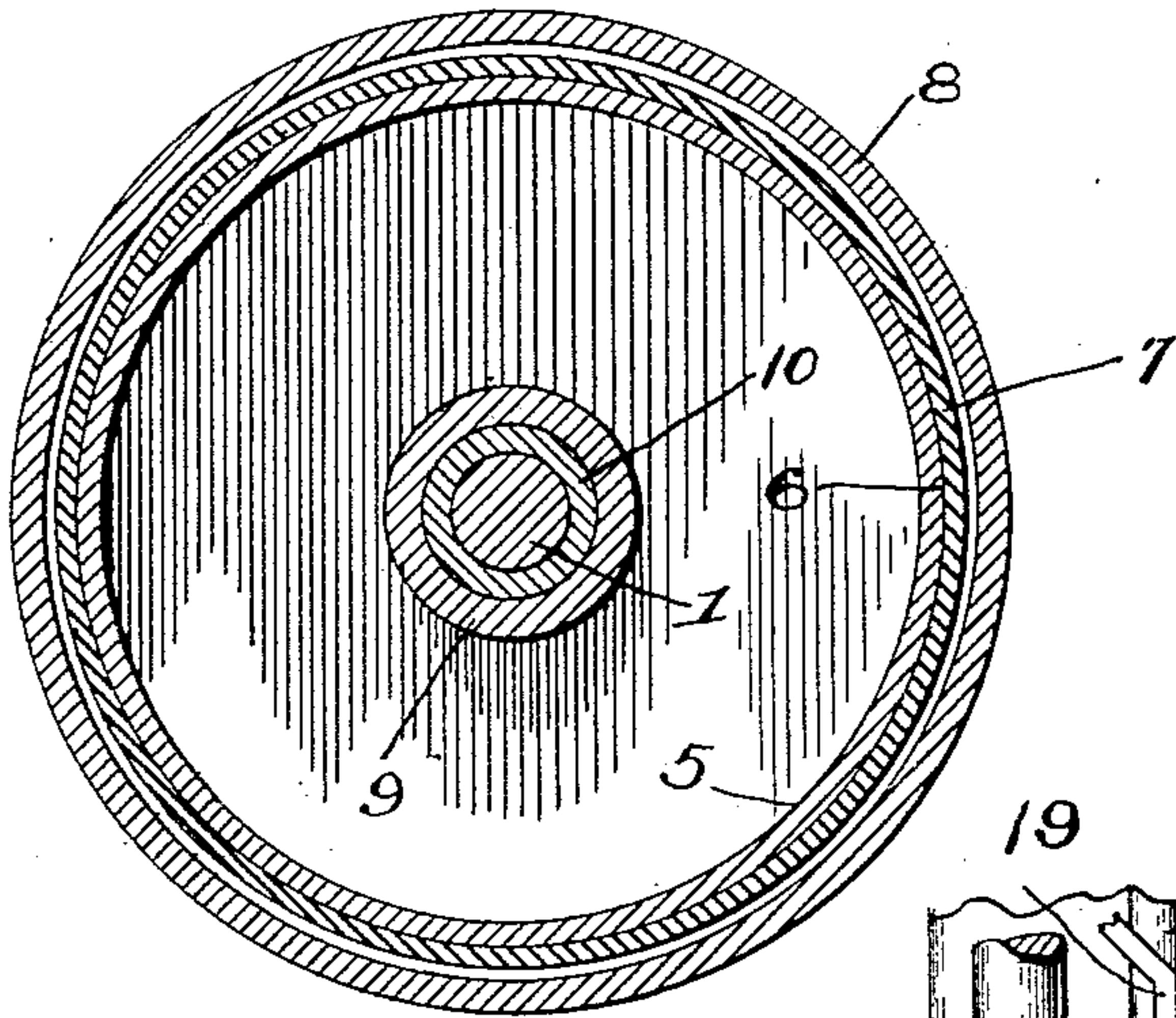
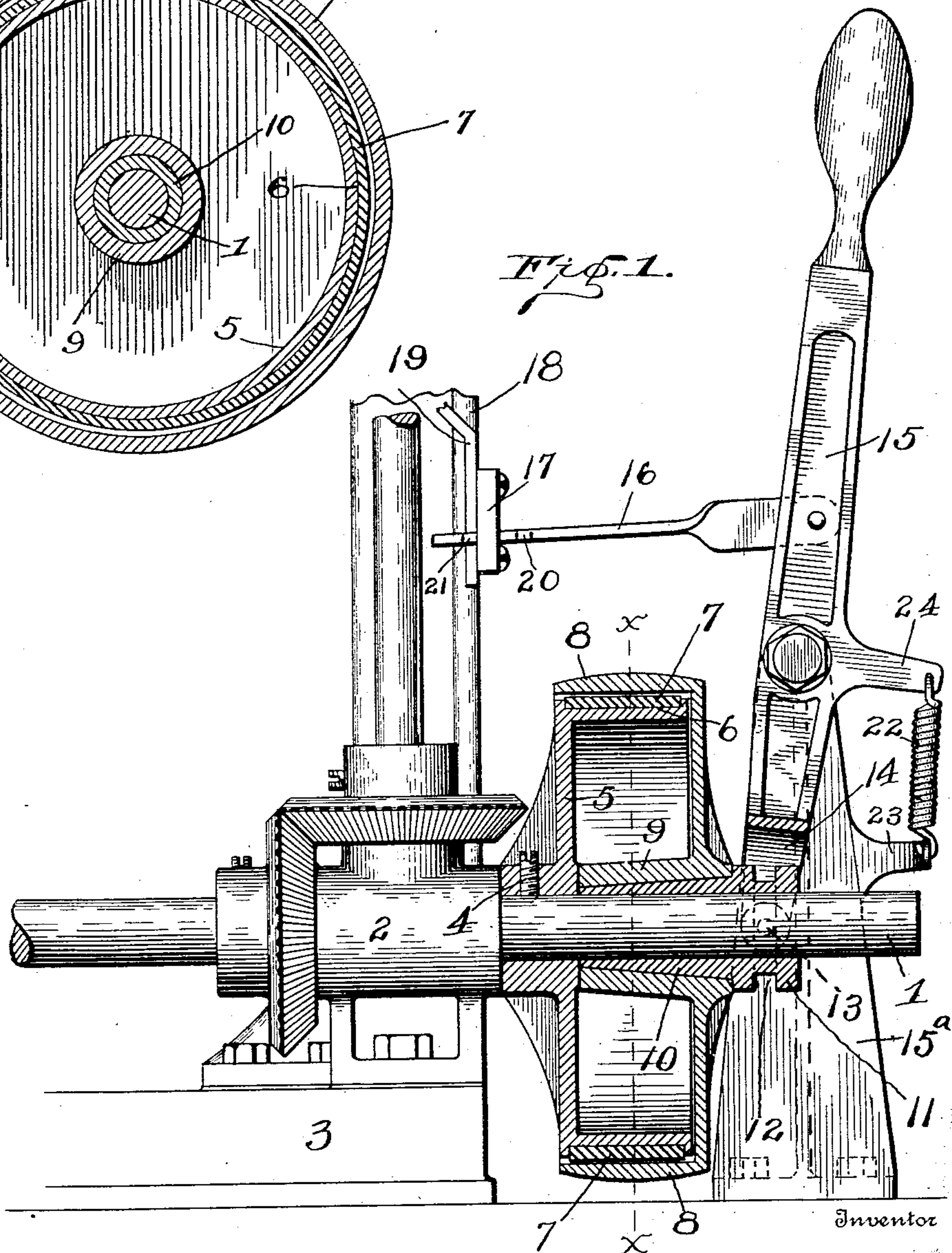


Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 4.

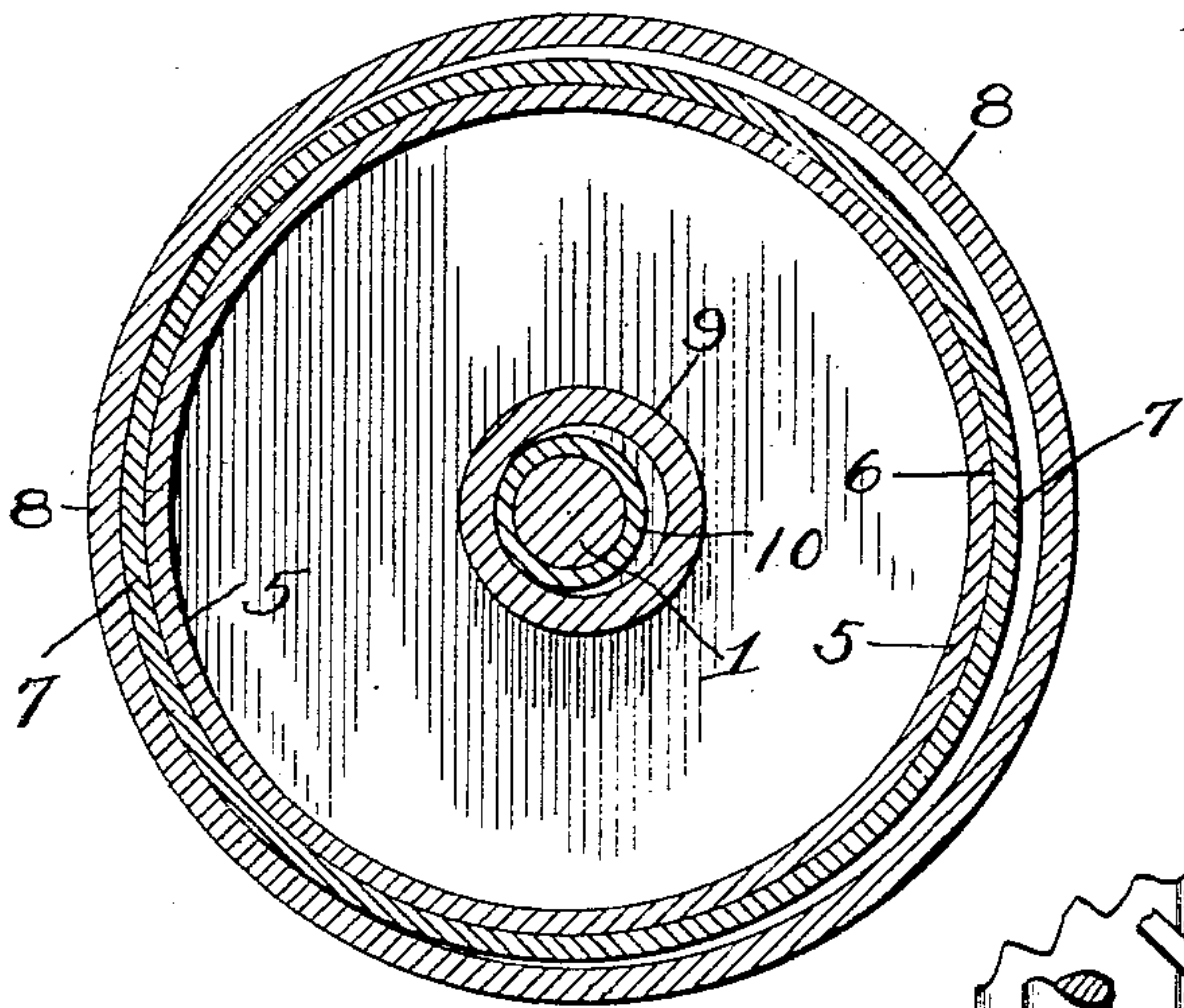
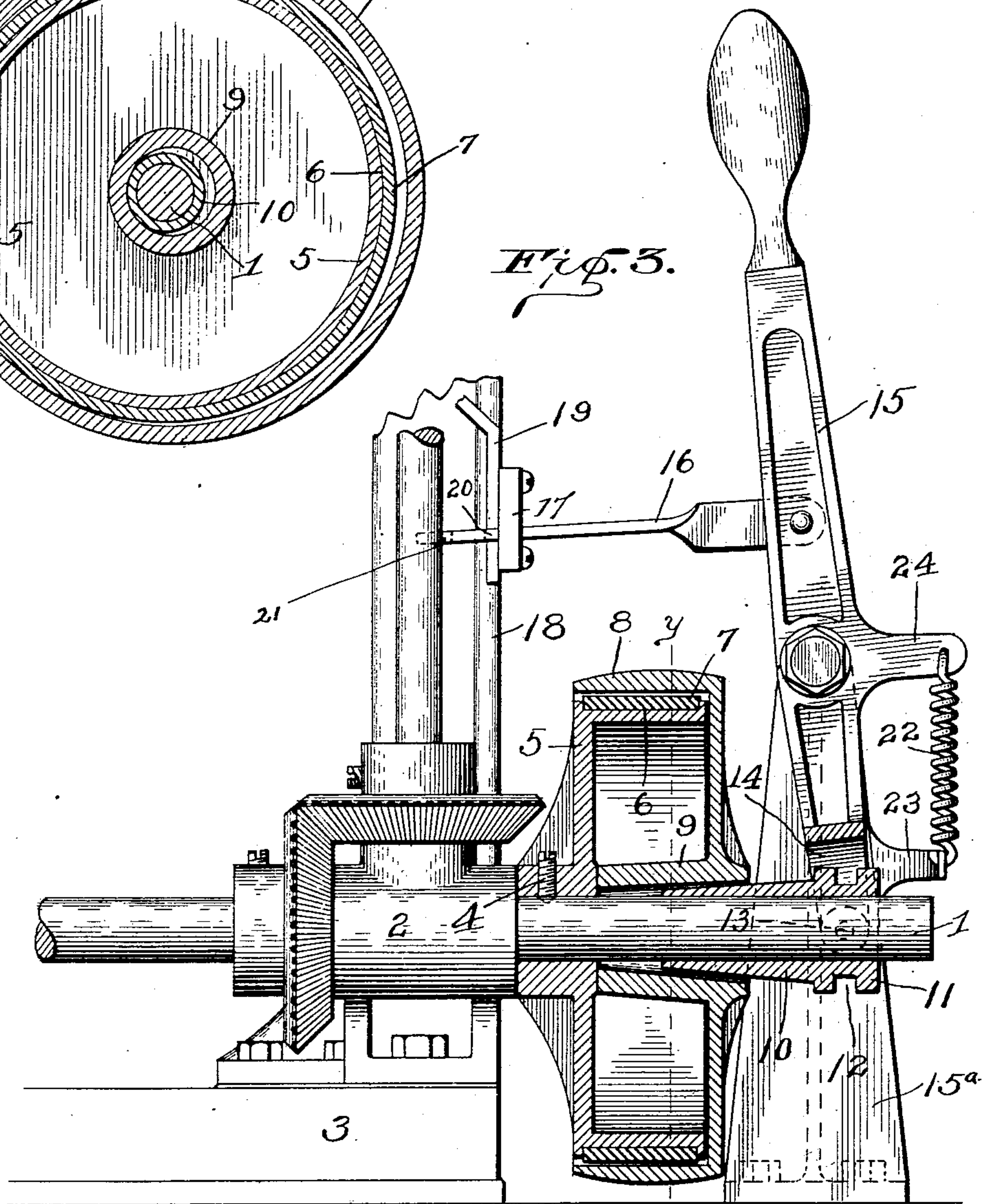


Fig. 3.



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UNITED STATES PATENT OFFICE.

JAKOB LUNDGREN, OF PHILADELPHIA, PENNSYLVANIA.

POWER-SHIFTER.

SPECIFICATION forming part of Letters Patent No. 751,740, dated February 9, 1904.

Application filed September 3, 1902. Renewed July 14, 1903. Serial No. 165,526. (No model.)

To all whom it may concern:

Be it known that I, JAKOB LUNDGREN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Power-Shifters; 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.

My invention has relation to power-shifting appliances, and the details of the preferred construction deemed necessary in illustrating a practical application of my idea to use will be clearly set forth in the following specification, and the essential features of my invention pointed out in the claims.

The object of my invention is to provide mechanism which though of extremely simple character will be found thoroughly reliable and efficient in its office of instantly connecting or disconnecting the driving mechanism or source of power to the machine or machinery to be driven thereby.

A further object of my invention is to so form and combine the cooperating parts required to accomplish the foregoing result that the simplest possible construction will be attained consistent with a maximum amount of service and absolute reliability.

Other objects and advantages will be hereinafter made apparent, reference being had to the accompanying drawings, in which—

Figure 1 is a central vertical sectional view of my power-shifting appliance, showing the relative position of the parts when the lever has been thrown to shift the power and stop the machine with which the appliance is connected. Fig. 2 is a sectional view thereof as indicated by the dotted line *x x* of Fig. 1. Fig. 3 is a central vertical sectional view of my power-shifting appliance, the parts being indicated in their relative positions when the power is applied to the driving-shaft. Fig. 4 is a central sectional view of Fig. 3, as indicated by the dotted line *y y*.

It may be briefly stated that my invention consists in providing and combining two pulley-wheels which are telescoped with each

other and connected with the driving-shaft in such a manner that when the driving-belt is applied to the outer pulley the inner pulley will be either wholly out of engagement with the outer belt-pulley or in frictional contact therewith, according to the position of another cooperating part, as will be hereinafter specifically set forth.

The essential feature of my invention, together with the cooperating accessories thereof, will for convenience be designated by numerals, the same numeral applying to a similar part in all the views.

Referring to the numerals on the drawings, 1 designates a suitable driving-shaft properly mounted in bearings 2, located upon and supported by the platform 3, while rigidly secured to the driving-shaft 1, as by a key or set-screw 4, as is common, is my friction or driving wheel 5, said wheel being preferably provided with a suitable annular seat 6 on its peripheral face adapted to receive a continuous band of any suitable pliable material, as leather, rubber belting, or the like, the object of said band being to provide a frictional or more or less yielding surface and at the same time obviate the liability of becoming heated. I also mount upon the shaft 1 the belt-pulley 8, so formed as to telescope with and loosely surround the wheel 5, together with its frictional belt 7. Said pulley 8 is provided with an inwardly-directed hub 9, having a conical seat or bore adapted to receive the conical or tapering sleeve 10, which is slidably mounted upon the shaft 1, and therefore adapted to be longitudinally moved upon said shaft into and out of engagement with the conical hub, thereby seating itself within said hub, so as to dispose the belt-pulley so that the peripheral face thereof will be truly concentric with the shaft and as a consequence hold said pulley entirely out of contact with the pulley 5. It is therefore obvious that when the conical sleeve 10 is forced home in the hub of the pulley-wheel 8 said pulley-wheel will simply rotate around the fixed pulley 5 and will permit said fixed pulley to remain idle. It will be further obvious that when the conical sleeve 10 is withdrawn from the hub there will be sufficient

play of the pulley 8, owing to the size of the bore of said hub, to cause the inner face of the pulley 8 to tightly engage the fixed pulley 5, and thereby frictionally induce its rotation and incidentally drive the mechanism with which the shaft 1 may be in connection. In order, therefore, to reliably place the movement of the conical sleeve under the control of the operator, I provide the outer or free end thereof with a circular head 11, having an annular groove or channel 12 therein, said groove being adapted to receive suitable lugs or a collar carried by the lower end 14 of the controlling-lever 15. Said lever 15 is suitably mounted in position, as upon the supporting-standard 15^a. When, therefore, it is desired to disconnect the driving mechanism or source of power with the shaft 1 and incidentally stop the machinery connected to said shaft, the lever 15 is moved to the right or to the position illustrated in Fig. 1 of the drawings, this action of the lever causing the conical sleeve 10 to be forced home within the seat provided in the hub 9, and thereby so disposing the belt-pulley 8 that it will be entirely out of contact with the peripheral face of the fixed pulley 5, and thus permit the machinery to come to a full stop, while at the same time the belt-pulley 8 will continue to revolve around the fixed pulley without in any wise affecting the same and in this way wholly disconnect the power.

By reference to Fig. 2 of the drawings it will be observed that a complete clearance or annular space is left between the frictional face of the fixed pulley and the inner face of the belt-pulley 8 when the latter is disposed concentric with the former, which disposition is readily accomplished by moving the lever 15 into the position shown in Fig. 1. Conversely, it may be stated that the power may be as quickly applied or reapplied by simply moving the lever 15 to the left, as shown in Fig. 3, which will cause the withdrawal of the conical sleeve 10 from its seat in the hub 9, and thereby leave the pulley-wheel 8 without a center upon which to revolve, and the result will be that the pulley 8 will be instantly forced in engagement with a contiguous part of the fixed pulley 5, and the frictional union thus set up between said parts will insure that the fixed wheel will be turned together with the shaft upon which it is keyed. The simple act, therefore, of moving the lever 15 to the right or left will disconnect or connect the source of power with the machinery to be driven at the will of the operator. By reference to Fig. 4 it will be observed that at certain parts there is a complete clearance between the fixed pulley 5 and the belt-pulley 8, while at other points said wheels are in close frictional contact with each other, thereby illustrating how the power is communicated from the outer to the inner wheel. The effect of withdrawing the conical sleeve will

be, it will therefore be observed, to leave the pulley 8 without any support except from the fixed pulley 5, thereby setting up an intimate union between said pulleys, as hereinbefore explained, the band of frictional material 7 tending to produce a great degree of friction, which will prevent the pulley 8 from slipping upon the fixed pulley. It is obvious, therefore, from the foregoing construction that the lever 15 may, if desired, be placed under automatic control of certain parts of the machinery, as by providing the bar 16, one end of which is pivotally secured to the lever 15, while the other end may be extended through a suitable guiding-bracket 17, carried by the standard or its equivalent 18, and it is obvious that the lever 15 may readily be locked in an inwardly-inclined position, so as to withdraw the conical sleeve 10 from its seat, as by the locking-bar 19 or the equivalent, so mounted that it will be adapted to play freely upward and downward and enter a recess or notch 20 in the bar 16. There is also another notch, 21, provided in said bar, so that the detent or locking-bar 19 may enter the same, when the lever 15 is thrown to the right, so as to lock said lever in position to hold the conical sleeve within the seat in the hub 9, and thereby throw the pulley 8 entirely out of engagement with the fixed pulley 5.

It will be observed that the lever 15 is normally held to the right by the spring 22, the lower end of which is connected to the bracket or lug 23, carried by the standard 15^a, while the upper end of the spring is attached to the arm 24, formed upon a contiguous part of the lever 15, said spring having sufficient power or tension to control the lever and throw it to the right when the detent 19 is disengaged from the recesses 20 or 21. The spring 22 is therefore designed to normally hold the mechanism out of gear, inasmuch as when the lever 15 is moved to the right the conical sleeve will be seated in the hub 9, and thereby dispose the pulley 8 wholly out of contact with the fixed pulley 5 and disconnect the machinery from the source of power.

I desire to comprehend such substantial equivalents and substitutes of the construction herein described as may be properly regarded as coming within the purview of my invention, and having thus fully described the construction and combination of parts involved in the materialization of my improved power connecting and disconnecting appliance further reference to the parts is dispensed with.

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

1. In a power-shifting appliance, the combination with the driving-shaft, of a member fixedly secured thereto; a member loose upon said shaft cooperating with said fixed member and means comprising a movable conical bear-

ing adapted to dispose the loose member into or out of engagement with said fixed member whereby the power applied to the loose member will be connected with or disconnected from the fixed member, substantially as specified and for the purpose set forth.

2. The herein-described power-shifter comprising the combination with a driving-shaft, of a driving-wheel fixedly secured thereto; a pulley-wheel having one side removed and adapted to receive the fixed wheel and suitable means carried by said shaft and cooperating with the pulley-wheel adapted to center the pulley-wheel upon the shaft whereby it will be wholly out of contact with the fixed wheel or leave said pulley-wheel without a central support thereby causing its overlapping flange to engage the fixed wheel and drive the same as and for the purpose set forth.

3. In a power-shifting appliance, and friction-clutch of the character specified, the combination with a driving-shaft, of a hollow wheel fixedly secured thereto and having one side wholly removed; a pulley-wheel adapted to telescope said fixed wheel and having an inwardly-directed hub 9 provided with a conical seat; a sleeve 10 having a conical face longitudinally movable on said shaft and means to drive said sleeve within the hub of the pulley-wheel or withdraw it therefrom whereby said pulley-wheel will be truly centered upon the shaft and held out of contact with the fixed wheel or left without a central support to rest upon or frictionally engage the fixed wheel and thereby drive the same, all substantially as specified and for the purpose set forth.

4. The herein-described friction-clutch or power-shifter comprising the driving-shaft 1, the wheel 5 fixedly secured to said shaft and having a continuous radial flange or lip, in combination with a pulley-wheel 8 adapted to telescope the fixed wheel and having a hub provided with a conical seat and a sleeve adapted to fit said seat and means to move the sleeve in or out of the seat as and for the purpose set forth.

5. A friction-clutch or power-shifter comprising the fixed wheel 5 having a continuous flange and a continuous piece of frictional material seated in the face of said flange, in combination with a pulley-wheel 8 adapted to tele-

scope said fixed wheel and suitable means to center the pulley-wheel upon the shaft whereby it will be wholly out of contact with the fixed wheel or leave said wheel wholly without a central support and thereby dispose it in frictional engagement with the fixed wheel as and for the purpose set forth.

6. In a power-shifting appliance, a driving-shaft; a pulley fixedly secured thereto, in combination with a pulley loose on said shaft and having a flange extending over the periphery of said fixed pulley and means to remove the bearing support of the loose pulley whereby the loose pulley will contact the periphery of the fixed pulley and rotate the same substantially as and for the purpose set forth.

7. The herein-described power connecting and disconnecting appliance, consisting of a driving-shaft, a fixed wheel 5 securely keyed thereto; a belt-driven wheel adapted to telescope said fixed wheel and having a hub provided with a conical seat; a sleeve 10 slidingly mounted upon said shaft and having an outwardly-extending head provided with an annular groove, and a lever operatively connected to said head through the mediation of said groove whereby an inward or outward movement of the lever will cause said sleeve to be withdrawn from or driven into its seat in said hub and means to hold said lever normally outward, all substantially as specified and for the purpose set forth.

8. In a power-shifter, a driving-shaft; a wheel secured rigidly thereto; a belt-driven wheel adapted to engage the fixed wheel and means to entirely withdraw and restore at will the central support or bearing of the belt-driven wheel whereby when said central support is withdrawn the belt-driven wheel will engage the fixed wheel and when said bearing is restored the belt-driven wheel will stand wholly out of contact with the fixed wheel and rotate freely upon its central support as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JAKOB LUNDGREN.

Witnesses:

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J. DANIEL EBY.