

No. 652,546.

Patented June 26, 1900.

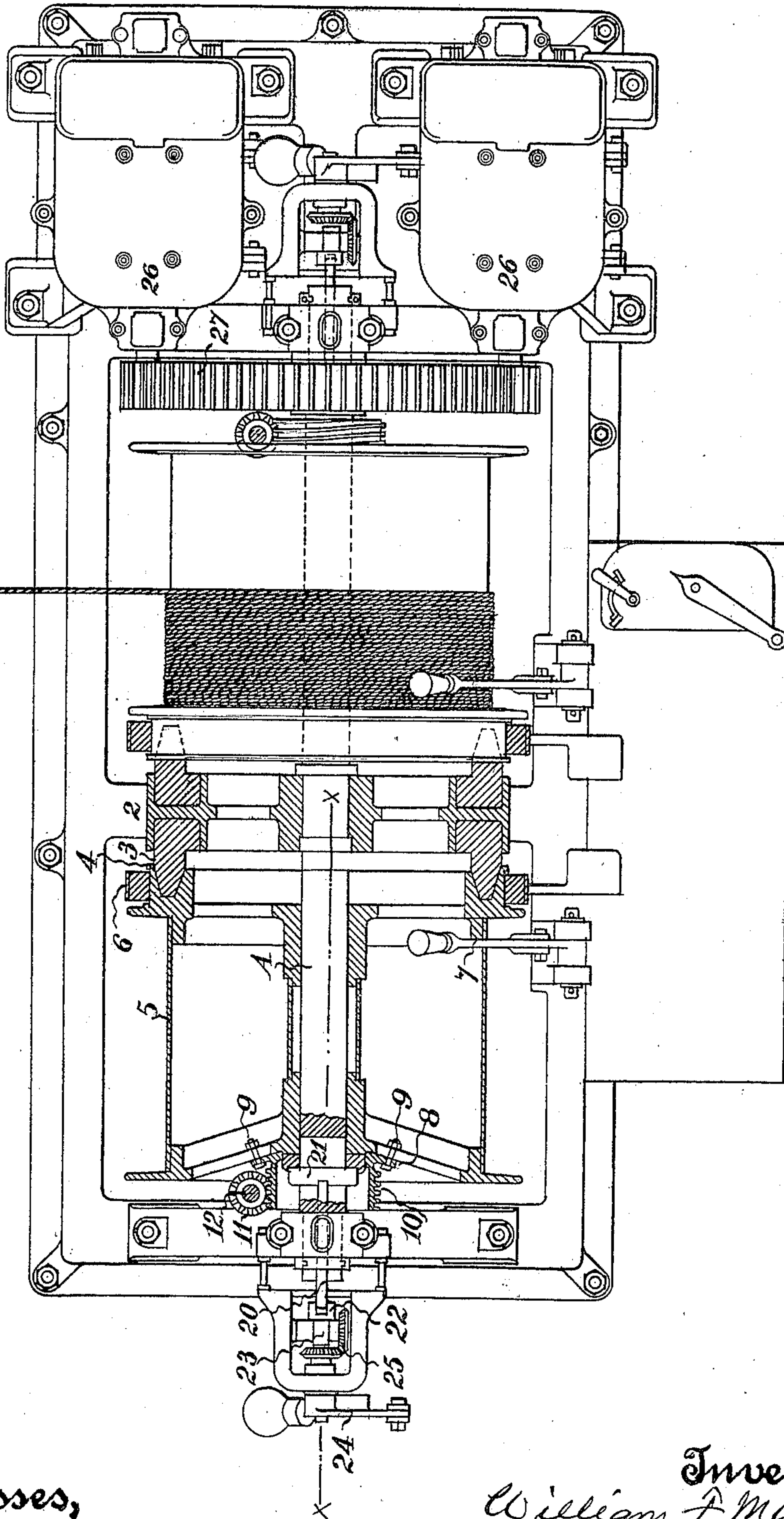
W. F. MURRAY.
WINDING DRUM INDICATOR.

(Application filed Mar. 5, 1900.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



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Fig. 2.

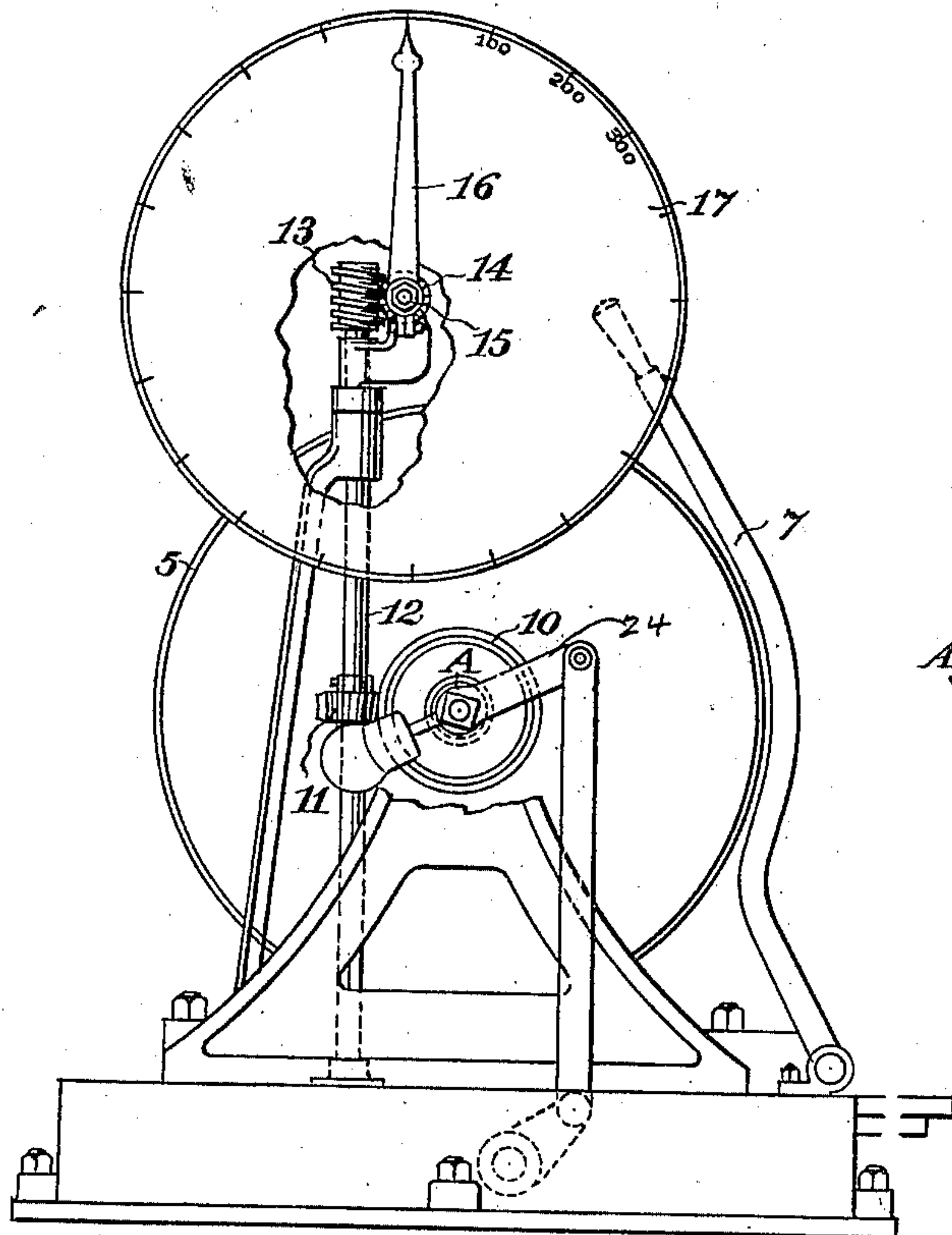
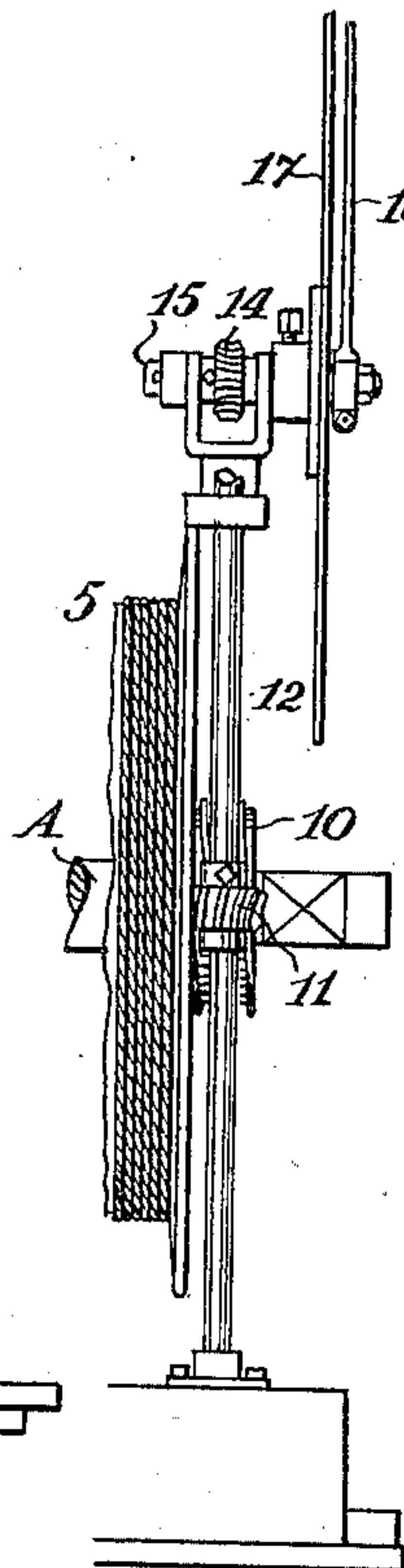


Fig. 3.



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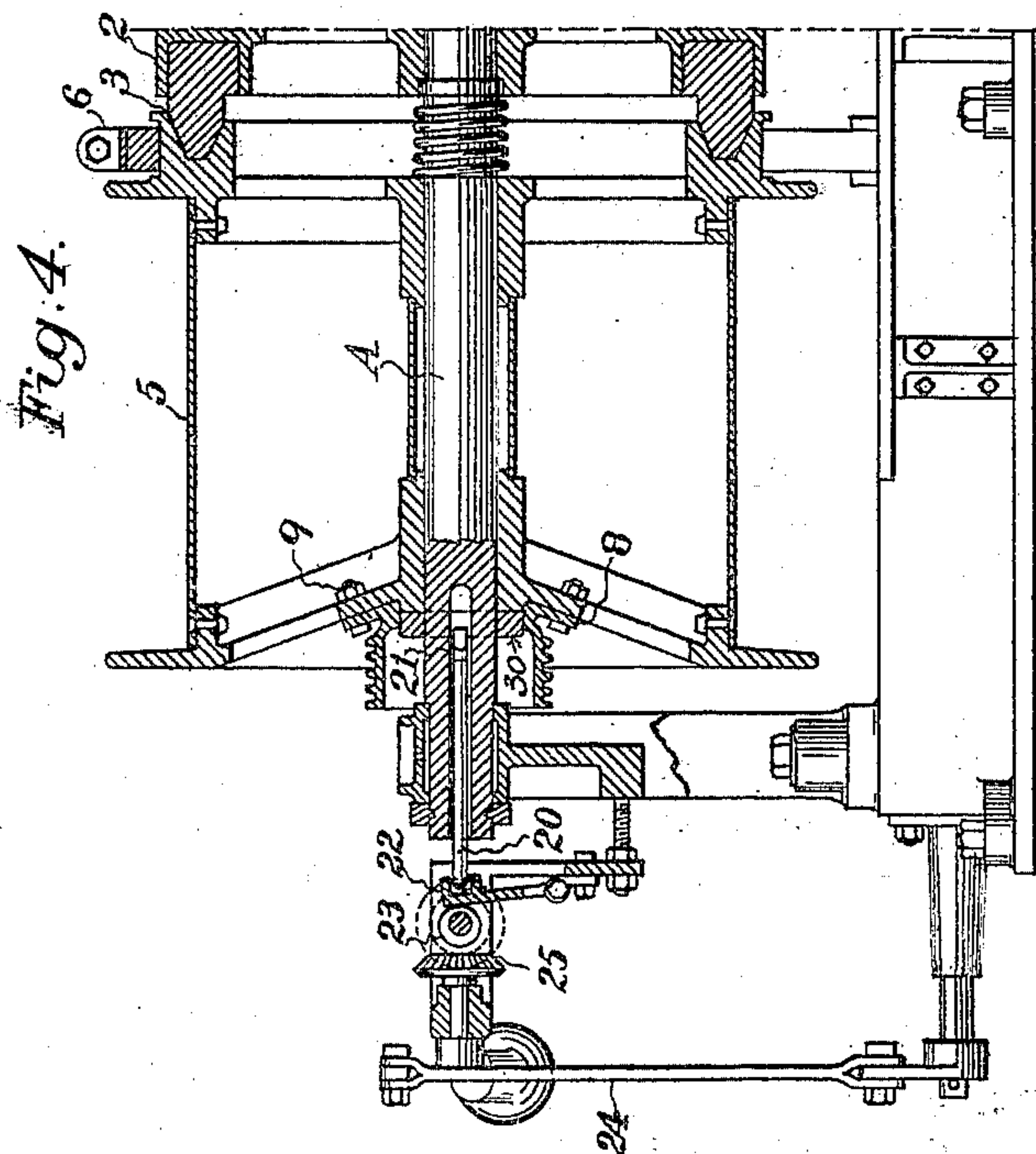
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

WILLIAM F. MURRAY, OF SAN FRANCISCO, CALIFORNIA.

WINDING-DRUM INDICATOR.

SPECIFICATION forming part of Letters Patent No. 652,546, dated June 26, 1900.

Application filed March 5, 1900. Serial No. 7,320. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. MURRAY, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Winding-Drum Indicators; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a means for applying an indicator to winding-drums of that class in which the drum is turnable upon a shaft and to which power is applied from the shaft by means of a friction-clutch.

It consists in devices connected and operated directly from the drum upon which the rope is coiled in hoisting apparatus, so that the amount of rope wound upon or unwound from the drum will be accurately indicated independent of any slippage or lack of unity of action between the drum and its driver.

Referring to the accompanying drawings, Figure 1 is a partial plan and section. Fig. 2 is an end elevation. Fig. 3 is a portion at right angles to the same. Fig. 4 is a vertical sectional view, partially in elevation, on the line *x x* of Fig. 1.

In the use of winding-drums, especially where ropes or cables coiled thereon are used for hoisting in deep mining and other shafts, it is necessary that the engineer or operator should know accurately at all times how much rope has been paid out or wound in order to know exactly where the cage may be. Thus in deep mines, ranging to as much as two thousand feet, with levels or drifts at various intermediate distances, as fifty or one hundred feet apart, when the cage is lowered there must be some means of showing to the operator on the surface when the cage has reached the particular level which it is desired to connect it with. This is effected by indicators of various descriptions, and where the winding-drum is fixed upon the shaft through which power is applied these indicators are connected directly with the shaft. In my invention I have shown an apparatus in which the drum or drums revolve loosely upon the shaft and are provided with means by which they can be thrown into sufficient frictional contact with a pulley or carrier which is fixed to a shaft so that power will be transmitted to rotate the drum, and by

relieving this frictional contact the drum may be allowed to revolve independently of the shaft for the purpose of lowering the cage. Under such conditions it is not possible to connect the indicating mechanism with the shaft, and it is the object of my invention to provide such connections directly with the drum as will insure an accurate indication of the amount of rope which has been uncoiled from the drum and the exact position of the cage in the shaft.

As shown in the present drawings, A is the shaft to which power is transmitted from any suitable motor, and 2 is a wheel or driver fixed upon the shaft and revoluble with it. This wheel or driver has the frictional rings or equivalent devices 3 projecting from one side near the periphery and adapted to engage with or be disengaged from a corresponding engaging portion 4 of the winding-drum. This drum is loosely turnable upon the shaft A, and by suitable mechanism operating in line with the shaft the frictional surfaces may be forced into contact with such pressure that a sufficient power would be communicated to rotate the drum. By relieving this pressure the drum may be allowed to turn independently of the shaft without stopping the motion of the latter, and the cage can thus be lowered.

Any suitable brake mechanism may be employed to control the movement of the drum. A very suitable form is a strap-brake 6, with an actuating-lever 7, by which the pressure of the strap may be increased or relieved to allow the drum to rotate as rapidly as may be desired; but these details may be changed to suit the conditions and location of the apparatus.

8 is a plate or disk having suitable lugs and bolt-holes, as at 9, this disk being centrally perforated to fit over the hub and central portions of the drum, and the plate or disk 8 is bolted upon the end of the drum. These parts may also be formed with or otherwise attached to the drum. This plate or disk has a cylindrical sleeve projecting outwardly from it and carrying the threads 10 of a worm-gear, and this worm engages with the teeth of a corresponding gear-wheel 11, mounted upon a shaft 12, so that motion transmitted from the drum will rotate the shaft 12. Upon this shaft 12 is

fixed a worm or screw 13, which engages with a gear 14 upon the shaft 15, which carries the indicator arm or pointer 16. This arm or pointer is so arranged that its outer end moves
 5 over a dial 17, which is divided into spaces, so as to indicate each hundred feet or fraction thereof through which the cage may be passing. Thus any movement of the cage corresponding with the winding or unwinding of the rope
 10 will be accurately shown upon the indicator-dial, and it will be possible to know exactly where the cage is at all times. By thus connecting the indicating mechanism directly with the drum all danger of error by reason
 15 of the slippage of the frictional devices 3 4 or their equivalents will be obviated.

In the present case I have described the mechanism by which the indicator arm or pointer is driven as comprising worm-gears
 20 and corresponding screw-threads through which the power is transmitted; but it will be manifest that this transmission may be also effected by the use of bevel-gears of proper proportions so disposed as to provide for the
 25 necessary change of direction between the drum and the indicator, and I do not desire to limit myself to either of these or any equivalent construction.

The mechanism by which the frictional surfaces of the drum and the driver 2 are engaged or disengaged, as shown in Fig. 4, consists of a pin 20, slidable in the end of the shaft A and having a plate or plates 21 on the inner end, which plate extends outwardly
 30 through slots in the shaft, so that the ends of the plate may press against a collar 30 on the end of the hub of the drum, which collar provides an annular frictional surface of contact between itself and the drum and reduces
 35 the wear upon the latter. The outer end of the pin fits into a box or step 22, so that it is freely turnable with the shaft. This box and the pin are guided and are moved by a cam or eccentric 23, which is journaled so as to
 40 be turned by a lever 24, disposed in any convenient manner within reach of the operator. As here shown, the lever acts upon the cam through a bevel-gear 25. It will be understood that the driver 2 may be a belt-pulley,

as shown, a gear, or other suitable device. 50
 Power is applied to the shaft A from any suitable or convenient motor, as 26, through gearing or equivalent connections 27.

Having thus described my invention, what I claim as new, and desire to secure by Letters 55
 Patent, is—

1. The combination of a drum, a shaft upon which it is loosely mounted, a driver carried by the shaft, means whereby the drum is moved endwise into and out of engagement 60
 with the driver, a gear concentric with the axis of the drum and rigid with said drum, an indicator and a dial over which it operates, and means for transmitting the motion of the gear to the indicator. 65

2. A driving-shaft, a drum loosely revoluble thereon, a frictional device, one member of which is fixed to and revoluble with the shaft, and the other member is carried by the drum, mechanism for engaging and disengag- 70
 ing the clutch devices, a transmitting-gear, one member of which is concentric with the axis of the drum and is fixed to and revoluble with said drum, and the other member engaging therewith and adapted to transmit 75
 motion to an indicator-arm, and a spaced dial over which said indicator is movable in unison with the movements of the drum.

3. A driving-shaft, a drum loosely revoluble thereon, a frictional device, one member 80
 of which is fixed to and revoluble with the shaft, and the other member is turnable in unison with the drum, a spaced dial, an indicator-arm movable with relation to said dial and connections whereby the indicator 85
 is movable in unison with the drum, a pin movable axially to the driving-shaft, having arms adapted to contact with the drum and means including a lever and connections between the same and the pin, whereby the 90
 drum is movable to engage or disengage the clutch or frictional devices.

In witness whereof I have hereunto set my hand.

WILLIAM F. MURRAY.

Witnesses:

JAMES L. KING,

JOHN A. YOUNG.