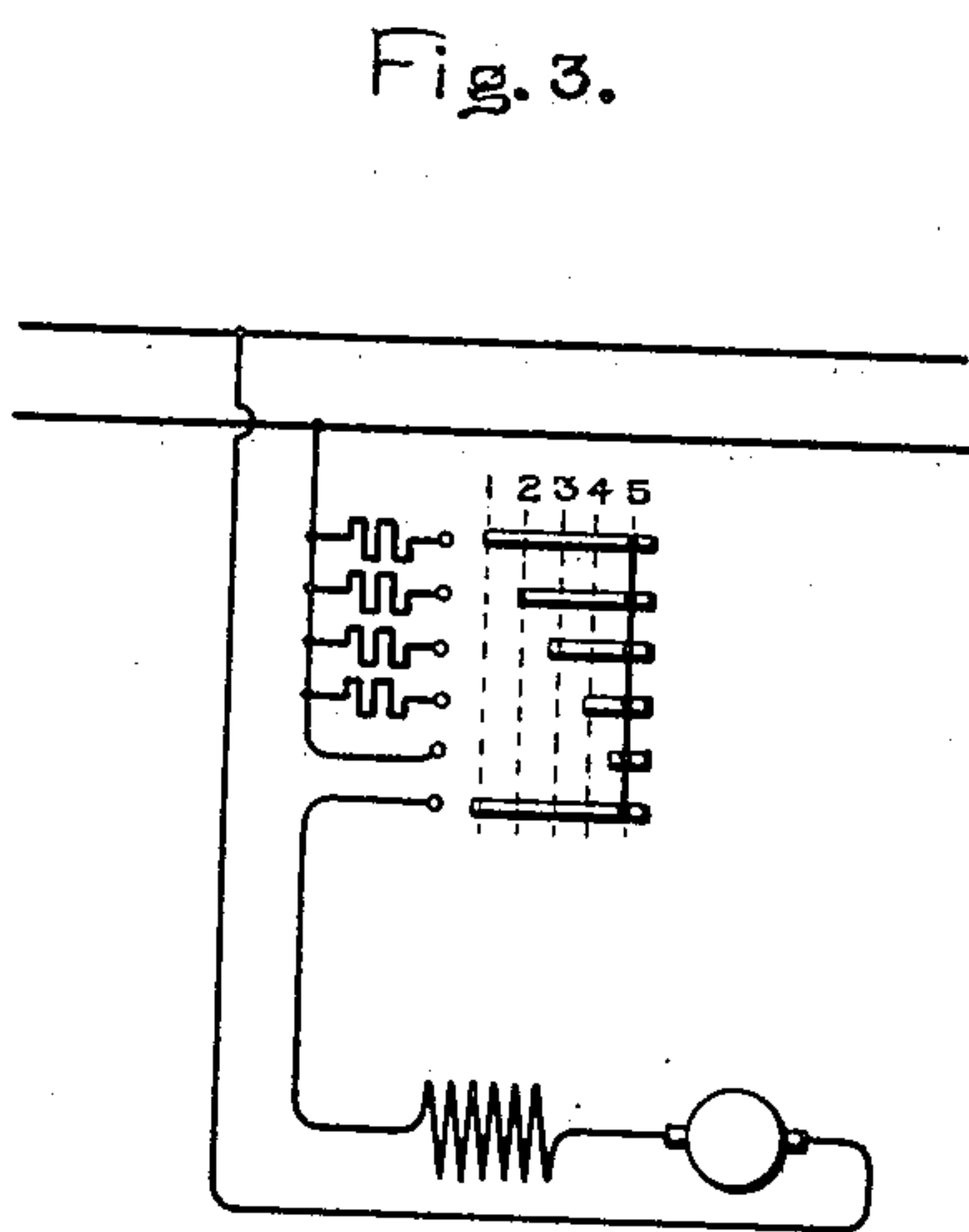
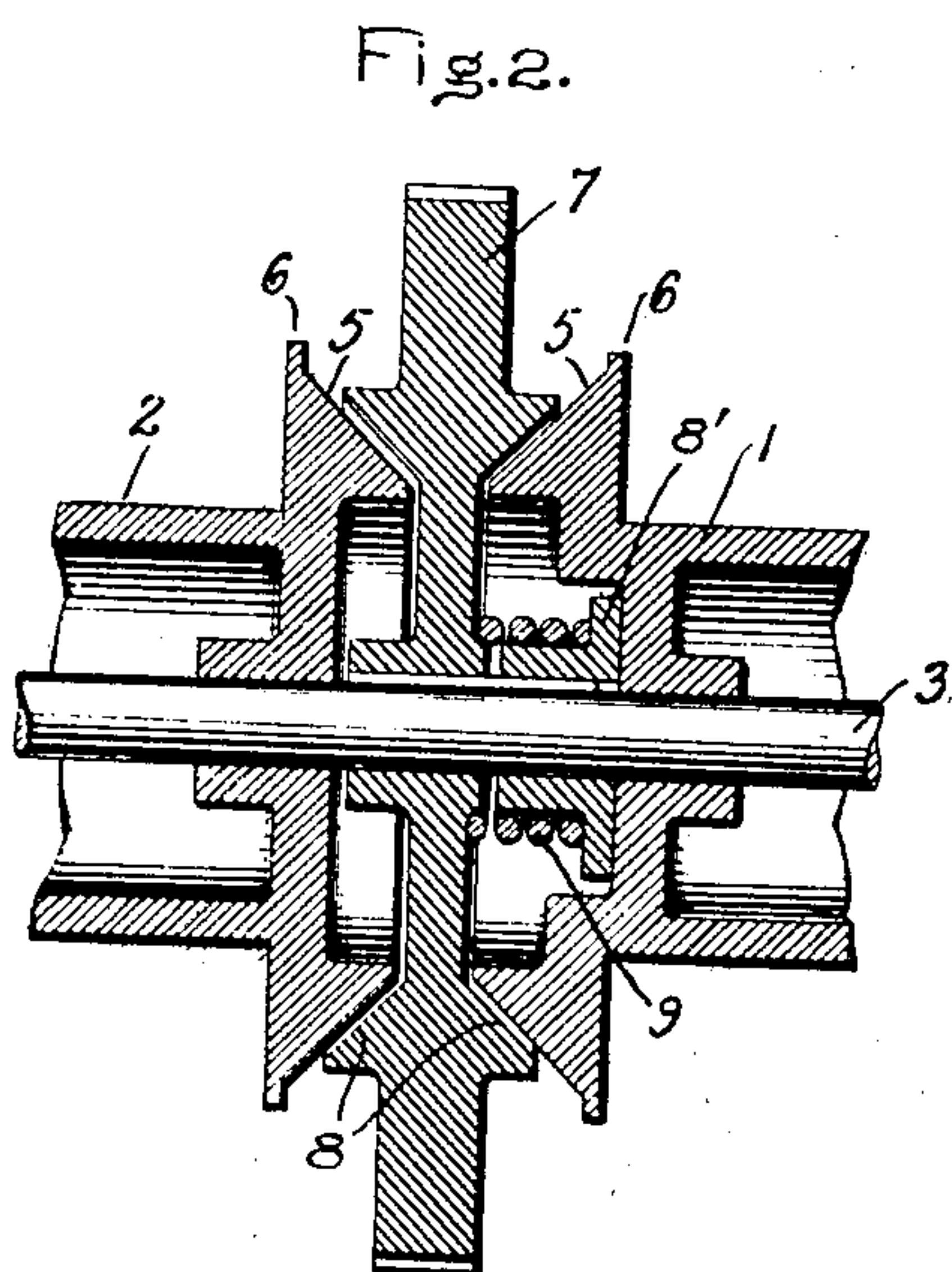
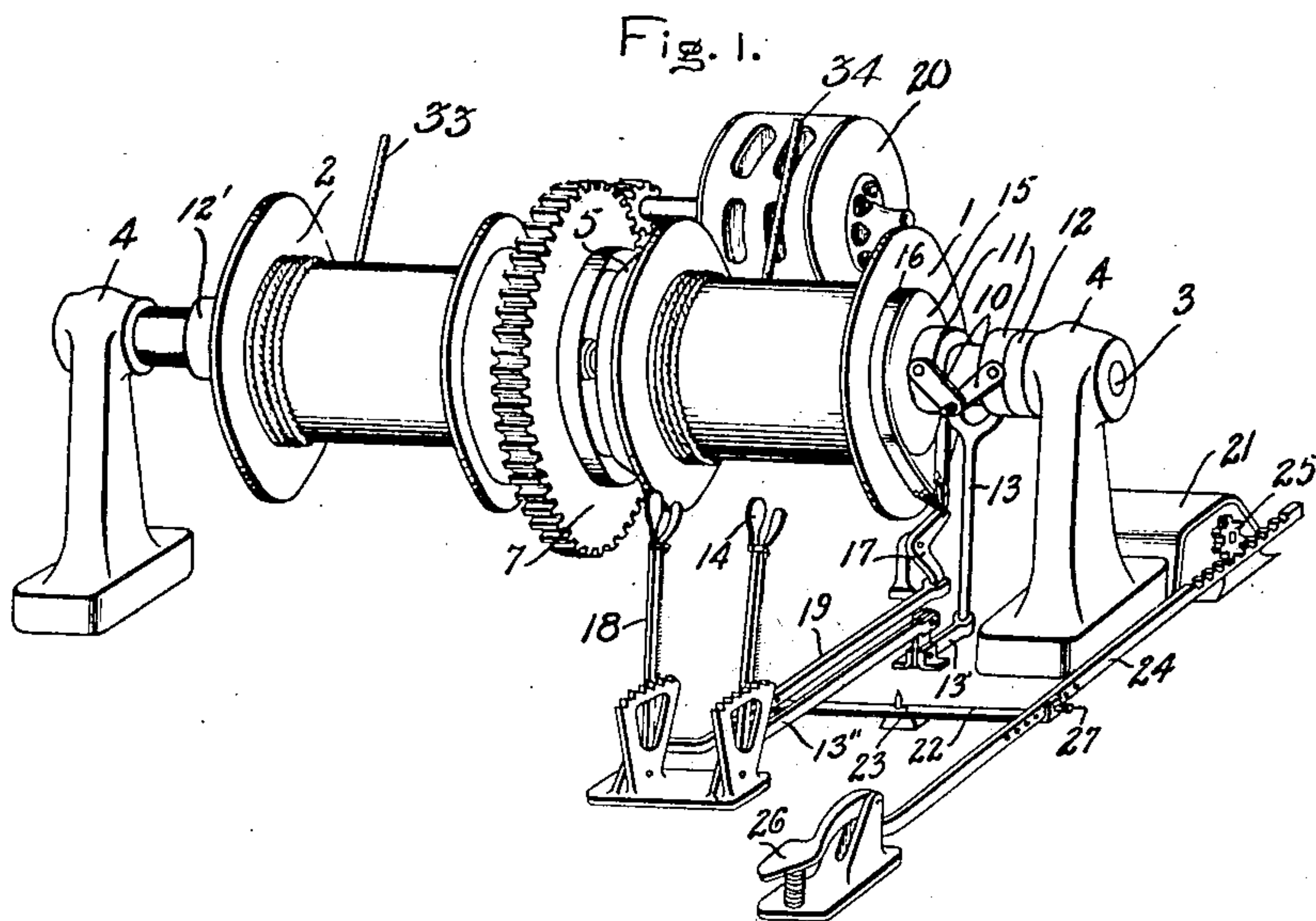


No. 816,372.

PATENTED MAR. 27, 1906.

W. B. POTTER.
HOISTING APPARATUS.
APPLICATION FILED AUG. 1, 1904.

2 SHEETS—SHEET 1.



Witnesses

George A. Thornton,
Allen Oxford

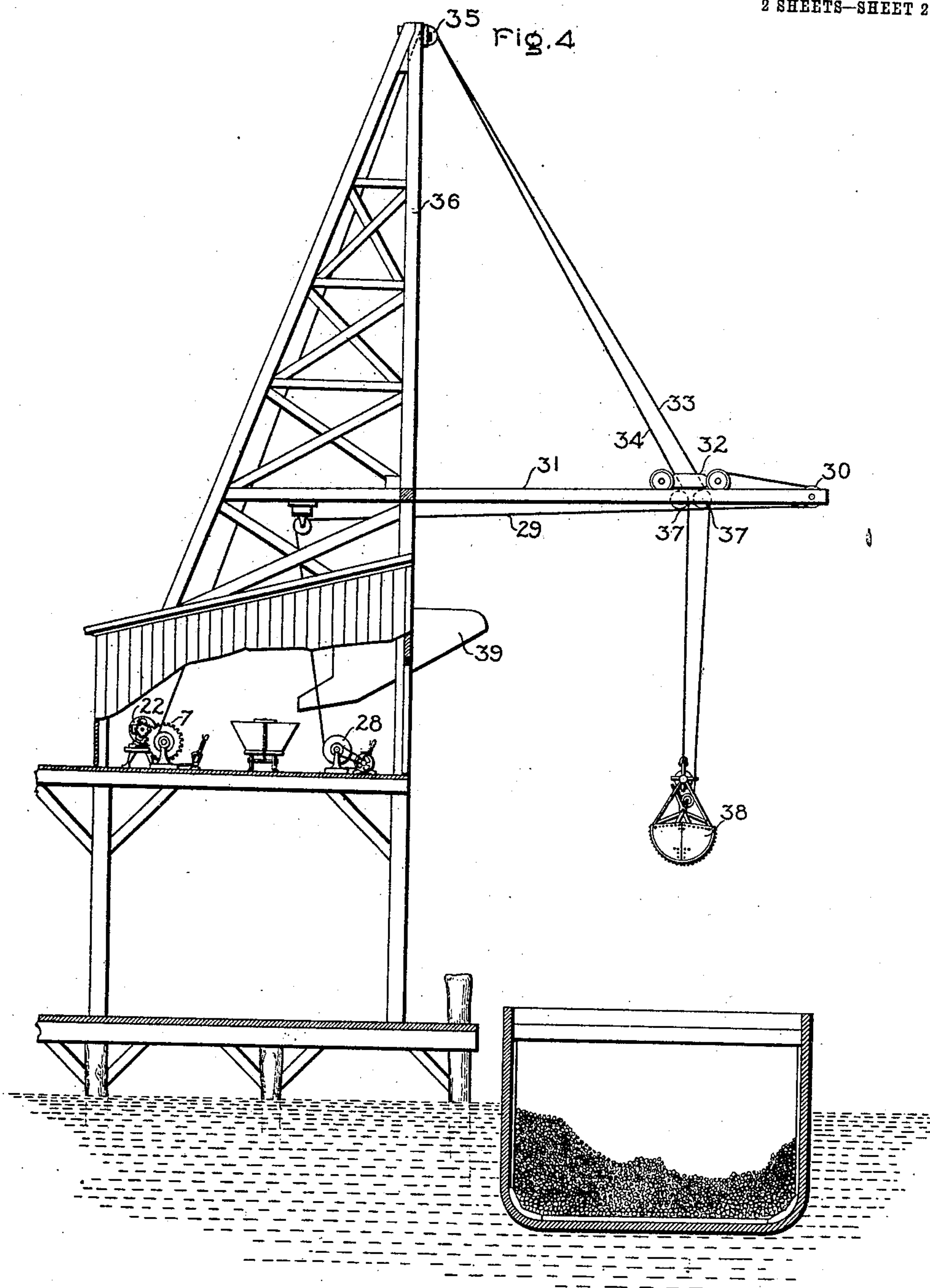
Inventor:
William B. Potter,
by *Albert S. Davis*
Att'y.

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2 SHEETS—SHEET 2.



WITNESSES :

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UNITED STATES PATENT OFFICE.

WILLIAM B. POTTER, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

HOISTING APPARATUS.

No. 816,372.

Specification of Letters Patent.

Patented March 27, 1906.

Application filed August 1, 1904. Serial No. 218,989.

To all whom it may concern:

Be it known that I, WILLIAM B. POTTER, a citizen of the United States, residing at Schenectady, in the county of Schenectady and State of New York, have invented certain new and useful Improvements in Hoisting Apparatus, of which the following is a specification.

My invention relates to hoisting apparatus, and more especially to the type of hoisting apparatus employed in connection with the automatic or clam-shell bucket extensively used in discharging coal, ore, and similar substances.

As hoisting apparatus has been built heretofore it has been necessary either to reverse the driving mechanism a number of times during each operation or employ so many manually-operated parts that regulation of the driving means was impracticable, and as a consequence electric motors when used as a driving means have not proven so economical as in other places where they were not subjected to sudden and frequent reversals and were properly regulated.

The object of the present invention is to provide a hoisting apparatus having its parts so constructed and arranged that it may be propelled by a unidirectional driving means and its several operations and its speed readily and simultaneously controlled and regulated by a single operator.

In carrying out my invention I provide separate drums for the hoisting and operating cables, means controlled by a single manually-operated part for causing one or both of the drums to engage or disengage the driving mechanism, and means for braking one of the drums controlled by a second manually-operated part. The speed of the motor is regulated either simultaneously with the braking action by means of a direct connection with the brake-lever or independently by means of a foot-lever.

The invention will be more readily understood by reference to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a perspective view of a hoisting apparatus embodying one form of my invention. Fig. 2 is a longitudinal section through

the main friction-gear and adjacent ends of the cable-drums. Fig. 3 is a diagrammatic representation of the electrical connections of the motor, and Fig. 4 shows my hoisting device installed in an ordinary coal-pier.

The device shown in the drawings comprises the main hoisting-drum 1 and the operating-drum 2, mounted loosely upon a common shaft 3, carried in bearings 4. The drums 1 and 2 are each provided at one end with friction-surfaces 5 in the shape of a frustrated cone projecting from the flanged head 6. Loosely feathered to the shaft 3 between the opposed friction-surfaces 5 of the drums 1 and 2 is the friction-gear 7, having friction-surfaces 8 on its opposite sides adapted to cooperate with the surfaces 5. Between the end of the hoisting-drum 1 and the gear 7 is a shouldered sleeve 8', also feathered to the shaft 3, and surrounded by a helical spring 9, engaging the side of the gear and the shoulder of the sleeve and acting to normally hold the hoisting-drum 1 pressed away from the gear 7, so that when the drum 1 is forced axially toward the gear 7 the spring 9 acts at first to force the gear along the shaft into engagement with the operating-drum 2 and then upon further travel of the hoisting-drum it yields to permit the drum 1 and the gear 7 to frictionally engage.

The means for moving the hoisting-drum 1 toward the gear 7 consists of toggle-levers 10 10, pivoted to collars 11 11, mounted loosely on the shaft 3 between the end of the hoisting-drum 1 and a collar 12, fixed to the shaft, the operating-drum 2 being held from longitudinal movement by a corresponding fixed collar 12', and the toggle-levers 10 10 are connected at their common joint with a yoked link 13, which connects at its lower end with one arm of a bell-crank 13', which is connected by its other arm to a connecting-rod 13'', engaging a hand-lever 14, provided with a rack and detent.

The means for frictionally braking the hoisting-drum 1 when the bucket is in raised position and for controlling the lowering thereof consists of a collar 15, projecting from the outer end of the hoisting-drum 1 and surrounded by a brake-strap 16, connected to a bell-crank 17, actuated by a sec-

ond hand-lever 18 through a connecting-rod 19.

The main driving-gear 7 is rotated by means of a unidirectional motor 20, geared thereto, and controlled by a rheostat 21, having a simple series of graduated resistances, as indicated in Fig. 3. The rheostat is connected to be operated simultaneously with the braking operation by means of a lever 22, pivoted at 23, and jointed at one end to the connecting-rod 19 of the brake, and at the other end to a rack-rod 24, engaging a pinion 25 on the movable member of the rheostat. A foot-lever 26 is provided for independent control of the rheostat, the lever 22 being disconnected at such times from the rack-rod 24 by removal of the bolt 27.

When the device above described is installed in a coal-pier, as indicated in Fig. 4, an independent mechanism 28 is employed for running in and out of the bucket, consisting of a single drum operating upon a cable 29, which passes to a sheave 30 at the end of a boom-runner 32 in the usual manner. The bucket-operating cable 33 and the hoisting-cable 34 pass from their respective drums 2 and 1 to a sheave 35 at the top of the mast 36 down over sheaves 37, carried by the boom-runner 32 to the buckets 38.

The operation is substantially as follows: Assuming the bucket to be open and resting upon the coal in the barge, the motor is excited by throwing brake-lever 18 forward or by pressing upon the foot-lever 26, when lever 22 is disconnected, and friction-gear 7 being geared to the motor is at once set in motion. Lever 14 is then drawn back part way to bring the gear 7 into engagement with the operating-drum 2, which is thereby rotated to take up sufficient length of cable 33 to close the bucket 38. Then the lever 14 is drawn back still farther, causing the hoisting-drum 1 to overcome the tension of the spring 9 and engage gear 7. Thereupon both drums are caused to rotate in unison to hoist the bucket until it is raised to the desired height. The lever 18 is then drawn back to brake the hoisting-drum 1 and shut off the current from the motor, the running-out drum 28 having meanwhile been released to permit the bucket to travel into position above the hoppers 39, whereupon the lever 14 is moved forward to release the operating and hoisting drums 2 and 1 from the friction-gear 7, the bucket being sustained by means of the brake 16, while the operating-drum being freed rotates in a reverse direction, permitting the bucket 38 to open and discharge into the hopper 39. The running-out drum 28 is again actuated to draw the bucket out to position over the barge, where it is permitted to descend under control of the friction-brake 16.

It is to be noted that the operations of raising, discharging, lowering, and closing the bucket are entirely controlled by two levers 14 and 18 and the power of the unidirectional motor also regulated simultaneously therewith or, when desired, by a third lever 26, so that a single operation may control these several operations without releasing any one lever in order to manipulate another.

While I have shown and described my invention as applied to a particular kind of hoisting apparatus, it is apparent that it is in no way restricted thereto nor to the devices shown and described herein.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination of two drums, means for driving said drums, and means controlled by a single lever for causing one or both of said drums to engage said driving means.

2. The combination of two drums, friction means for driving said drums, and means controlled by a single lever for causing one or both of said drums to frictionally engage said driving means.

3. The combination of two drums, friction means for driving said drums, means normally operating to hold one of said drums out of contact with said driving means, and a single means adapted to force one or both of said drums into engagement with said driving means.

4. The combination of a hoisting-drum and an operating-drum, friction means for driving both of said drums, means normally acting to hold said hoisting-drum out of contact with said driving means, and a single means adapted on part movement to force the operating-drum into engagement with the driving means and upon further movement to force both drums into engagement with said driving means.

5. The combination of a shaft supported at its ends, two drums mounted on said shaft and provided with friction-surfaces at their adjacent ends, a wheel provided with corresponding friction-surfaces loosely feathered on said shaft between said drums, a spring located between said wheel and one of said drums to normally hold said wheel out of contact therewith and in contact with the other drum, and a thrust device for moving said spring-pressed drum into engagement with said wheel.

6. The combination of two drums, means for driving said drums, means controlled by a single lever for causing one or both of said drums to engage said driving means, and a brake device for one of said drums.

7. The combination of a hoisting-drum and an operating-drum, means for driving said drums, means normally operating to hold the hoisting-drum out of contact with its

driving means, means operated by a single lever adapted upon part movement to force the operating-drum into engagement with said driving means and upon further movement to force the hoisting-drum into engagement with said driving means, and a brake device engaging said hoisting-drum.

In witness whereof I have hereunto set my hand this 29th day of July, 1904.

WILLIAM B. POTTER.

Witnesses:

BENJAMIN B. HULL,
HELEN ORFORD.