

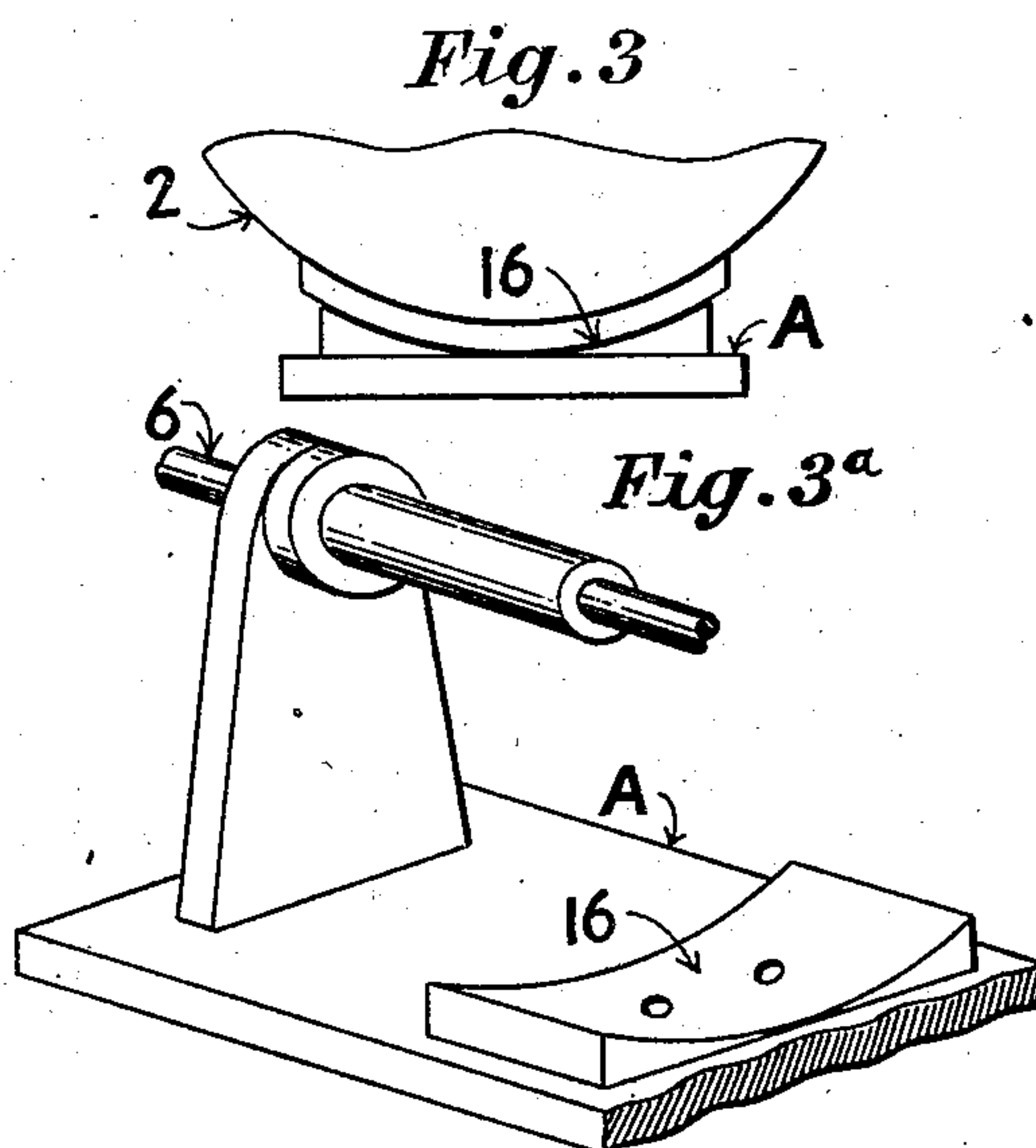
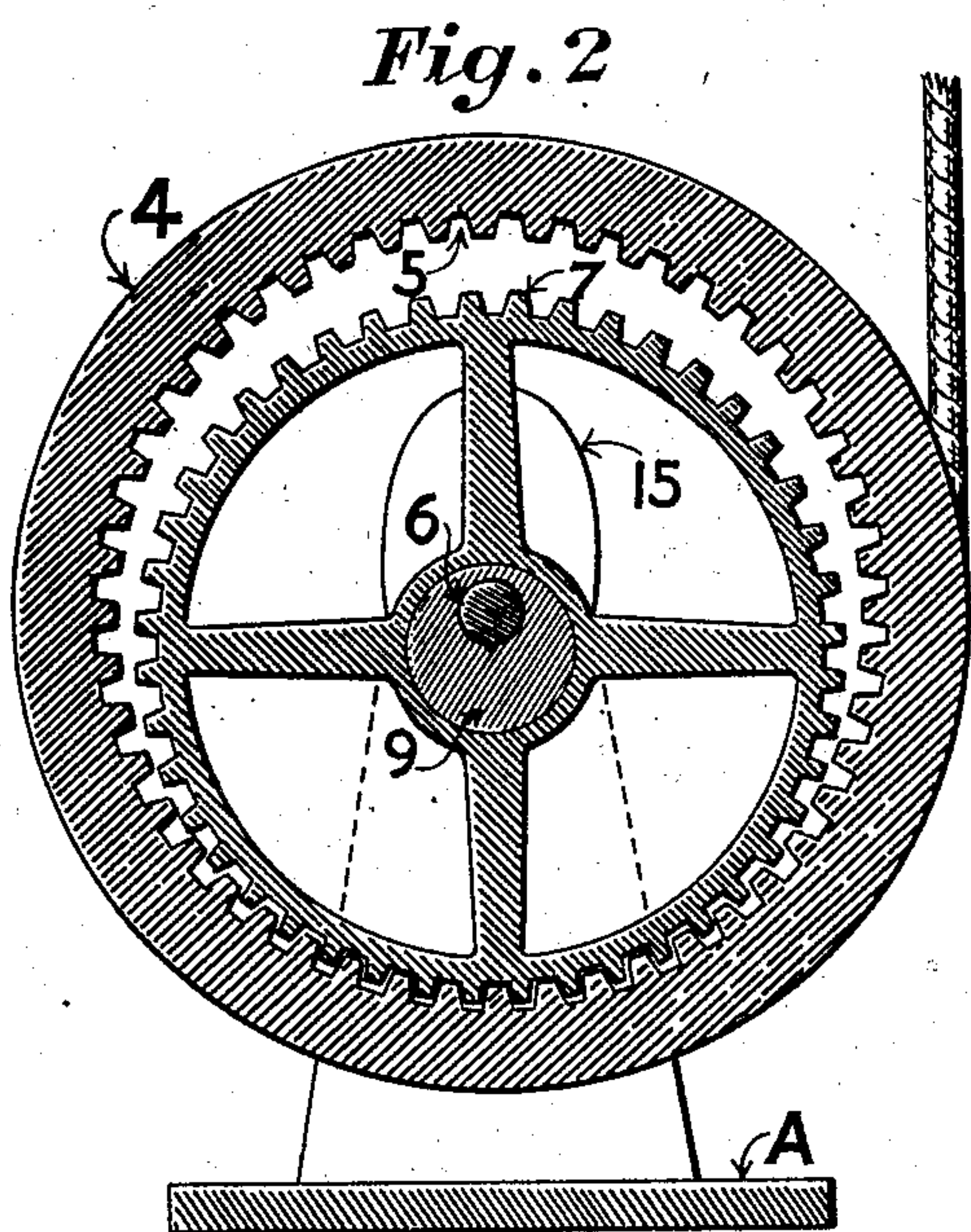
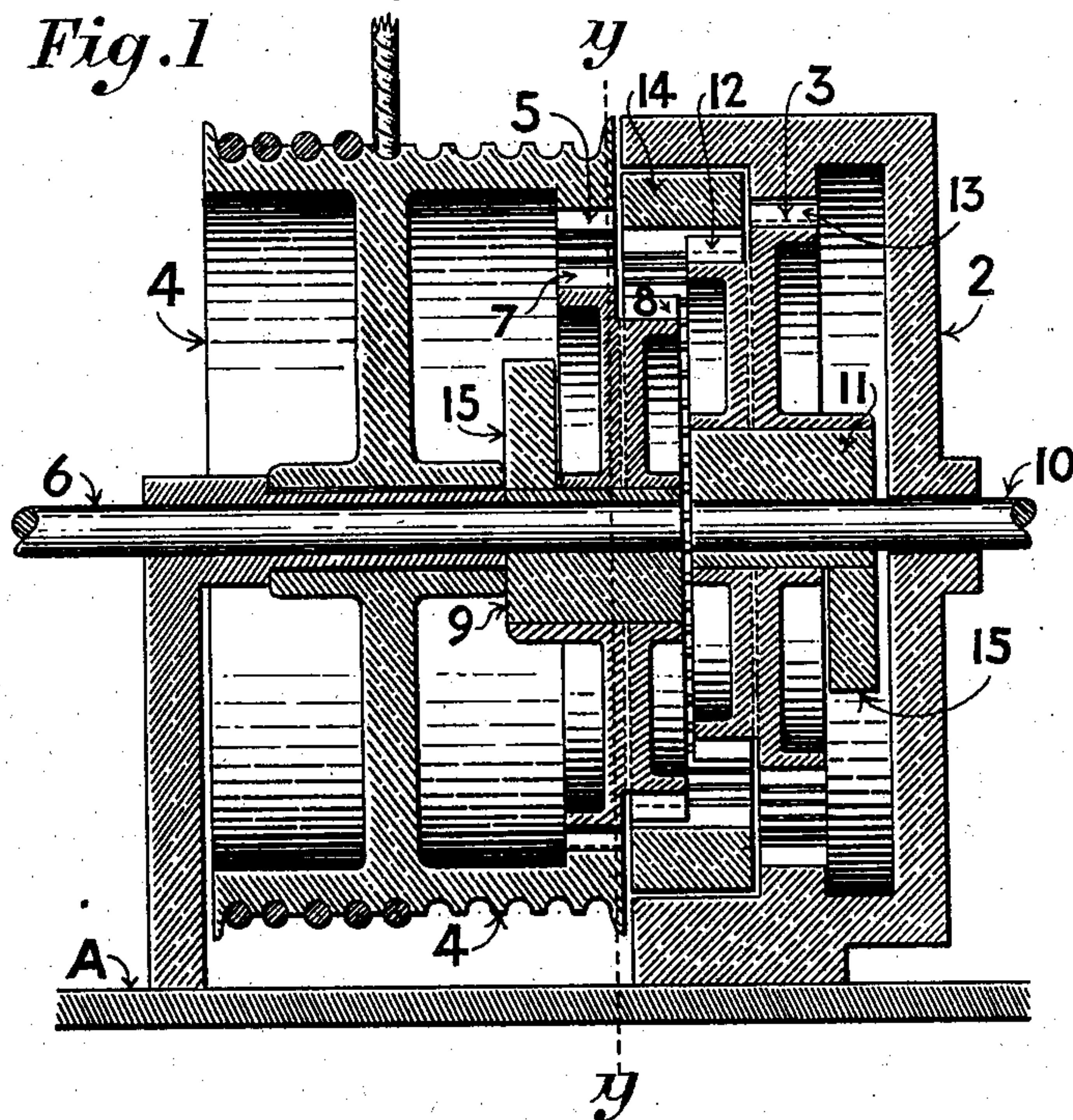
No. 724,663.

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M. A. CLENNAM.  
ELEVATOR DRIVING MECHANISM.

APPLICATION FILED JAN. 18, 1901.

NO MODEL.



Witnesses,  
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# UNITED STATES PATENT OFFICE.

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## ELEVATOR DRIVING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 724,663, dated April 7, 1903.

Application filed January 18, 1901. Serial No. 43,682. (No model.)

*To all whom it may concern:*

Be it known that I, MILTON A. CLENNAM, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Elevator Driving Mechanism; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to improvements in elevator driving mechanisms, and is especially designed to provide a differentially-acting driving mechanism by which I am enabled to vary and reverse the speed of the apparatus without change in the direction of rotation of the motors.

It consists of the parts and the constructions and combinations of parts which I will hereinafter describe and claim.

Figure 1 is a longitudinal center through the section showing double differential gear. Fig. 2 is a transverse section through *y y* of Fig. 1 looking to the left. Figs. 3 and 3<sup>a</sup> show adjusting-bed for cylindrical casing on reduced scale.

As illustrated in my present drawings, A is a bed-plate of any suitable description, upon which the mechanism is carried.

2 is a hollow cylindrical casing within which is fixed an internally-toothed gear 3.

4 is a winding-drum having fixed within it an internally-toothed gear 5. The shaft 6, suitably journaled, passes through the center of the winding-drum 4, the latter being turnable independently of the shaft. Upon the shaft 6 a double spur-gear 7 and 8 is carried. The gear 7 is here shown of larger diameter than the gear 8, and both gears are of smaller diameter than the internal gears within which they are revoluble.

The casing 2 has a shaft 10 extending centrally into it, and this shaft has also an eccentric 11 formed upon it within the casing 2. Upon this eccentric is carried a double spur-gear 12 and 13.

Intermediate between the gears 8 and 12 is an internally-toothed gear 14, which is revoluble within the casing 2, and this gear is engaged by the teeth of the gears 8 and 12, each carried upon its independently-driven eccen-

tric 9 and 11, while the gears 7 and 13 engage the internal gears 5 and 3.

Power to drive the shafts 6 and 10 is derived from independent motors, and by means of the intermediate gear 14 the gears 8 and 12 and their respective shafts are so connected that by varying the speed of the motors the differences in speed will vary the rate of travel of the winding-drum 4. Thus if the speed of the motors is exactly the same no advance will take place. If the speed of one motor be increased beyond that of the other, the drum will be revolved in one direction. If the speed of the other motor be increased beyond the first-named, the movement of the drum will be reversed. Thus all movements of the drum are controlled and forward and reverse motion effected without any change in the direction of motion of the motors, but only a difference in their rate of speed, as described.

This device is especially valuable as applied to elevators, hoists of all descriptions, and in itself provides a sufficient brake to prevent any accident from the running away of the machinery, as the hoisting-drum will remain stationary and locked by the gears at any point at which it may be left.

As this apparatus is designed to run at high speeds, it is necessary to counterbalance the eccentrically-running gears 7 8 12 13, and this is done by means of any suitable counterweights, as shown at 15, fixed to the eccentrics upon the side of the shaft opposite to the larger portion of the eccentric and the gear carried thereby.

In fitting up the apparatus in order to accurately center the parts I prefer to turn off the periphery of the fixed casing 2 and correspondingly turn or form the concavity of the base A so that the two parts will fit together, as shown at 16, and when bolted or secured in place the device is centered to correspond with the bore or center of the opposite standard upon which the drum is carried.

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

1. A fixed casing and internally-toothed



gear, a revoluble drum or part, having a similar internally-toothed gear fixed thereto, a shaft journaled in the casing having an eccentric portion, a double gear whose members  
 5 have different diameters and loosely turnable upon said eccentric and carried thereby, one of said gears engaging the internal gear of the fixed casing, a similar shaft extending through the bearing of the drum having an  
 10 eccentric portion, and a similar double gear loosely turnable upon said eccentric portion so that one of said gears is caused to travel in engagement with the internal gear of the drum, and an internally-toothed gear revolu-  
 15 luble between the internal gears of the casing and the drum, said intermediate gear being engaged by one member of each of the double gears of the drum and casing.

2. In a driving mechanism, a fixed casing,  
 20 a shaft extending into it, with an eccentric portion, a revoluble drum or part axially in line therewith, a shaft extending through said drum or part having a similar eccentric portion, double gears each composed of members  
 25 of different diameter, and each loosely turnable upon one of the eccentrics, internally-toothed gears, one of which is fixed within the casing and the other within the revoluble drum, with each of which one part of one of  
 30 the double gears engages and an intermediate loosely-revoluble internal gear, with the teeth of which the other parts of the double gears engage.

3. The combination in a driving mechanism  
 35 of a fixed internally-toothed gear, a revoluble part, a similar gear carried thereby axially in line with the fixed gear, shafts for said parts said shafts arranged in line, eccentrics carried by the inner ends of the shafts, dou-

ble integral gears of different diameters carried upon each of said eccentrics, an internally-toothed ring engaged by one part of each of said double gears, while the other parts are caused to mesh with the internal gears by their revolution, and counterbalance-  
 45 weights extending in opposite directions from the throw of the eccentrics.

4. In a driving mechanism or hoist, a base having a standard and journal, a revoluble internally-geared drum turnably mounted on  
 50 said journal, a casing fixed axially in line with said drum and having an internal gear and intermediate spur-gears, and an internally-toothed ring, said spur-gears each composed of members of different diameters ec-  
 55 centrically revoluble to engage with both internal gears, said casing having its periphery turned to fit a corresponding concavity upon the base having the same radius whereby the casing and the drum are maintained axially  
 60 in the same line.

5. A driving mechanism consisting of primary and secondary gears of different diameters coaxial with each other and revoluble about a common axis, a shaft axially in line  
 65 with said gears and having an eccentric portion, an intermediate gear turnable upon said eccentric portion, said intermediate gear being in mesh with the primary and secondary gears and serving to transmit motion, and an  
 70 independent driver by which the primary gear may be revolved about its axis.

In witness whereof I have hereunto set my hand.

MILTON A. CLENNAM.

Witnesses:

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 M. F. REILLY.