

No. 660,686.

Patented Oct. 30, 1900.

J. C. HOWELL.

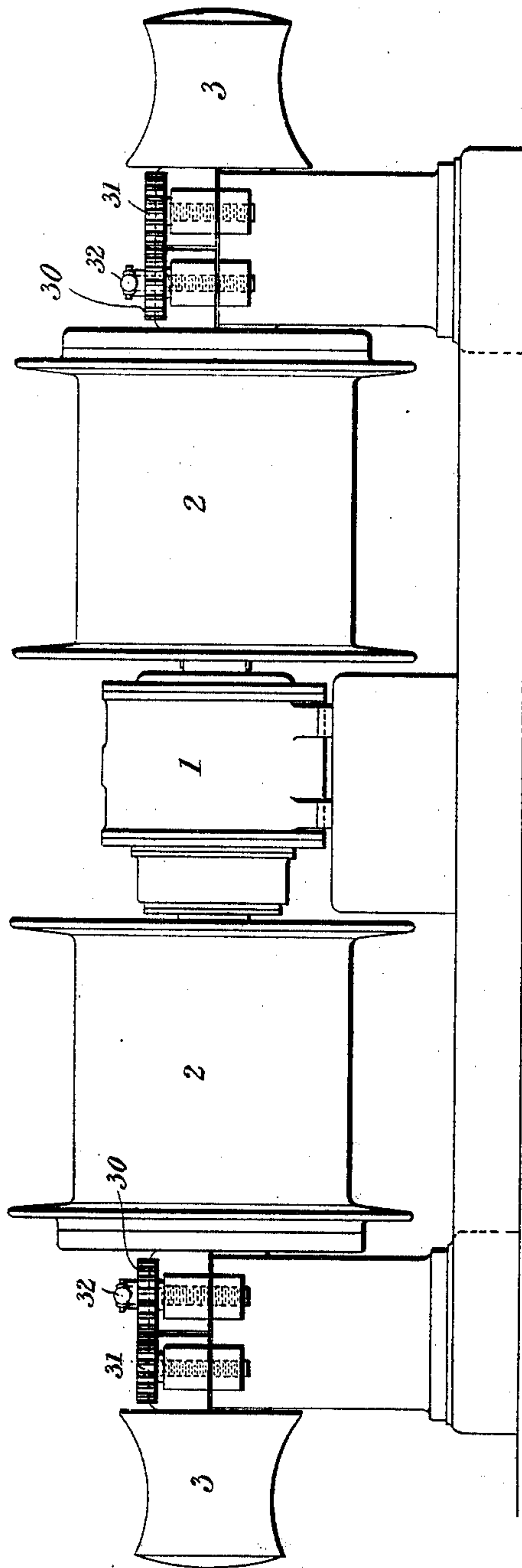
WINCH OR LIKE WINDING GEAR.

(Application filed Dec. 18, 1899.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



WITNESSES.

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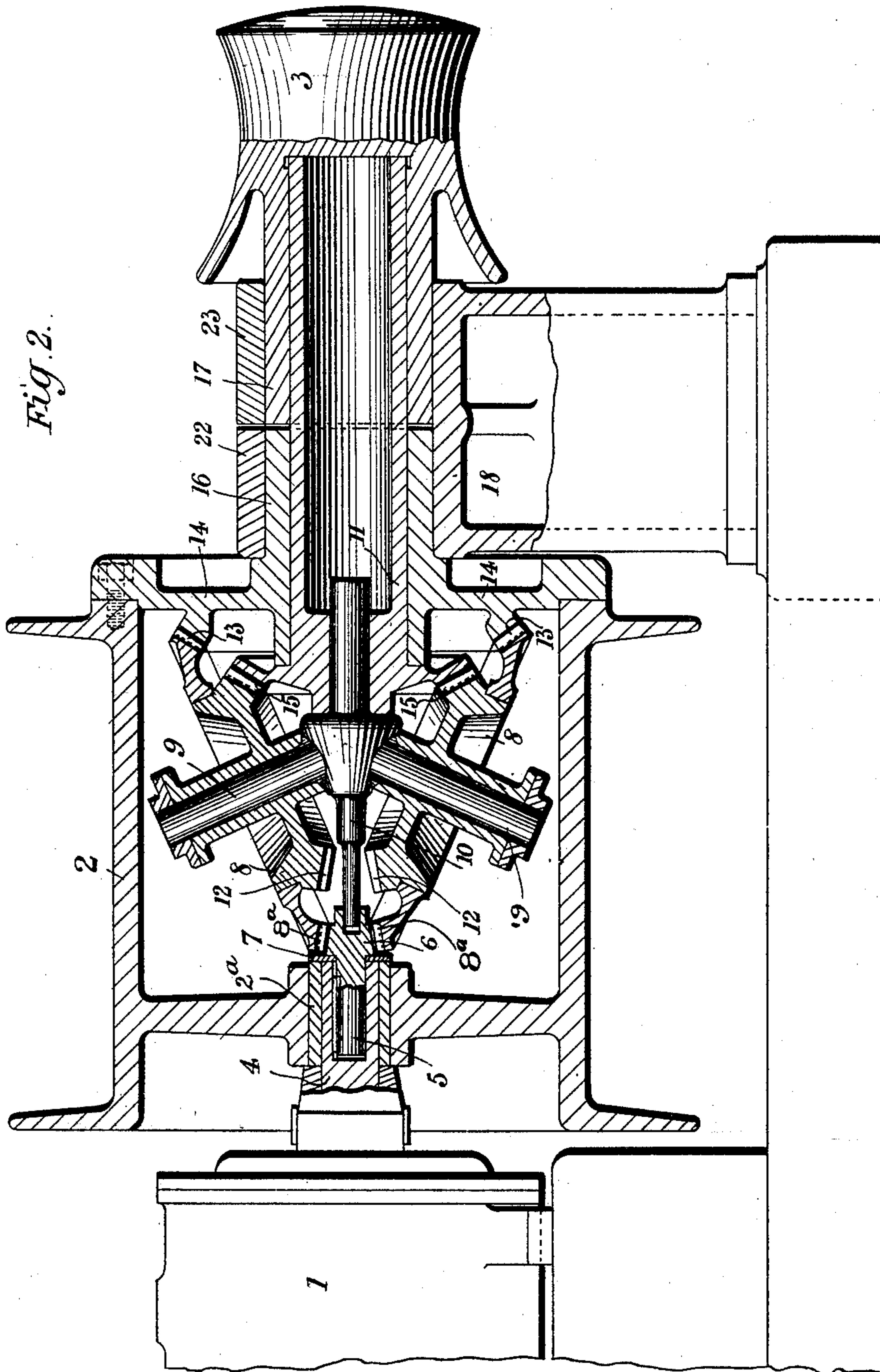
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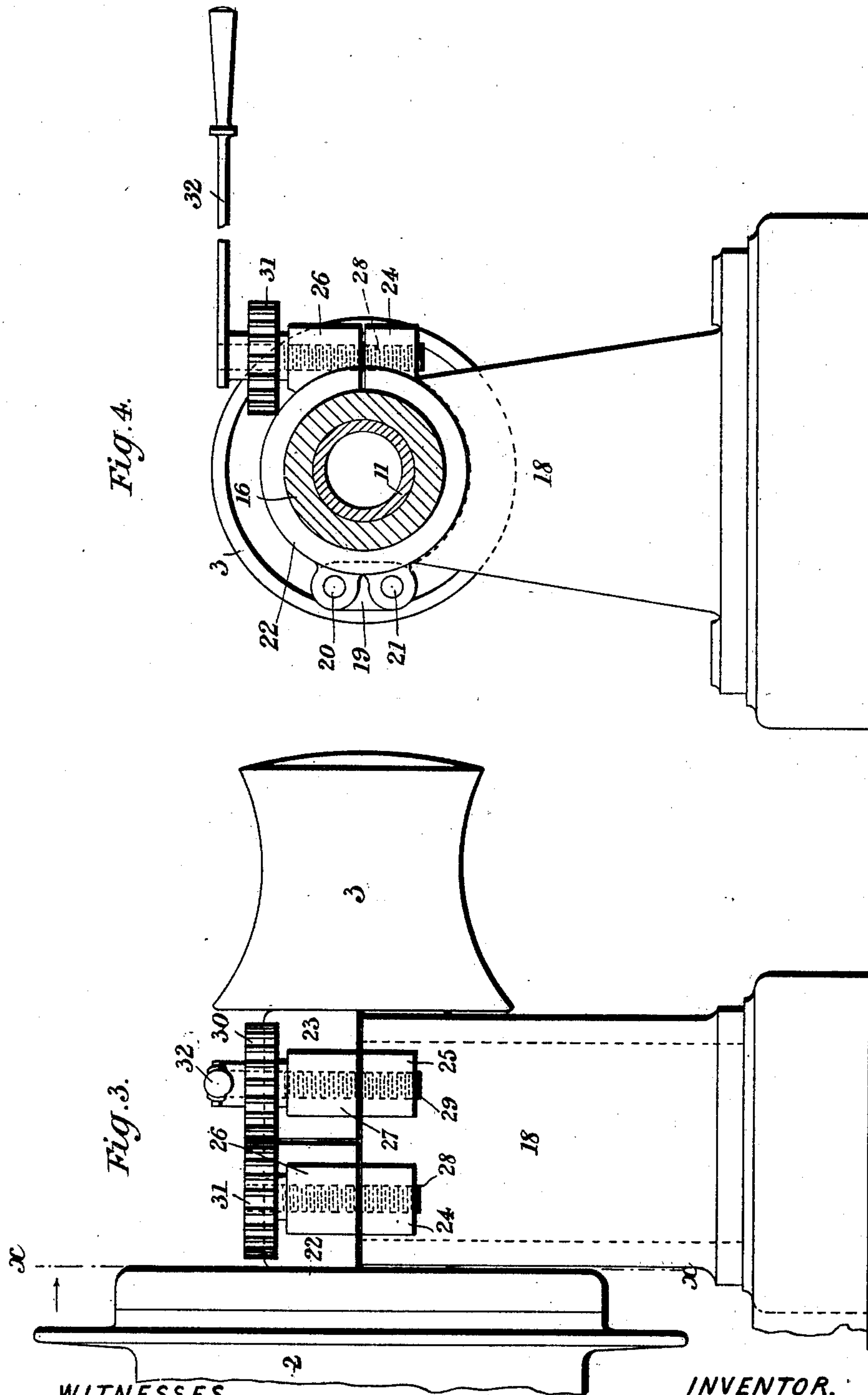
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UNITED STATES PATENT OFFICE.

JOHN CHARLES HOWELL, OF LONDON, ENGLAND.

WINCH OR LIKE WINDING-GEAR.

SPECIFICATION forming part of Letters Patent No. 660,686, dated October 30, 1900.

Application filed December 18, 1899. Serial No. 740,812. (No model.)

To all whom it may concern:

Be it known that I, JOHN CHARLES HOWELL, a subject of the Queen of Great Britain, residing at London, England, have invented a certain new and useful Improvement in Winches or Like Winding-Gear, of which the following is a specification.

This invention relates to improvements in ships' winches or like winding-gear operated by electric motors. Owing to the high speed developed by such motors, it is necessary to use a reducing-gear, as the revolutions of the motor-shaft would be too rapid to be directly applied. According to this invention I employ a reducing-gear capable of reducing from a high speed to a low one and also capable of providing a second or different speed, which arrangement I utilize to combine, in a winch, both a capstan-head and a winding-drum, and I provide means by which one or the other can be put into action, as desired.

In the accompanying drawings is illustrated one form of this invention applicable to a ship's winch.

Figure 1 is an elevation of a ship's winch having two capstan-heads and two drums. Fig. 2 is a sectional elevation, on an enlarged scale, of one of the drums and its gear and capstan-head. Fig. 3 is an elevation, on the same scale as Fig. 2, of the capstan end of the apparatus; and Fig. 4 is a section on line *xx* of Fig. 3.

In the drawings, 1 is the electric motor, 2 2 are the winding-drums, and 3 3 the capstan-heads, the motor being centrally situated between the two.

It will be understood that the arrangement on each side of the motor is identical, so that a single description will suffice.

The reduction-gear is of the class described in Letters Patent of the United States granted to Thomas Humpage on the 11th of July, 1899, under No. 628,469. The reducing-gear is inclosed in the winding-drum 2, which is formed as a closed casing suitable for holding oil. Into this drum projects the high-speed shaft 4 of the motor, said shaft having secured therein the spindle 5 of the first bevel gear-wheel 6 of said gear, the thrust backwardly on same being taken by a washer 7. This wheel gears with the teeth 8^a of a

wheel 8, loose on a stud 9, carried at an angle by a loose spindle 10, supported in the wheel 6 at one end and in the tubular shaft 11 of the capstan-head 3 at the other. The teeth 8^a are shown as separate from wheel 8 (to which they are secured) for convenience of manufacture; but they may form part of the same. The wheel 8 is also provided with a second wheel or set of bevel-teeth 12. The teeth 8^a of wheel 8 gear with a set of bevel-teeth 13 on a plate 14, secured to and forming one end of the drum 2, the other end of which runs freely on a sleeve 2^a on shaft 4, and the second wheel or teeth 12 gears with a wheel 15, secured to or forming part of the shaft 11. The cone of the teeth of wheel 15 is placed in advance of the cone of the teeth 13, as shown, in order to obtain the differential movement. It will be seen that the wheels 8 and 12 and the carrying-stud 9 for same are duplicated, and this is done for the purpose of better balancing the gear; but one set of same is sufficient to effect the reduction. The plate 14 has a sleeve 16 connected to it and fitting over but free on the tubular shaft 11, and the capstan-head 3 has a sleeve 17, also fitting over but secured on the shaft 11. The shaft and sleeves 16 and 17 are carried in a suitable bearing 18, which is provided with two lugs 19, (one of which only is shown in Fig. 4,) in which are hung on pins 20 21 the eyes of split clamping-rings 22 23. The two split ends of these rings carry lugs 24 25 and 26 27, respectively, as shown in Fig. 3, and through each upper and lower lug, forming a pair, passes a screwed spindle 28 29, respectively, such spindles carrying the gear-wheels 30 31, respectively, which engage with each other and one of which carries an operating-handle 32. The openings in lugs 26 and 27 are smooth, and those in lugs 24 25 are threaded.

In the reducing-gear illustrated the wheel 13 acts as a fulcrum-wheel, and when held fast will allow the wheel 12 to transmit motion in a very much reduced form to the wheel 15; but when, on the contrary, the wheel 15 is held, so as to become the fulcrum-wheel, the wheel 8 will rotate the wheel or teeth 13 and cause plate 14 and winding-drum 2 to

revolve. The necessary holding of the parts is effected by the split clamping-rings described. For instance, when the capstan-head 3 is to be driven the handle 32 is moved 5 to tighten the clamp 22 on the sleeve 16, so that plate 14 and wheel 13 are securely held, the engagement of the wheel 30 with the wheel 31 causing the latter to have a reverse movement and so to loosen the clamp 23 and 10 enable the shaft 11, carrying the sleeve 17 of the capstan-head, to revolve freely. When the drum 2 is to revolve, an opposite movement is given to handle 32, thus tightening clamp 23 on sleeve 17 and holding the capstan-head 3, shaft 11, and wheel 15 and loosening clamp 22, thus releasing the sleeve 16; 15 plate 14, and wheel of teeth 13 and enabling the drum 2 to revolve, so that it is free to do the lifting required. The handle 32 controls 20 the load by using the clutch as a brake for lowering it.

What I claim is—

1. In a winding-gear, and in combination, a motor, a drum, a gearing-train inside the 25 same, one of the wheels of the train being driven directly from the motor, another of the wheels of such train being connected to such drum, a capstan-head driven through a further wheel of such train, a clutch adapted 30 for holding the drum, and a clutch adapted for holding the capstan-head so that the gear

will rotate one or other only, substantially as described.

2. In a winding-gear, and in combination, a drum, a gearing-train inside same, one of 35 the wheels of such train forming a part of the drum end, a sleeve connected to such end, a capstan-head, a shaft connecting it with another wheel of such train, means for holding and releasing such shaft and head, means for 40 holding and releasing the sleeve of the drum, and means connecting such two holding and releasing means so that while one is operated to hold its part, the other is operated to release its part, substantially as described. 45.

3. In a winding-gear, and in combination, a pair of winding-drums, a motor situated between same, a gearing-train in each drum, means connecting the trains with the motor, a capstan-head, connected to each train, 50 means whereby a wheel of each train may be held to allow the capstan-heads only to be rotated, and means whereby another wheel of each train may be held to allow the drums only to be rotated, substantially as described. 55

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOHN CHARLES HOWELL.

Witnesses:

PHILIP M. JUSTICE,
ALLEN PARRY JONES.