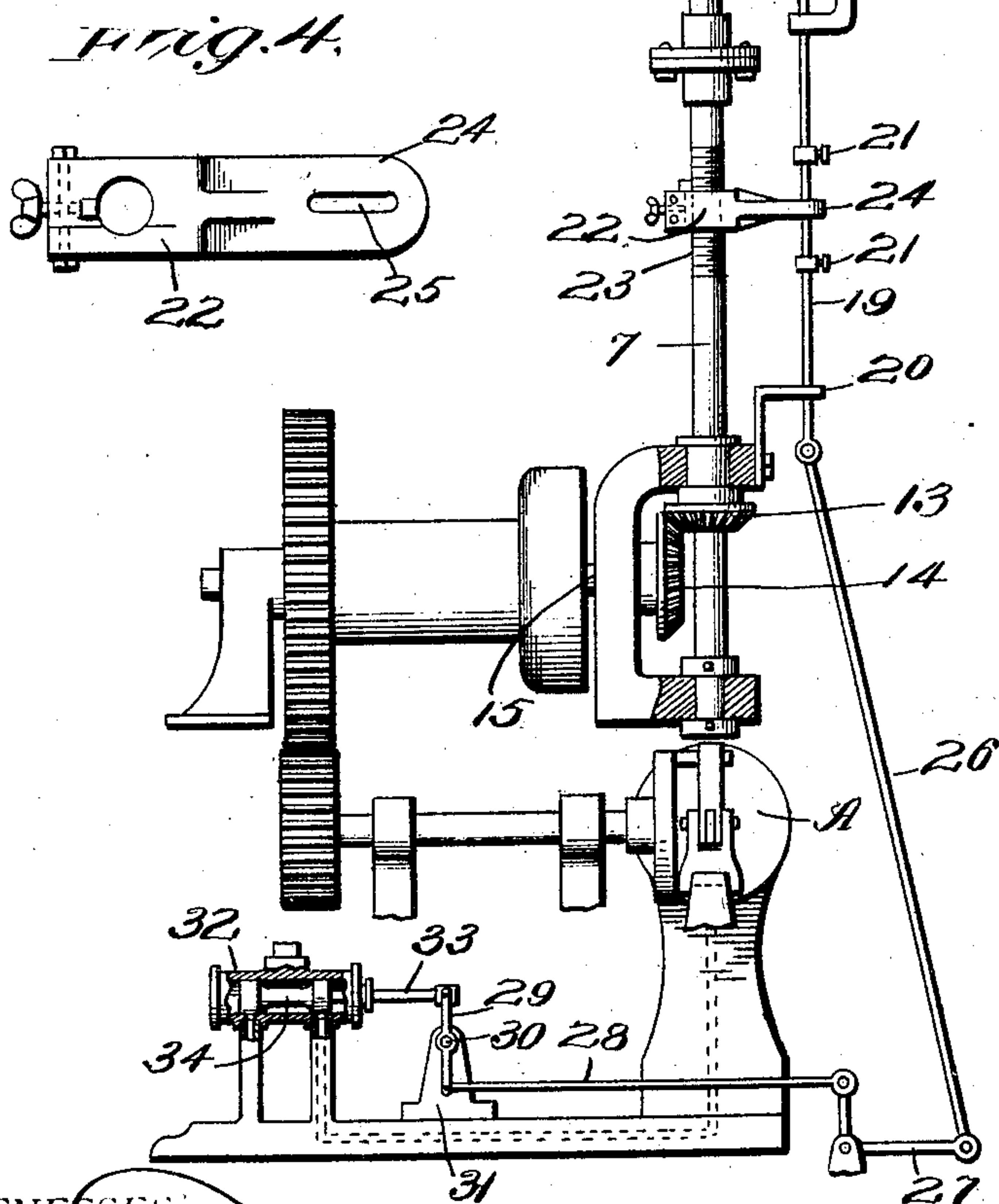
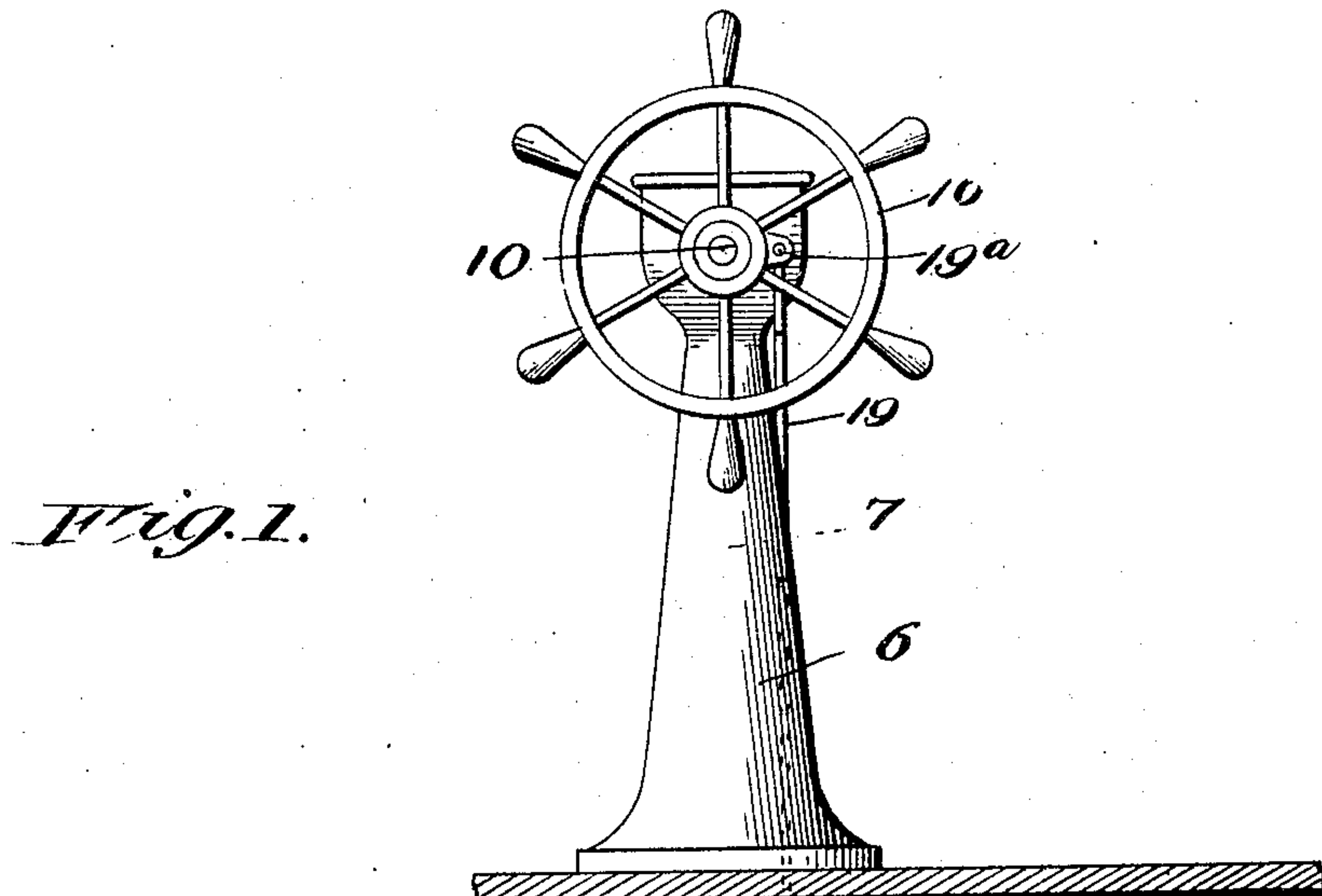


No. 789,836.

PATENTED MAY 16, 1905.

R. BODENLOS.
STEAM STEERING GEAR.
APPLICATION FILED DEC. 29, 1904.

3 SHEETS—SHEET 1.



WITNESSES:

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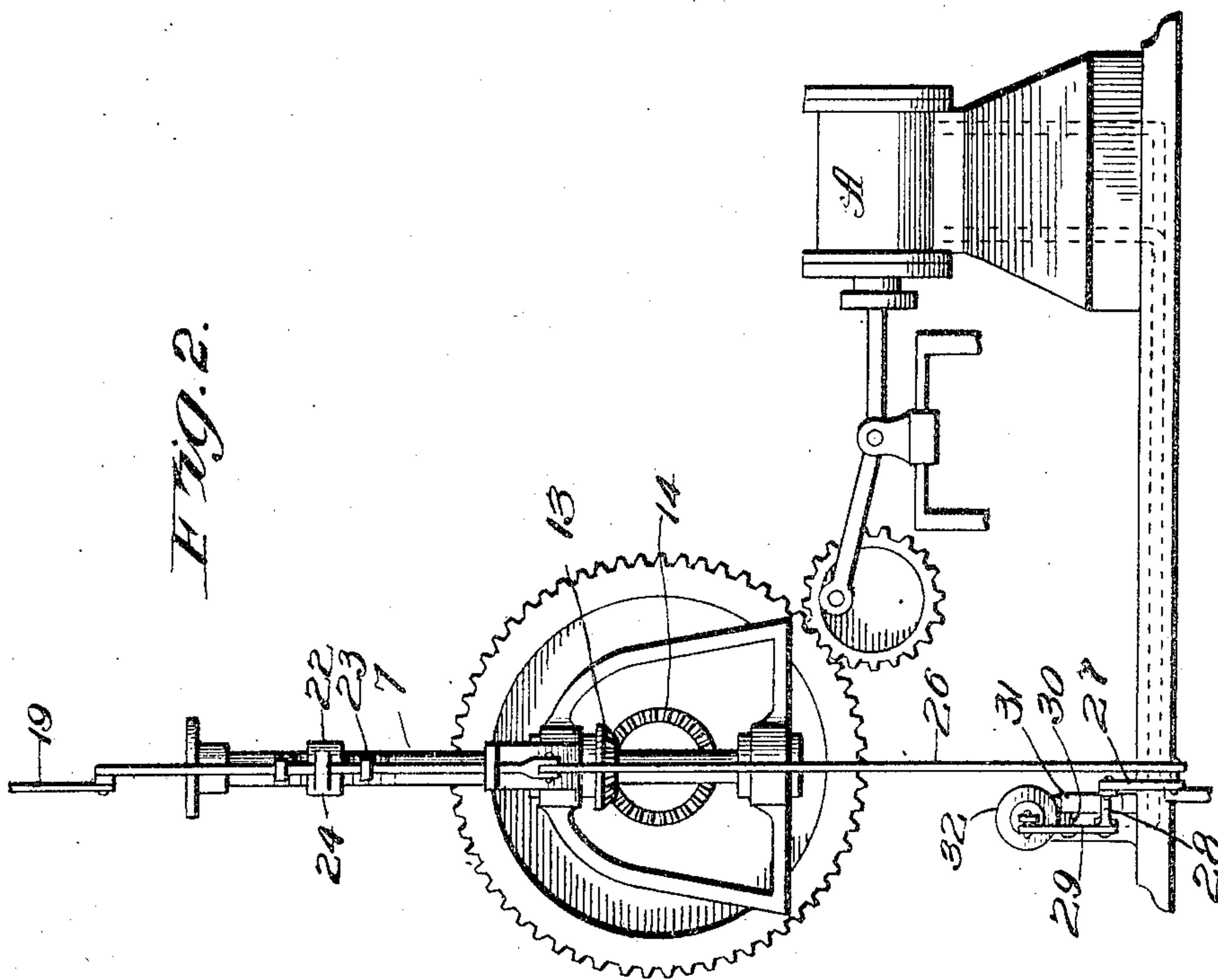
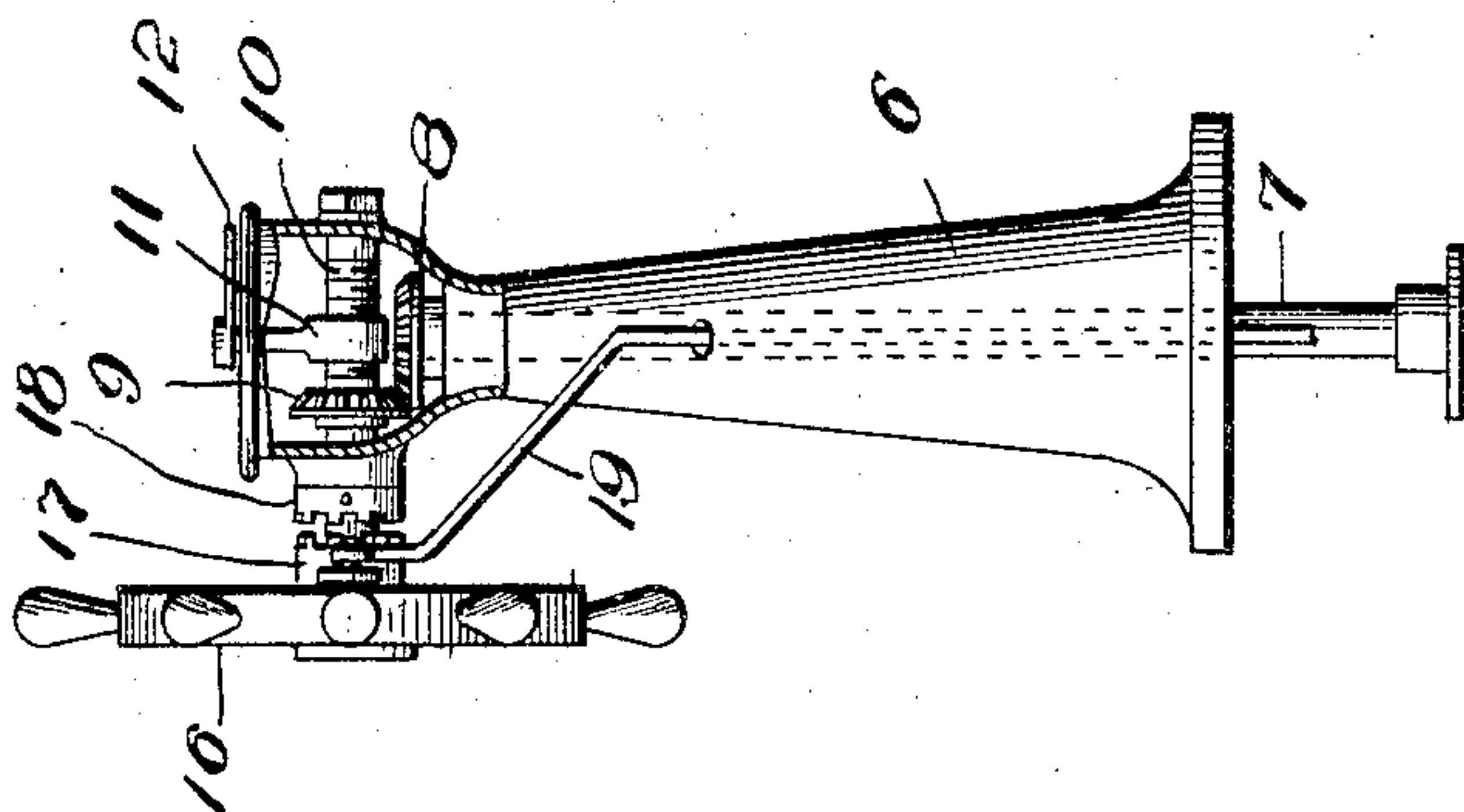
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

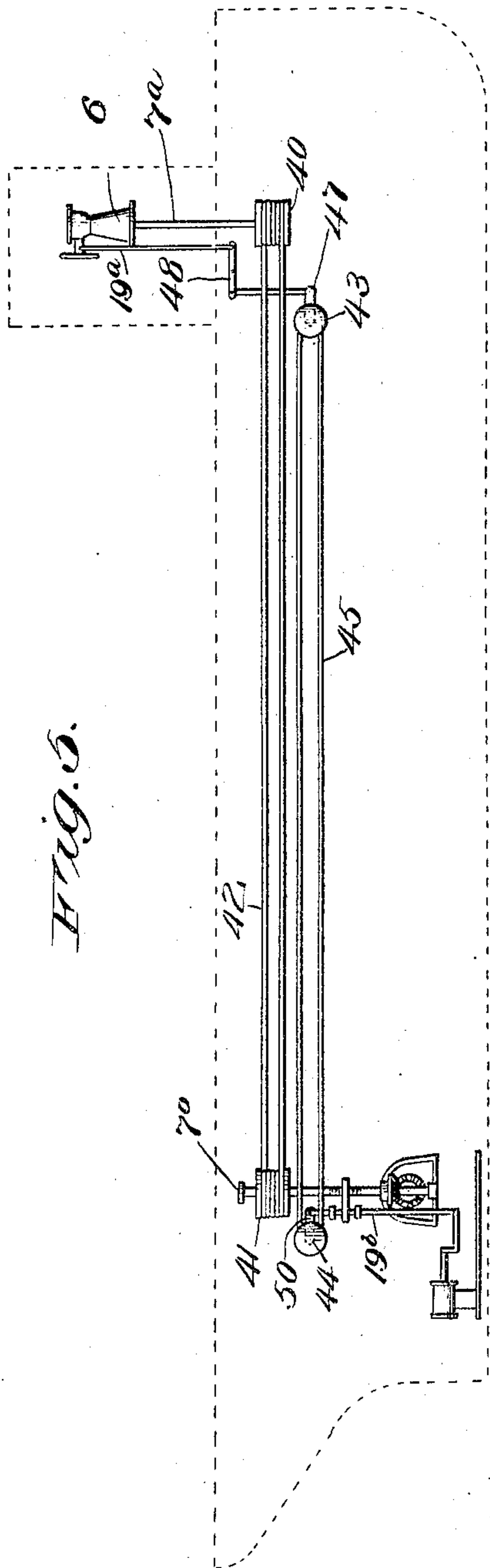


Fig. 5.

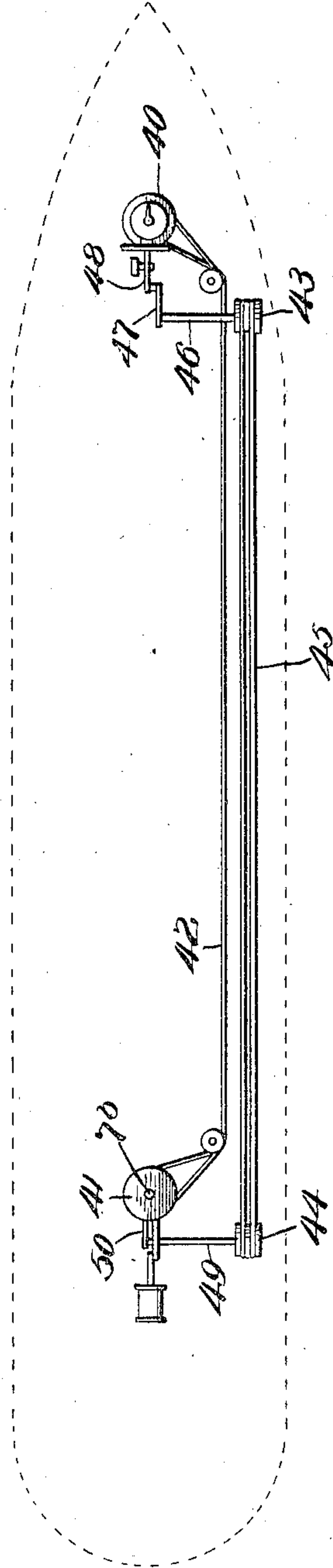


Fig. 6.

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UNITED STATES PATENT OFFICE.

ROBERT BODENLOS, OF CLEVELAND, OHIO.

STEAM STEERING-GEAR.

SPECIFICATION forming part of Letters Patent No. 789,836, dated May 16, 1905.

Application filed December 29, 1904. Serial No. 238,754.

To all whom it may concern:

Be it known that I, ROBERT BODENLOS, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented new and useful Improvements in Steam Steering-Gears, of which the following is a specification.

This invention relates to steam steering-gears; and its object is to remedy defects incident to old constructions and to provide an apparatus by which the operation of the engine which turns the cable-drum can be easily controlled. A direct connection is provided from the steering-wheel to the throttle-valve of the engine, and means are provided to disengage the hand steering-gear, so that when the steam-gear is in operation practically the only labor to be performed by the helmsman is to move the throttle-valve as he desires. Automatic stops are provided to close the valve and stop the engine when the rudder is set or becomes hard over.

In the accompanying drawings, Figure 1 is a general side view of the gear, parts being shown in section. Fig. 2 is a front elevation of the parts below deck. Fig. 3 is a front elevation of the wheel-stand. Fig. 4 is a top view of a traveling stop-nut. Figs. 5 and 6 are diagrammatic elevation and plan of the invention as applied to a vessel where the steering-engine is distant from the wheel-house.

Referring specifically to the drawings, 6 indicates the wheel-stand, containing the upright shaft 7, which extends through the deck to the steam steering-gear below. The shaft has at the top a bevel-gear 8, meshing with a bevel-gear 9 on the wheel-shaft 10. This shaft is threaded for a portion of its length and carries a nut 11, which operates the pointer at 12, to indicate the direction, in a known manner. Below deck the shaft 7 has a bevel-gear 13, which meshes with the bevel-gear 14 on the drum-shaft 15. It is obvious that if the wheel-shaft 10 be turned, as in hand-steering, the drum-shaft will be turned accordingly; also, that if the drum-shaft be turned by the steam steering-gear the upright shaft 7 and wheel-shaft 10 and pointer 12 will be turned accordingly.

The wheel 16 is loose on its shaft, and in the operation of the steam steering-gear it is turned independently thereof. It carries one member, 17, of a clutch, the other member, 18, of which is fast on the shaft 10. When hand-steering is to be done, the wheel is shoved in on the shaft and the clutch members engage. The shafts and drum can then be turned by the hand-wheel. Normally, of course, the steam-gear will be used, the hand-gear being used only in case of disablement of the steam-gear or other unusual condition. It will be seen that one wheel serves for both gears.

The engine of the steam steering-gear is indicated at A, geared to the winding-drum in any suitable manner, unnecessary to describe here, as it forms no part of my invention, which has to do with the means for controlling the engine.

Connected to the wheel 16 is a rod 19, which extends through the deck and down beside the shaft 7. This rod is movable up and down through guide-brackets 20 and carries stop-collars 21.

22 is a nut which travels on a threaded portion 23 of the shaft 7, and the nut has an arm 24, which projects between the stop-collars 21 and has a slot 25, through which the rod 19 extends. The stop-collars are set so as to be struck by the arm of the nut when or just before the hard-over positions are reached.

The lower end of the rod 19 is connected by a rod 26 to one arm of a bell-crank 27, the other arm of which is connected by a drag-link 28 to one arm of a lever 29, which is pivoted at 30 upon a bracket 31, adjacent the throttle-valve casing 32 of the engine. The other arm of the lever 29 is connected to the stem 33 of the reversing and throttle piston valve 34 of known construction. When the valve is moved to one end of its casing, it starts the engine in one direction, and when it is moved to the other end it starts the engine in the other direction, and when it is moved to middle position it stops the engine.

The operation of the steam-gear is as follows: By giving the steering-wheel 16 a small turn, which need not be over one-eighth, the connecting-rods 19 and 26 are raised or low-

ered, and by the bell-crank and lever connections the throttle-valve is moved and the engine is started in the desired direction. This turns the winding-drum and its shaft and also the upright shaft 7, as above described. The turn of the shaft 7 causes the nut 22 to travel up or down thereon, and when the hard-over position is reached the arm of the nut strikes the stop-collar 21, and carrying the rods and connections with it, brings the throttle-valve back to mid-position, which in consequence stops the engine and leaves the helm hard over until further manipulation. To swing the helm back, the engine is started again, in the reverse, by moving the steering-wheel in the opposite direction. In either operation the engine will be stopped in the hard-over position by the automatic stopping devices, the direction of the screw 23 being such that the nut 22 will move the rod 19 in the direction opposite to its movement when the engine was started. If it be desired to stop the engine before it is brought to a standstill by the automatic device, it is simply necessary to bring the hand-wheel 16 to the mid-position, which shuts the throttle and stops the engine. So it is not necessary for the helmsman to do more than to turn the hand-wheel slightly one way or the other, whichever way he wants the engine to work, until the rudder is brought to the desired position, as shown by the indicator on the top of the wheel-stand. The only exertion required is that sufficient to move the throttle-valve and its connections, and the throttle being a piston-valve is nicely balanced and works very easily. When it is desired to use the hand-gear, it is done by engaging the clutch as above referred to and by disconnecting the rod 19 from the wheel by removing the pin 19^a by which it is attached thereto.

Figs. 5 and 6 illustrate a modification in which the pilot-house is at the bow and the steering-engine at the stern of the vessel and in which consequently long connections must be used, the principle of the operation, however, remaining the same. In these views the wheel-stand shaft 7^a carries a drum 40 and the upright shaft 7^b carries a drum 41. A cable 42 extends around these drums, so that the motion of one is communicated to the other with the same effect as if the shafts were direct connected. The connections from the wheel to the rod 23 at the controlling-valve of the engine include drums 53 and 44, around which extends a light cable 45. The drum 43 is carried on a rock-shaft 46, operated by a crank-arm 47, connected to one end of a lever 48, the other end of which is connected to the rod 19^a. The drum 44 is carried on a rock-shaft 49, which has a crank-arm 50 connected to a rod 19^b. The portions 19^a and 19^b correspond to the rod 19 above and below deck shown in the other views. In this construction—that is, the one shown in Figs. 5 and 6—

the connections between the wheel and the throttle-valve permit of its operation in a manner similar to that above described, since the drums will be turned or rocked and the connections moved accordingly. Also the cable 42 and the drums around which it extends will operate the indicator in the wheel-stand.

Having thus described my invention, what is new, and desired to be secured by Letters Patent, is—

1. In a ship's steering-gear, in combination, a hand-gear having a wheel-shaft, a power-gear having a controlling-valve mechanism, and a helmsman's wheel loose on the wheel-shaft and engageable with either the hand-gear or the valve mechanism and disengageable with the other, to steer the ship with either gear.

2. In a ship's steering-gear, in combination, a power-gear, a hand-gear having a wheel-shaft, an engine for the power-gear having a controlling and reversing valve, a helmsman's wheel loose on said shaft, detachable connections between the wheel and the valve to operate the latter, and a clutch for connecting the wheel and shaft when the said connections are detached.

3. In a ship's steering-gear, in combination, a power-gear and its engine having a controlling and reversing valve, a rod connected to said valve and arranged to be operated by the helmsman, stops on the rod, a screw-shaft geared to the winding-drum of the power-gear, and a traveling nut on said screw, having a projection extending between the stops in position to strike the same and shift the rod to close the valve when the helm is hard over.

4. In a ship's steering-gear, in combination, a winding-drum, a valve-controlled motor and a hand-wheel shaft geared thereto, a hand-wheel loose on the shaft and having a clutch engageable therewith, and detachable connections between the hand-wheel and the valve of the motor.

5. In a ship's steering-gear, in combination, a winding-drum, a power-gear connected thereto, an upright shaft geared to the drum and extending to the wheel-stand and having a threaded portion, a wheel-shaft on the stand, geared to said shaft, a helmsman's wheel loose on the wheel-shaft and having a clutch engageable therewith, a rod connected to the wheel and to the controlling devices of the power-gear and extending beside the upright shaft, stops on the rod, and a traveling nut on the threaded portion of the upright shaft, having a projection arranged to strike the stops, for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ROBERT BODENLOS.

Witnesses:

JOHN A. BOMMARDT,
LOTTIE NEWBURN.