

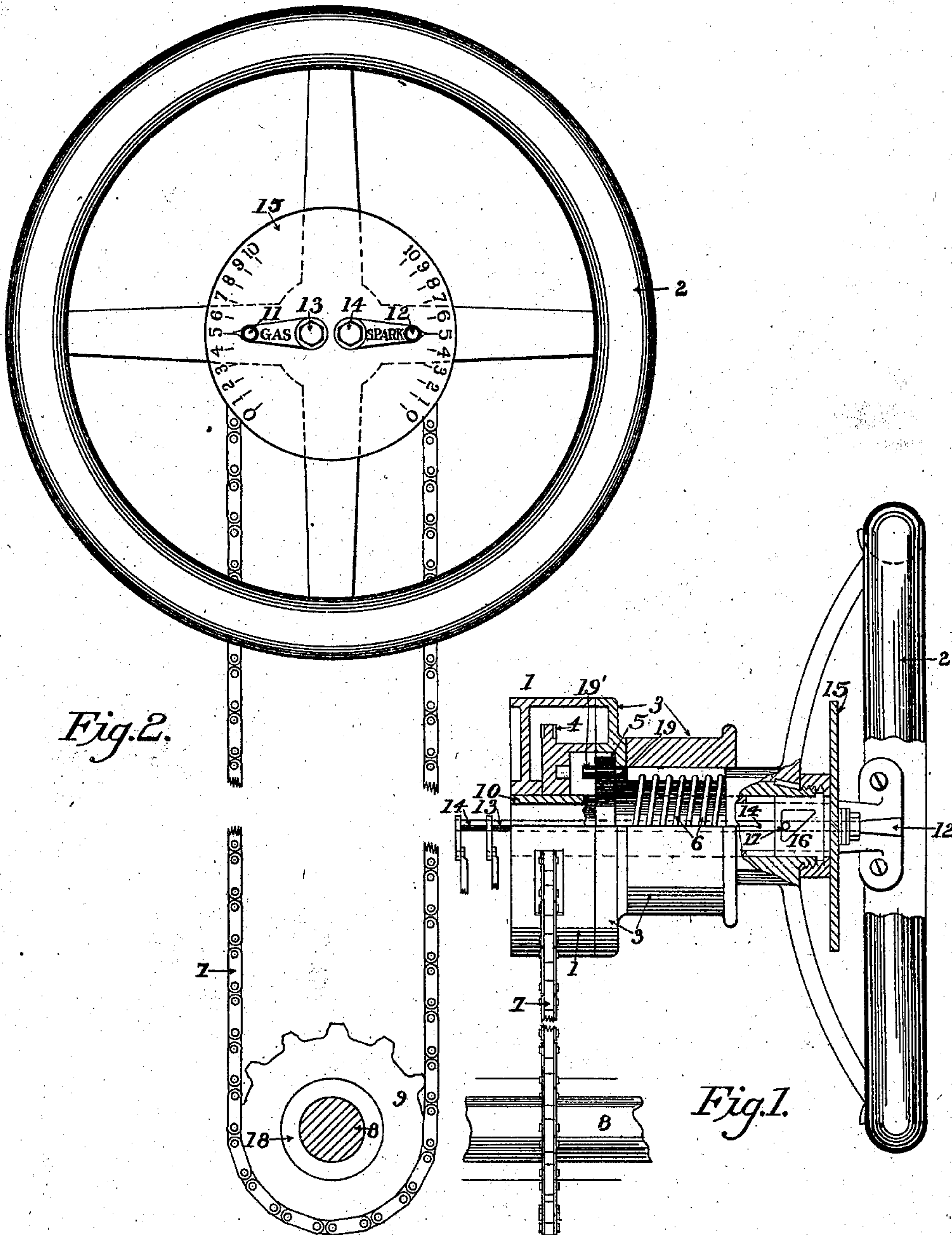
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STARTING AND CONTROLLING INTERNAL COMBUSTION ENGINE DRIVEN
LAUNCHES AND VEHICLES.

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STARTING AND CONTROLLING INTERNAL-COMBUSTION-ENGINE-DRIVEN LAUNCHES AND VEHICLES.

No. 840,694.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, MARSHALL WILFRED HANKS, a citizen of the United States, residing at Madison, in the county of Dane and State of Wisconsin, have invented new and useful Improvements in the Starting and Controlling of Internal-Combustion-Engine-Driven Launches and Vehicles, of which the following is a specification.

My invention relates to that class of engines in which the initial rotation is brought about by some external power. This initial rotation is generally brought about by placing a detachable crank directly on the end of the engine-shaft, and by giving this crank a turn rotation is imparted to the engine. In launches and vehicles this method is not only troublesome, but is decidedly inconvenient, as it does not allow the operator to start his engine and guide the launch or vehicle from the same place.

I am aware of engine-starting devices that have been operated from a point convenient to the steering and controlling levers in launches and vehicles; but they have not always proved successful on account of the tendency to confuse the operator because of unnecessary levers, or the principles used were too complicated to allow the making of a good serviceable device.

It is the object of the present invention to combine suitable means for starting, controlling, and stopping internal-combustion engines with the guiding or steering devices common to launches and vehicles carrying this class of engine in such a manner that the number of levers will be reduced to a minimum, and the controller will be simple, positive of action, and of durable construction. With a controller of this sort the operator can not only start and stop his engine from the operating-seat, but has complete control over the speed and guidance of the launch or vehicle.

To this end I have provided a device shown in elevation in Figures 1 and 2 of the drawings accompanying this specification.

This device provides for a combination steering-wheel and engine-starter in which the steering-wheel is normally interlocked with the steering-gear. The engine is started by simply pushing the steering-wheel forward about one inch and then giving it a turn. Upon the release of the forward pressure on the steering-wheel it automatically re-

turns to its normal position, thereby disconnecting the engine-starting device and again interlocking with the steering-gear.

Fig. 1 shows the controller partly in elevation and partly in section with a sprocket-chain 7 connecting it with the shaft 8 of an internal-combustion engine. Gas and spark lever connecting rods 13 and 14 also lead from the controller to the gas-controlling and spark devices on the engine. As the engine and controlling devices pertaining directly thereto are not a part of the invention, they have not been shown on the drawings. Fig. 2 shows the front elevation of Fig. 1 with the broken sprocket-chain 7 connecting the controller and engine-shaft 8.

Referring to Fig. 1 of the drawings, 1 is the main supporting-frame, to which the hollow supporting-bearing 10 is rigidly secured. The clutch-cylinder 5 and sprocket 4 are mounted so as to rotate on the hollow supporting-bearing 10. The steering-drum 3 is rotatively mounted on the clutch-cylinder 5. The clutch-cylinder 5 is provided with an annular flange 5', carrying oppositely-projecting pins 19 19', adapted for alternate engagement with holes respectively in the steering-drum 3 and sprocket 4, said cylinder being slidable on the bearing 10 and moved by hand-pressure on the wheel 2 to disengage the pins 19 from the drum and bring the pins 19' into engagement with the sprocket-holes, the movement being against the action of a spring 6, coiled around the cylinder. Pressure being removed, the spring 6 expands to retract the cylinder and cause reengagement of the pins 19 and drum 3. Sprocket 4 has no longitudinal play, and the steering-drum 3 does not move longitudinally by virtue of the spring 6 holding it against the main supporting-frame 1.

The steering-wheel 2 and the clutch 5 are rigidly fastened together so they rotate as one. A pressure on the steering-wheel 2 to the left, parallel to the axis of rotation and sufficient to compress the coiled spring 6, will move the clutch from the drum 3 to the sprocket 4. A rotation now of the wheel 2 will cause the sprocket 4 to rotate, as well as the engine-shaft 8, as the engine-shaft 8 and sprocket 4 are connected by a suitable chain. When the engine starts, neither the sprocket 9 nor the chain 7 can rotate by reason of a pawl-and-ratchet means 9' or any other suitable device well known to the art interposed be-

tween the shaft 8 and the sprocket 9, which allows an interlocking only when the speed of the sprocket 9 exceeds that of the shaft 8. A release of the pressure on the wheel 2 is followed up by the expansion of the spring 6, causing the clutch-pin 19' to automatically disengage from the sprocket 4 and the clutch-pin 19 to engage with the steering-drum. A rotation now of the wheel 2 will cause only the steering-drum 3 to rotate. Although the engine is rotating, the sprocket-chain is not rotating by reason of the pawl or any other suitable device interposed between the engine-shaft 8 and the sprocket-wheel 9. To the steering-drum 3 are attached the usual connecting-cables for moving the rudder.

In order that the controller may be complete in every detail, the gas-regulating or gas-mixing valves on the engine and also the device for changing the point of igniting the explosive charge in the engine-cylinders are connected with the gas and spark levers 11 and 12 (shown in Fig. 2) through the connecting-shafts 13 and 14. These connecting-shafts 13 and 14 pass through the hollow supporting-shaft 10. A movement of the gas-lever 11 about its axis will change the quantity or quality of the gas flowing to the engine, and this quantity or quality will be relatively indicated by the position of the lever with reference to the numbers on the left of the dial-plate 15. In like manner the point of ignition of the charge will be relatively indicated by the position of the spark-lever 12.

It is also advisable and important to provide means for automatically bringing the spark-controlling devices to the starting positions before engine is started, as otherwise the engine may kick back and start rotating in the opposite direction from that intended. A device for accomplishing this is shown in section in the right of Fig. 1. The key 16 is loosely mounted in a slot cut in the supporting-bearing 10, so that it travels forward with the wheel 2 when engine is to be started and back when the spring 6 pushes the wheel back into place, but does not rotate with the wheel. The spark-lever rod 14 passes to one side of the key 16, as shown in the drawings. Cut in the key 16 is a V-slot 16', into which projects a pin 17, rigidly fastened into the spark-controlling shaft 14. When the key 16 is moved to the left by reason of its being pushed by the wheel 2, the forty-five-degree side of the slot comes in contact with the pin 17, and as there is no longitudinal play to this pin it moves up, rotating the shaft 14 and bringing the spark-lever 12 to the zero position. When the pressure on the wheel 2 is released, the key moves to the right, and the upper side of the slot moves along the pin 17 until it comes to rest, with the pin in the upper left-hand corner. A movement now of the spark-lever to No. 5 on the dial 15 will

bring the pin 17 to the position shown on the drawing Fig. 1.

Other devices for starting internal-combustion engines by means of a steering-gear may readily be worked out, and the one shown in the drawings accompanying this specification is simply one of many good methods, and I desire it to be understood that my invention is not limited to specific details of construction any further than such details are specifically set forth in the claims.

I claim as my invention—

1. In an internal-combustion engine, the combination with a steering means, of a starting means, means for controlling the point of gas ignition in the engine-cylinder, means actuating the ignition-controlling means to bring the point of ignition to the starting position by the operation of the starting means and an actuating element movable into position for connection with said steering means and said starting means and ignition-controlling means alternately.

2. In an internal - combustion - engine-driven launch or vehicle, steering means, engine-starting means, and an actuating element for said means movable into positions for connection with said steering means and starting means alternately.

3. In an internal - combustion - engine-driven launch or vehicle, steering means, engine-starting means, and an actuating rotatable element for said means movable into positions for connection with said steering means and starting means alternately.

4. The combination of a steering-shaft a starting member connected to the engine-shaft, and a steering-wheel movable lengthwise on its shaft and having means to engage the starting member by such lengthwise movement and operate the same by its rotation.

5. The combination of steering means including a wheel, a support along which the wheel is movable, and engine-starting means actuated by said wheel in one position of the latter.

6. In an internal - combustion - engine-driven launch or vehicle, the combination with a hand-wheel, a steering-drum and a starting means, said hand-wheel being movable into position for connection with said steering-drum and starting means alternately.

7. In an internal - combustion - engine-driven launch or vehicle, a hand-wheel, a steering-drum, a starting means, and a spring-pressed sliding clutch fixed to the wheel and arranged to engage the drum and starting means alternately.

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