

No. 742,070.

PATENTED OCT. 20, 1903.

C. F. SAYLOR.
APPARATUS FOR REVERSING STEAM ENGINES.
APPLICATION FILED JUNE 16, 1903.

NO MODEL.

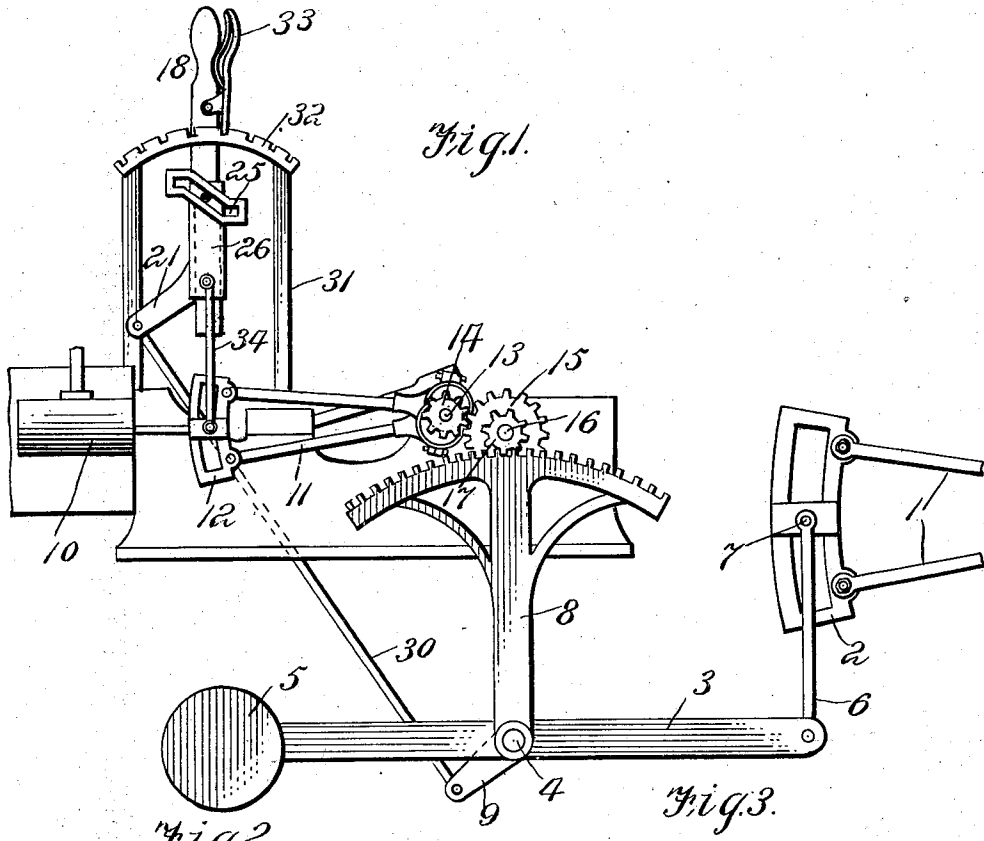
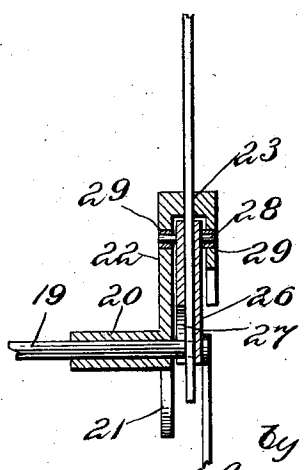
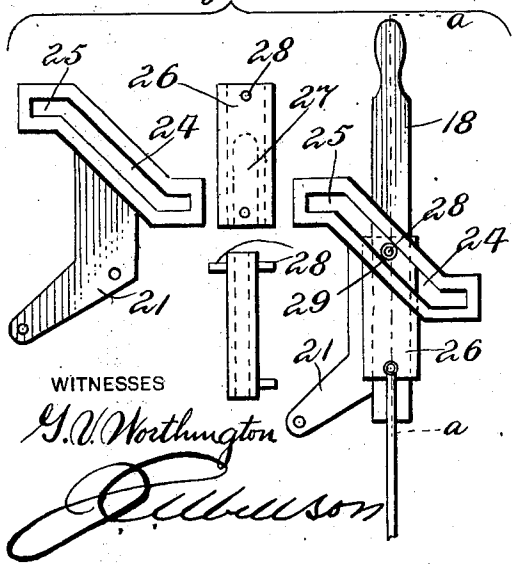


Fig. 2



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APPARATUS FOR REVERSING STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 742,070, dated October 20, 1903.

Application filed June 16, 1903. Serial No. 161,652. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. SAYLOR, a citizen of the United States, residing at Murphysboro, in the county of Jackson and State of Illinois, have invented certain new and useful Improvements in Apparatus for Reversing Steam and other Engines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention is an improved power-driven apparatus for reversing large steam and other engines; and it consists in the construction and combination of devices hereinafter described and claimed.

The object of my invention is to provide an improved apparatus of this character which is efficient for reversing the motion of steam and other engines and machines which are so large as to render it extremely laborious and inconvenient to reverse them by manual power in the ordinary way.

In the accompanying drawings, Figure 1 is a side elevation of a reversing apparatus embodying my improvements. Fig. 2 is a detail elevation, on a larger scale, of the lever and its immediate connections. Fig. 3 is a detail sectional view taken on a plane indicated by the line *a a* of Fig. 2.

In Fig. 1 of the drawings the eccentric-rods of the usual link-motion of a steam-engine are indicated at 1 and the link to which they are attached is indicated at 2. A lever 3, which is fulcrumed at 4 and is provided at one end with a counterweight 5, has its opposite end connected by a rod 6 to the link, the connection between the said rod and the said link being indicated at 7. A segment-gear 8 is rigidly connected to the shaft 4, which forms the fulcrum for the lever 3, and an arm 9 is also connected to the said shaft.

A starting and reversing engine 10 of suitable construction is provided with the usual link-motion, the eccentric-rods thereof being indicated at 11 and the link at 12, and the crank-shaft 13 of this starting and reversing engine is provided with a pinion 14, which engages a gear-wheel 15. The latter is fast on a shaft 16, which in practice is mounted in suitable bearings, and a pinion 17 is fast on said shaft 16 and engages the gear-segment 8.

A starting and reversing lever 18, which controls the operation of the starting and reversing engine, is fastened to a shaft 19 of suitable length, which shaft is mounted in suitable bearings, and on the said shaft is a sleeve 20, which is loose thereon, is provided with a crank-arm 21, and is also provided with an upstanding arm 22, the latter being preferably of the form shown in Figs. 2 and 3 of the drawings, bent into inverted-U shape and having an oblong opening 23 in its upper portion, through which the lever 18 extends and in which opening said lever is adapted to move back and forth, so that the lever 18 and arm 22 are each movable angularly independently of the other. The sides of the lever 22 on opposite sides of the lever 18 are provided with transversely-disposed and inclined cam-slots 24, the extreme end portions of which are of a radius centering at center of shaft 19. The front and rear sides of the said arm 22 are spaced apart a sufficient distance to clear a slide 26. The same may be of any suitable construction. It is here shown as a block having an opening extending vertically therethrough from end to end, through which opening the lever 17 extends, and the said block being slidable vertically on the said lever. The inner side of the said block is provided at its lower end with an open-ended slot 27 to clear the shaft 19, so that the said block may move transversely with reference to the said shaft, and from the front and rear sides of the said block, near the upper end thereof, project studs or axes 28, on which are antifric-tion-rollers 29, that engage and operate in the cam-slots 24 of the arm 22. A rod 30 connects the crank-arm 21 to the crank-arm 9. In the embodiment of my invention here shown there is also provided a stand 31, which has a quadrant-rack 32, and the lever 18 is provided with a suitable detent 33, which may be engaged with any appropriate notch of the said quadrant-rack to lock said lever thereto.

The lever 18 is adapted to be operated manually, and the starting-engine 10 is in practice, preferably, a double engine, with its cranks at an angle to each other, so that it cannot stop at a dead-center. In Fig. 1 the lever 18 is shown in a vertical position parallel with the arm 22 and the segment-arm 8

to shift the link 12, so that the latter is in position to prevent the starting-engine 10 from operating. Said link 12 is connected to the slide 26 by a rod 34. To cause the engine 5 controlled by the link-motion 1 2 to be started in either direction, the lever 18 is moved manually in the appropriate direction and angularly with reference to the slide 26, thereby causing the tappet-rollers 29, which coact 10 with the cam-slots 24 of the arm 22, to raise or lower the slide 26, as the case may be. This starts the engine 10 in the appropriate direction. The gears 14, 15, and 17 and the segment-gear 8 are hence operated by the starting-engine 10 and cause the lever 3 to turn in an appropriate direction to shift the link 2, and hence start the engine controlled by the link-motion of which said link is a member in the direction required. The arm 9 turns with the 20 lever 3, and hence the rod 30, which connects the arm 9 with the arm 21, operates the latter, and causes the arm 22, which is movable angularly with reference to the lever 18, to also turn until it is again parallel with the lever 22 and segment-arm 8, thereby returning 25 the slide 26 to its initial position and causing the starting-engine to stop.

I do not desire to limit myself to the precise construction and combination of devices herein shown and described, as it is evident that modifications can be made therein without departing from the spirit of my invention and within the scope of the appended claims.

Having thus fully described my invention, 35 what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with a starting-engine and a reversing-gear therefor, a lever for the 40 the starting-engine, and connections between

the last-mentioned reversing-gear and that of the starting-engine, to automatically actuate the former, said connections including an element slidable longitudinally on the lever, and an element, movable angularly with reference 45 to the lever, and means to move the slidable element by the angularly-movable element.

2. In combination with a starting-engine and a reversing-gear therefor, a lever for the reversing-gear, a reversing-gear operated by 50 the starting-engine and connections between the last-mentioned reversing-gear and that of the starting-engine, to automatically actuate the former, said connections including a slide movable longitudinally on the lever and having 55 a stud, and a crank, mounted on the pivot of the lever for angular movement with reference to the lever and having a cam-slot engaged by the stud of the slide to actuate the latter. 60

3. In combination with a starting-engine and a reversing-gear therefor, a lever, a slide having a stud and movable longitudinally on the lever and also angularly therewith and connected to the reversing-gear of the starting-engine to shift said gear, a crank mounted 65 on the pivot of the lever, movable angularly with reference thereto and having a cam-slot engaged by the stud of the slide, a controlled engine reversing-gear, geared to and operated 70 by the starting-engine, and a connection between the controlled engine reversing-gear and the crank, to move the latter angularly.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses. 75

CHARLES F. SAYLOR.

Witnesses:

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W. N. FORD.