No. 774,062. PATENTED NOV. 1, 1904.

F. W. GASKIN.

STEAM ENGINE.

APPLICATION FILED SEPT. 12, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

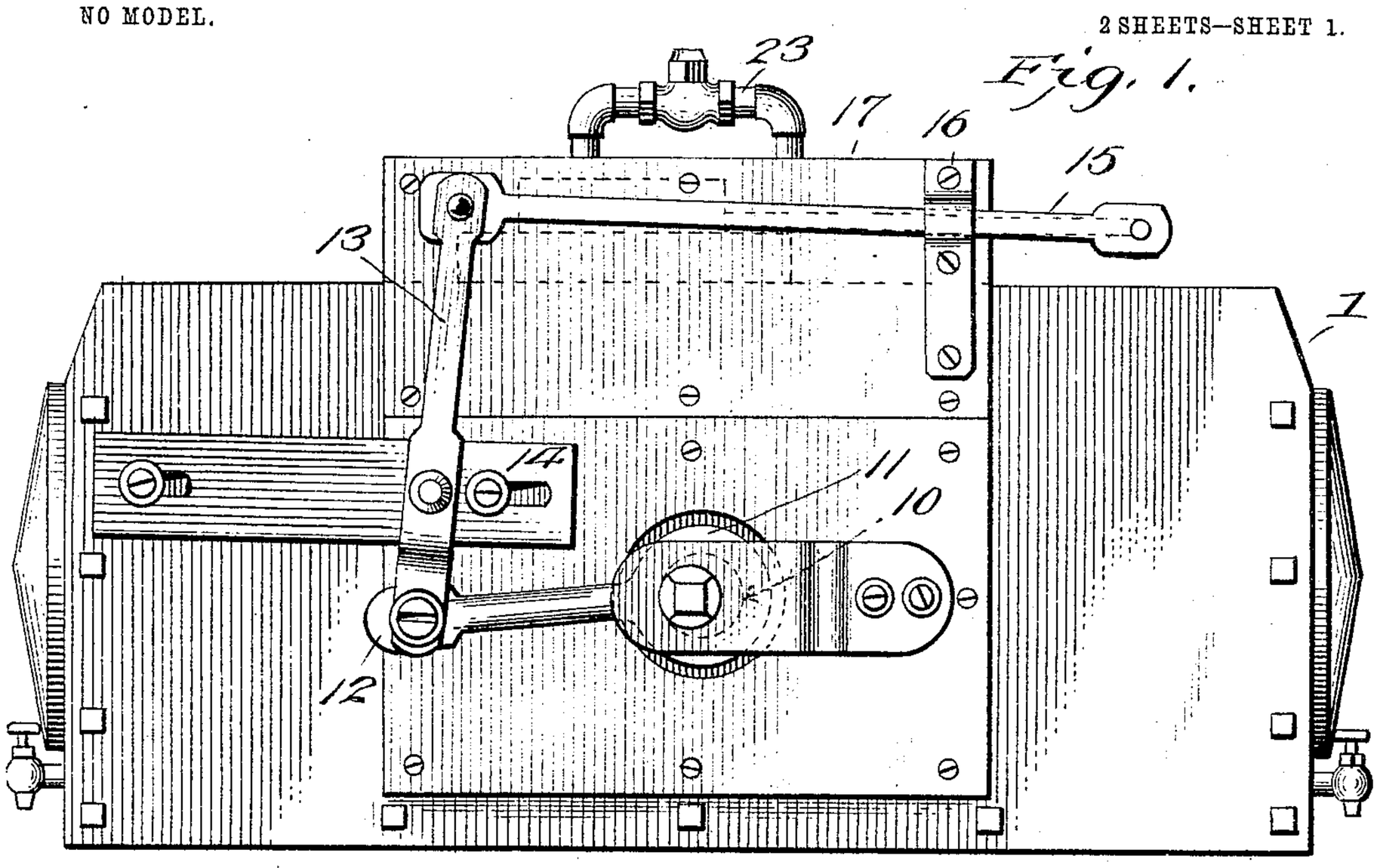
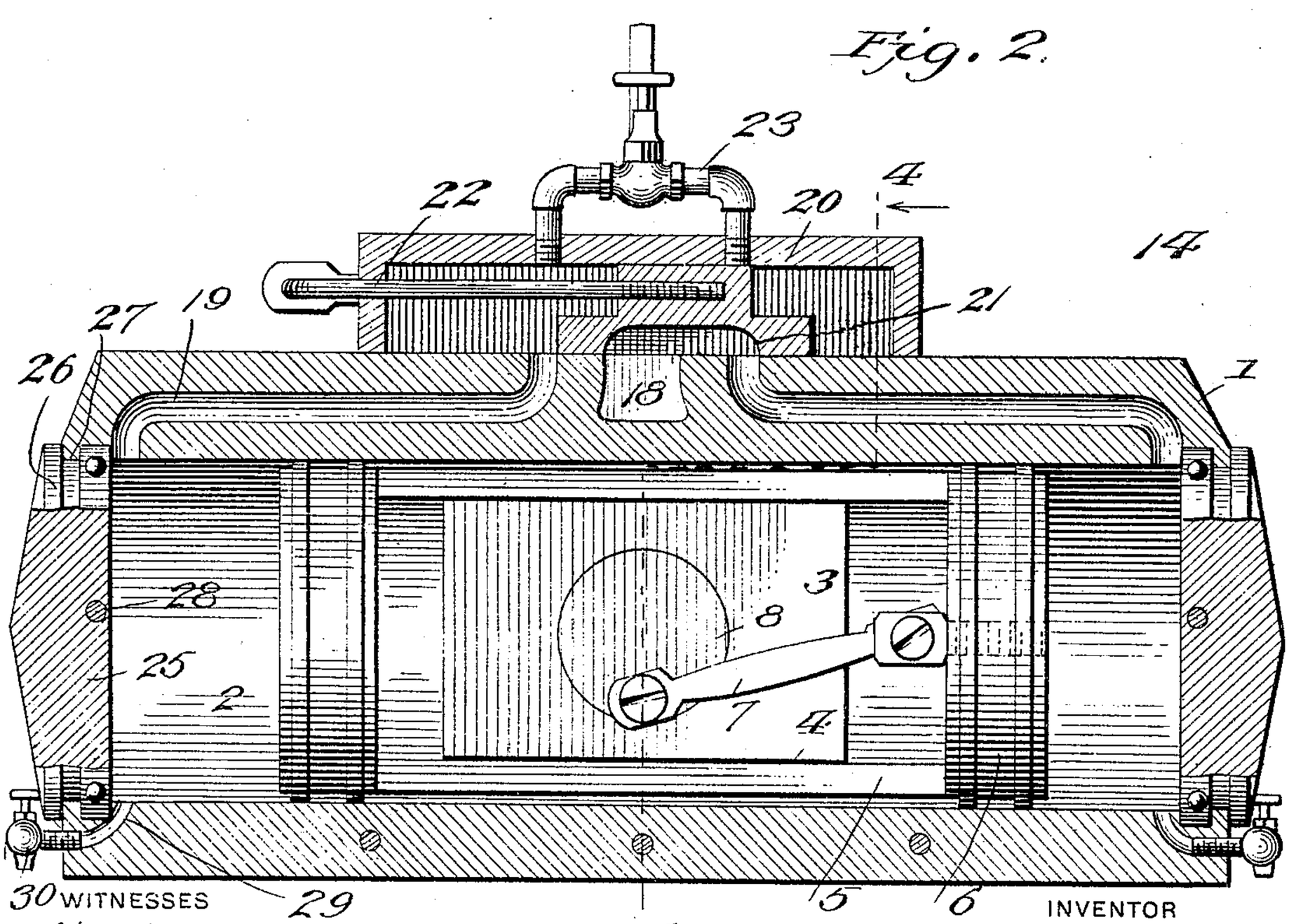


Fig. 2.



WITNESSES

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 4.

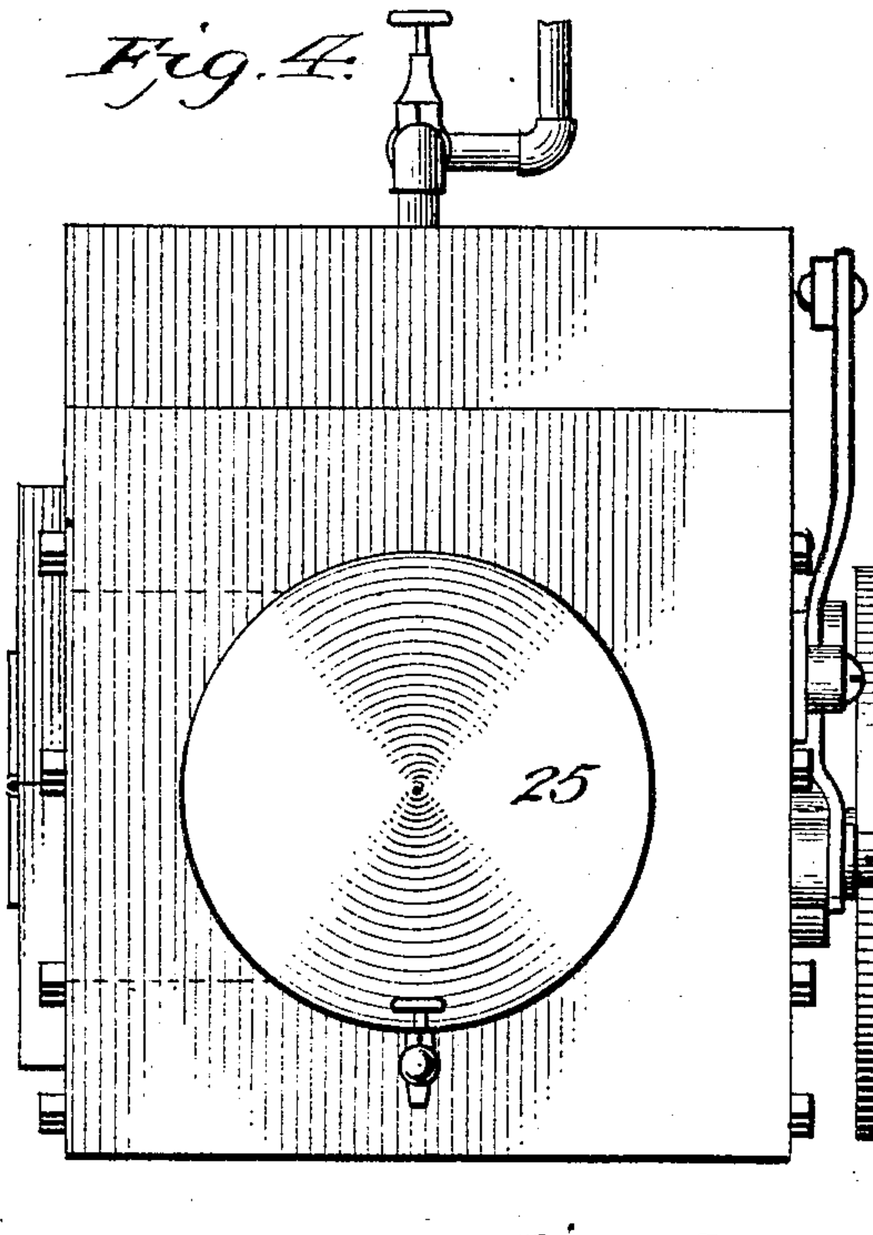


Fig. 5.

Fig. 3.

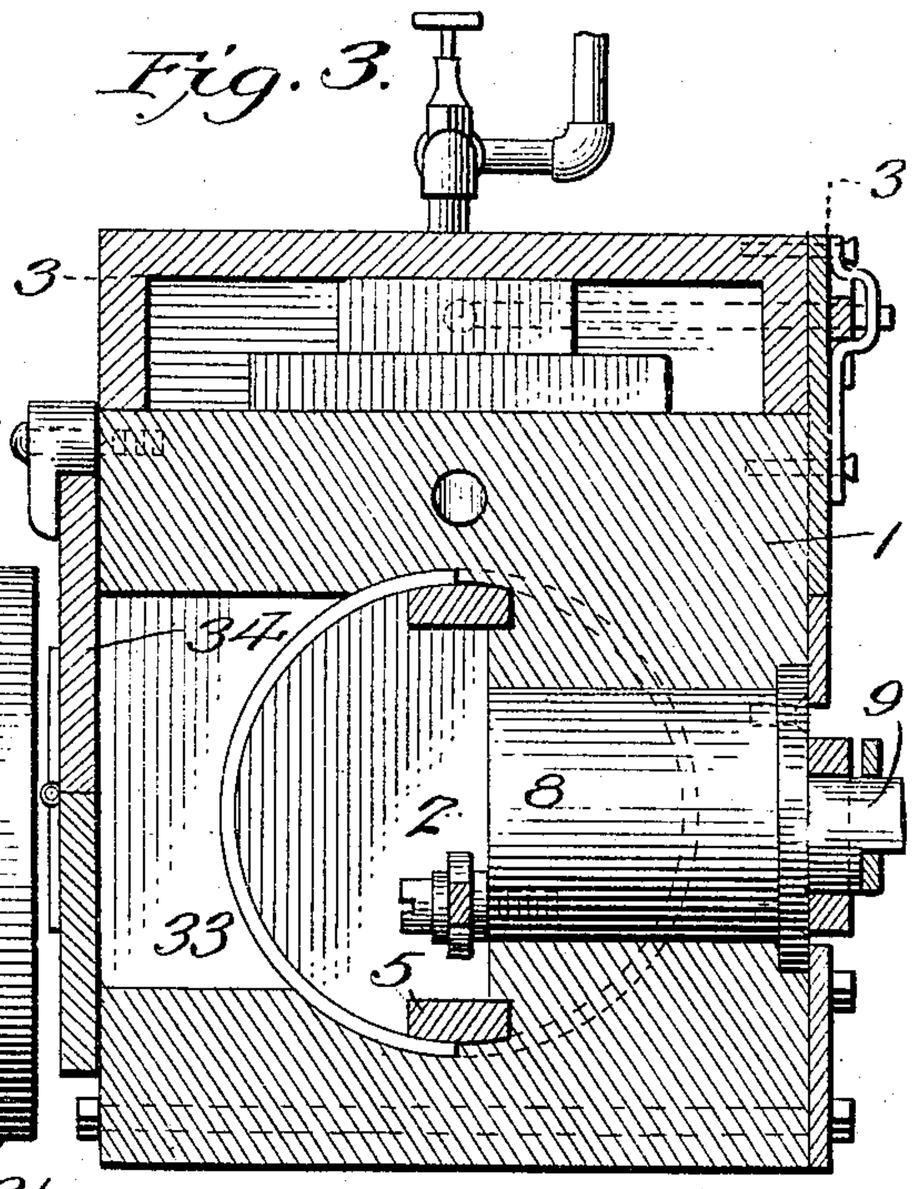
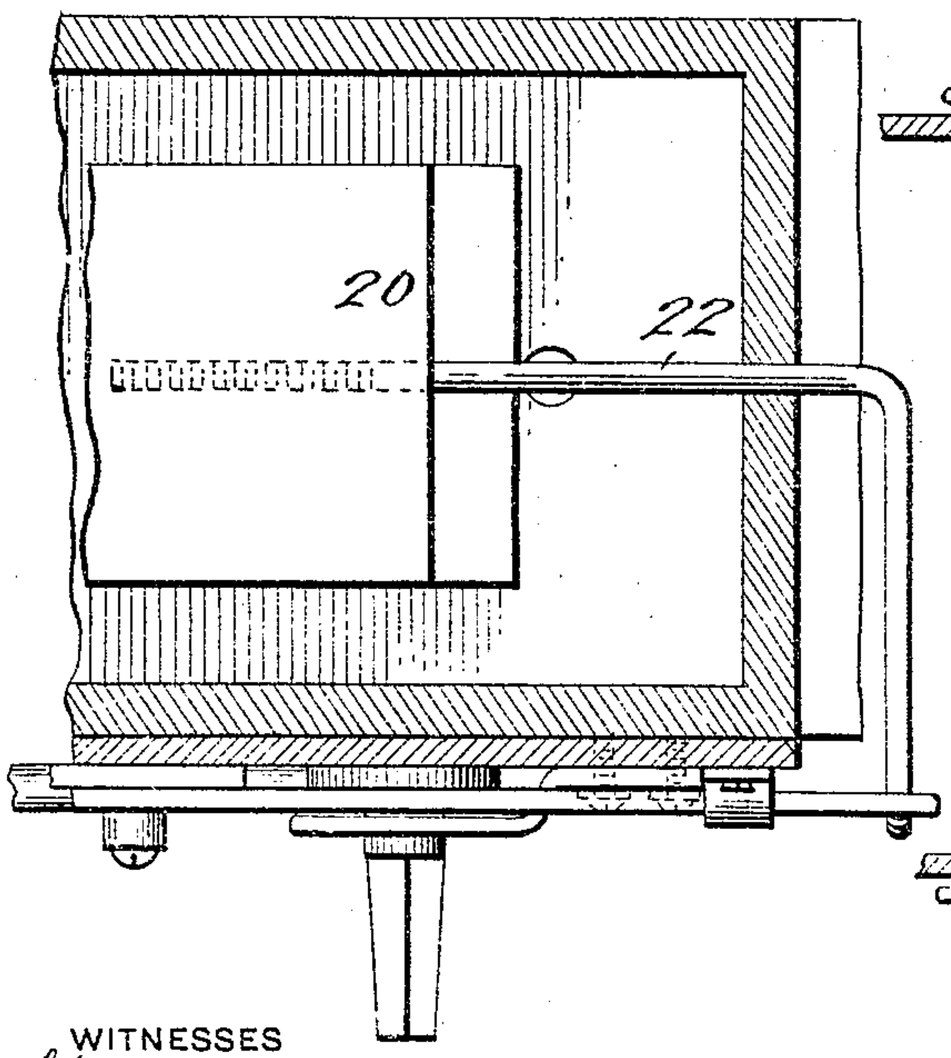
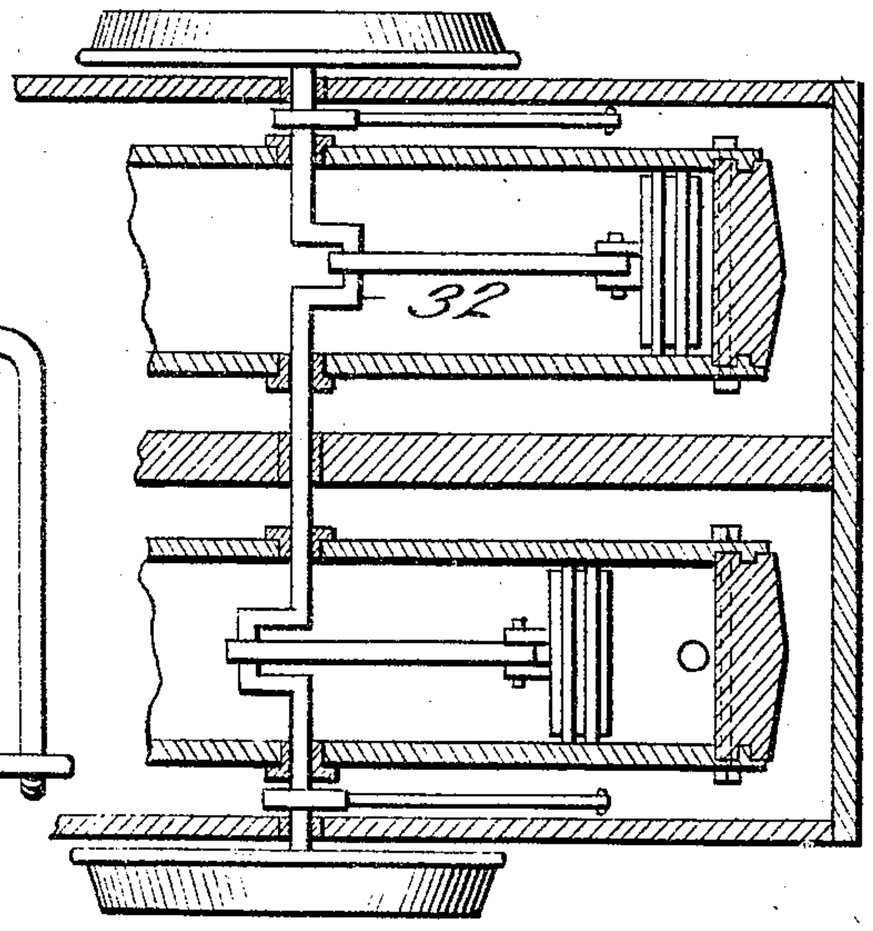


Fig. 6.





WITNESSES

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No. 774,062. Patented November 1, 1904.

UNITED STATES PATENT OFFICE.

FRANK W. GASKIN, OF HUTCHINSON, KANSAS.

STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 774,062, dated November 1, 1904.

Application filed September 12, 1903. Serial No. 172,981. (No model.)

To all whom it may concern:

Be it known that I, FRANK W. GASKIN, a citizen of the United States, residing at Hutchinson, in the county of Reno and State of Kansas, have invented new and useful Improvements in Steam-Engines, of which the following is a specification.

My invention relates to new and useful improvements in steam-engines; and its object is to provide an engine of simple construction the working parts of which are inclosed and rendered dust-proof.

A further object is to provide an engine which dispenses with the use of the ordinary piston-rod usually employed in connection with engines of this character.

Another object is to provide novel means for operating the valve automatically, so as to direct the motive fluid to opposite ends of the cylinder alternately.

With the above and other objects in view the invention consists in the further novel construction, combination, and arrangement of parts hereinafter more fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation with the fly-wheel removed. Fig. 2 is a central vertical longitudinal section therethrough. Fig. 3 is an end elevation. Fig. 4 is a section on line 4 4, Fig. 2. Fig. 5 is a horizontal section through a portion of the valve-casing and showing the slide-valve in end view, and Fig. 6 is a section showing diagrammatically the manner of connecting engines of this character to the axles of a locomotive or other motor-car.

Referring to the figures by numerals of reference, 1 is a casing having a cylindrical compartment 2 therein, into one side of which projects a semicylindrical block 3, having grooves 4 at its upper and lower edges for the reception of bars 5, which are slidably mounted therein. These bars are connected in any suitable manner at their ends to pistons 6, which are arranged at opposite ends of the block 3 and move in unison backward and forward within the casing. One of the pistons is connected, by means of the arm 7, with a disk 8, which is revolubly mounted within the block 3 and is secured to a shaft 9, projecting from one side of the casing 1. A cam 10 is secured to shaft 9 and is inclosed by a strap 11, having an arm 12 pivotally connected to one end of a lever 13. This lever is fulcrumed at a point between its ends upon a plate 14, and the other end of the lever is pivoted to a rod 15, slidably mounted within a bracket 16, secured to one side of a valve-casing 17, arranged upon the casing 1. An exhaust-port 18 is arranged at the bottom of the valve-casing at the center thereof, and at either side of this exhaust-port is an inlet-port 19, the two ports opening into the compartment 2 at opposite ends thereof.

The slide-valve 20 within casing 17 is recessed in its lower surface, as shown at 21, and this recessed portion is at all times in position over the exhaust-port 18 and is adapted to be moved also into position over either one of the inlet-ports 19. A rod 22 is secured to the slide-valve and the rod 15, respectively, and it is obvious that as the cam 10 rotates a reciprocating motion will be transmitted through the lever 13 and rod 15 to rod 22 and the valve 20, and the valve will be moved backward and forward within the casing 17, so as to alternately direct steam from the ports 19 to the exhaust-port 18. The valve 20 is of such size as to leave one of the ports 19 normally exposed, so as to permit steam to enter it from the valve-casing 17. Steam is admitted to this casing from inlet-pipes 23, which open thereinto adjacent the ends thereof.

The cylindrical heads 25 of the casing 1 are preferably provided with annular grooves 26 for the reception of beads 27, formed upon the inner walls of the chamber 2 at the ends thereof, and bolts 28 extend transversely through the heads and the casing 1 and serve to hold the same together. With this construction it will be understood that excessive strain upon the heads is not borne solely by the bolts, but is equalized between them and the beads 27 of the casing 1. Any suitable arrangement of drains 29 may be provided for the chamber 2, and each of these may have a valve 30, as shown.

In operation steam is admitted to the valve-

casing 17 and passes directly into the exposed port 19 and thence to the chamber 2 and in rear of the adjoining piston 6. This piston will be moved longitudinally within the casing, and as it is connected, by means of rods 5, with the opposite similar piston it will be understood that both pistons will be moved in unison, and any gases contained in the path of the pistons will be forced outward through the other port 19 and into the recess 21 to the outlet-port 18. During the completion of this work of the pistons the cam 10 imparts a longitudinal movement to its arm 12, and the lever 13 is thus reciprocated and through the rods 15 and 22 changes the position of the valve, so as to bring the exposed port 19 into communication with the outlet-port. The steam will thus be directed to the other end of the casing, and the movement of the pistons will be reversed.

The shaft 9 is preferably so arranged as to permit a fly-wheel 31 to be attached thereto, so that the same will be rotated when rotary motion is transmitted to the disk 8 from the pistons 6 through the arm 7. If desired, and as shown in Fig. 6, the axle 9 may extend through the casing and be provided with cranks 32 instead of disks 8, and this shaft may serve the purposes of the axle of a locomotive or other motive vehicle. Moreover, in lieu of providing two pistons within the casing one may be used, as shown in said figure; but in this case two engines are preferably employed, so as to prevent the apparatus from coming to a dead-center.

In order that access may be readily had to the interior of the casing, an aperture 33 is preferably formed in one side thereof, and directly opposite the disk 8 this aperture is adapted to be closed by means of removable plates 34, which may be fastened in position in any suitable manner.

It will be understood that the block 3 serves to guide the bars 5, and thereby prevents the pistons from rotating within the casing.

In the foregoing description I have shown the preferred form of my invention; but I do not limit myself thereto, as I am aware that modifications may be made therein without departing from the spirit or sacrificing the advantages thereof, and I therefore reserve the right to make such changes and alterations as may fairly fall within the scope of my invention.

Having thus fully described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. The combination with a casing having a grooved block centrally disposed therein, of oppositely-arranged pistons within the casing, bars connecting the pistons and slidably mounted within the grooved block, a revoluble disk within the casing, an arm pivoted thereto and to one of the pistons, a shaft revoluble with the disk, and means operated by the shaft for directing motive fluid to opposite ends of the casing alternately.

2. The combination with a casing having a centrally-arranged longitudinally-grooved block therein, of pistons within the casing, bars connecting the pistons and slidably mounted within the grooved block, a disk movably mounted within the casing, an arm connecting the disk and one of the pistons, a shaft revoluble with the disk, an eccentric thereon, a slide-valve, means connecting the valve and eccentric.

3. The combination with a casing having a longitudinally-grooved block centrally arranged therein, of oppositely-disposed pistons within the casing, bars connecting the pistons and slidably mounted within the block, a valve-casing, a slide-valve therein adapted when reciprocated to direct motive fluid from the casing to either end of the casing and to establish communication between the opposite end of the casing and exhaust, a disk revolubly mounted within the casing, an arm connecting the disk and one of the pistons, a shaft revoluble within the disk, an eccentric thereon, a lever having a movable fulcrum and operated by the eccentric, and rods connecting the lever and valve.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK W. GASKIN.

Witnesses:

BELLE LOW,

A. SNYDER.