

(No Model.)

2 Sheets—Sheet 1.

R. GARSTANG.
STEAM ENGINE.

No. 523,631.

Patented July 24, 1894.

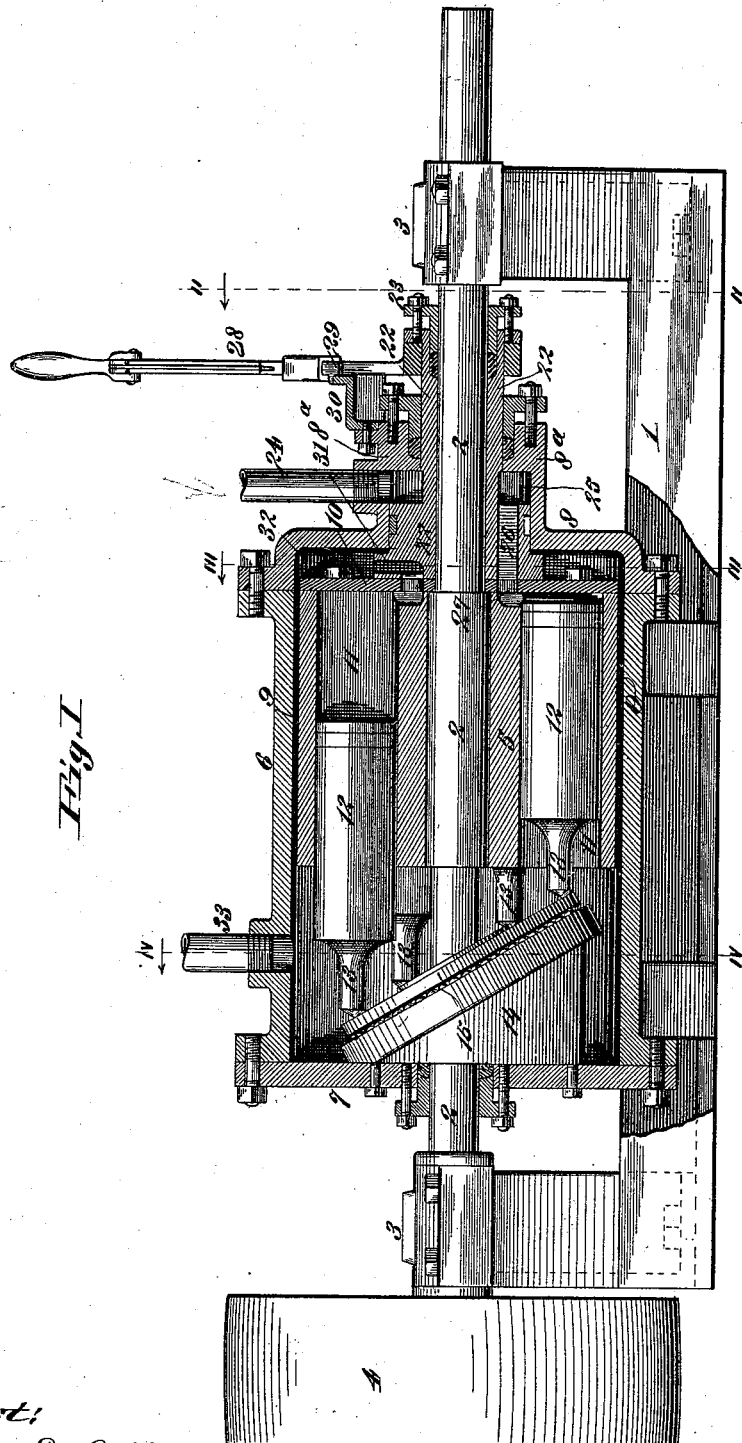


Fig. 1

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Inventor,
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attys

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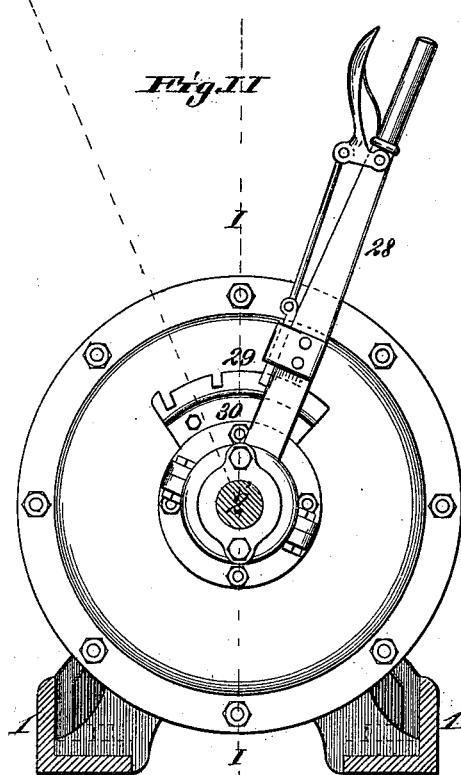


Fig. III.

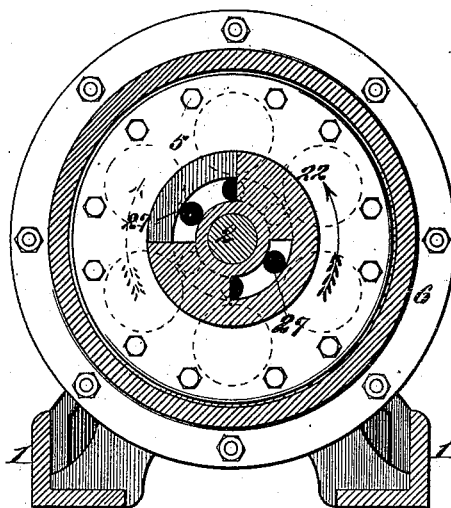


Fig. IV.

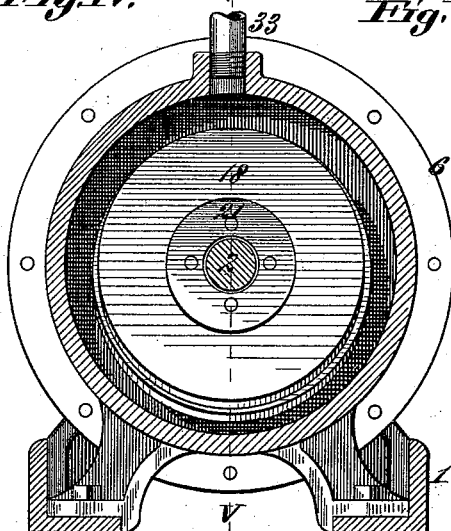
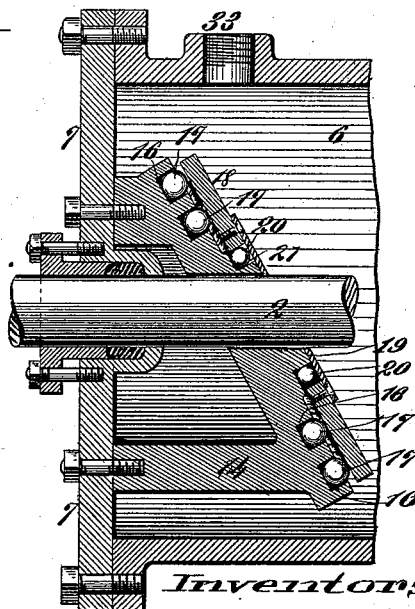


Fig. V.



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UNITED STATES PATENT OFFICE.

RICHARD GARSTANG, OF ALTON, ILLINOIS, ASSIGNOR OF TWO-THIRDS TO CHARLES F. SPARKS AND THE ALTON NOVELTY MANUFACTURING COMPANY, OF SAME PLACE.

STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 523,631, dated July 24, 1894.

Application filed September 10, 1892. Serial No. 445,560. (No model.)

To all whom it may concern:

Be it known that I, RICHARD GARSTANG, of Alton, in the county of Madison and State of Illinois, have invented a certain new and useful Improvement in Steam-Engines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to an improved construction of engines, whereby a direct, rotary movement is imparted to the shaft by a longitudinal movement of a plurality of pistons.

My invention consists in features of novelty hereinafter fully described and pointed out in the claim.

Figure I is a vertical, longitudinal section of my improved engine, taken on line I—I, Fig. II. Fig. II is a transverse section, taken on line II—II, Fig. I. Fig. III is a similar view, taken on line III—III, Fig. I. Fig. IV is a similar view, taken on line IV—IV, Fig. I. Fig. V is an enlarged, detail, longitudinal section, taken on line V—V, Fig. IV.

Referring to the drawings, 1 represents a suitable bed-plate, to which the main shaft 2 is secured by journal boxes 3.

4 is the belt pulley secured to the shaft 2.

5 represents a cylinder rigidly secured to the shaft 2 within a jacket or housing 6 mounted on the bed-plate. The housing or jacket has heads 7 and 8, and there is a space 9 between it and the cylinder 5. The cylinder has a head 10 at one end, and it has a plurality of bores 11, each receiving a piston 12. The outer end of each piston is preferably reduced, as shown at 13, and the extreme point of each end is preferably made conical, as shown.

14 represents a stationary block secured to the head 7 of the jacket or housing, and which has an inclined face 15, grooved at 16 to receive one or more series of rolls 17.

18 represents an anti-friction ring resting against the rolls 17, and between which and a shoulder 19 on the block 14 are placed friction rolls 20.

21 represents a plate secured to the ring 18, and which holds it concentrically on the shaft 2, and which also serves to hold the rolls 20 in place.

22 represents a valve mounted on the shaft 2, and which has a stuffing-box connection 23 with the shaft.

The head 8 of the jacket or housing has an extension 8^a with which connects the live steam pipe 24; the pipe communicating with an annular port 25, which in turn communicates with a port 26 in the valve 22, the port 26 communicating with an opening or port 27 in the head 10 of the cylinder; this latter port 27 communicating with the chambers or bores 11 in the cylinder.

28 represents a lever rigidly mounted on the valve 22 for moving the valve to reverse the engine; the lever having the usual pawl 29 which engages with a segment 30 secured to the neck 8^a of the head 8 of the jacket, and by which the lever is held to its adjustment.

31 represents the exhaust port in the valve 22, which communicates with an annular chamber 32 in the head 8 of the outer jacket, and through this port and chamber the exhaust steam passes to the escape pipe 33.

The operation is as follows:—Steam being turned on in the pipe 24, passes through the chamber 25, through the ports 26 and 27 into the chamber or bore 11, which is then opposite, or which then registers with the port 27. This produces a forward movement of the piston 12 in this chamber 11, and it, pressing against the inclined surface or ring 18, produces a rotary movement to the cylinder 5, which movement is transmitted to the shaft 2. The different bores or chambers in the cylinder are thus consecutively brought into communication with the live steam ports 26, 27, and consecutively impart pressure against the inclined ring 18 to revolve or turn the cylinder 5. As the pistons 12 reach the upper part of the inclined ring 18, their chambers or bores register with the exhaust port 31 and the steam escapes from behind the pistons, allowing them to recede to their inner positions until they are again brought opposite the live steam port, and then they are again forced forward as described.

I have shown the cylinder provided with six pistons, see dotted lines Fig. III, but three or more may be used, and I have shown the live steam and exhaust ports large enough so

that before communication with one of the chambers or bores 11 is cut off, communication is established with the next. It will thus be seen that, with a very cheap and durable
5 construction, I provide an engine in which the longitudinal or end movement of the pistons imparts a direct rotary movement to the main shaft.

I claim as my invention—

10 In an engine, the combination of a shaft, a

cylinder mounted on the shaft and provided with a plurality of pistons, an inclined, grooved, stationary block, an anti-friction ring, and one or more series of rolls placed between the block and the ring; substantially 15 as and for the purpose set forth.

RICHARD GARSTANG.

In presence of—

ALBERT M. EBERSOLE,

ED. S. KNIGHT.