

William M. Starr's
Improvement in Steam Engines

No. 118,401.

Patented Aug. 22, 1871.

Fig. 3.

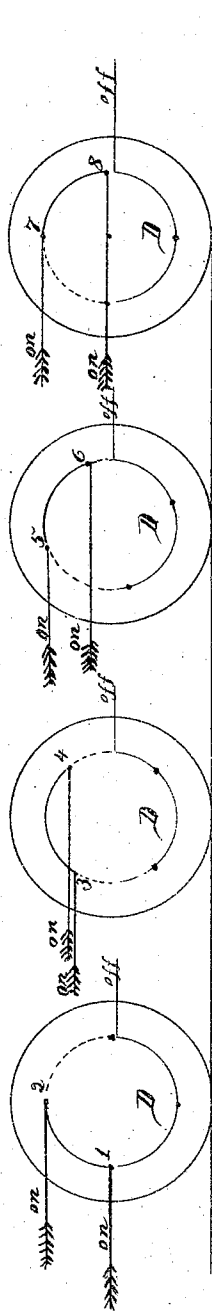
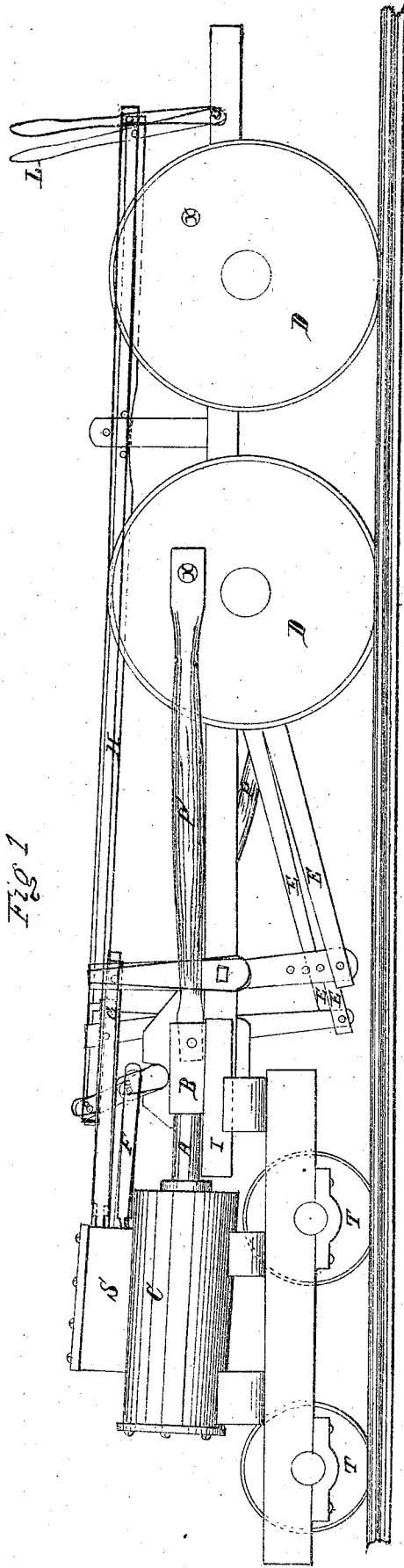


Fig. 1



Witnesses
Perman & Co.
Chas. B. Roane

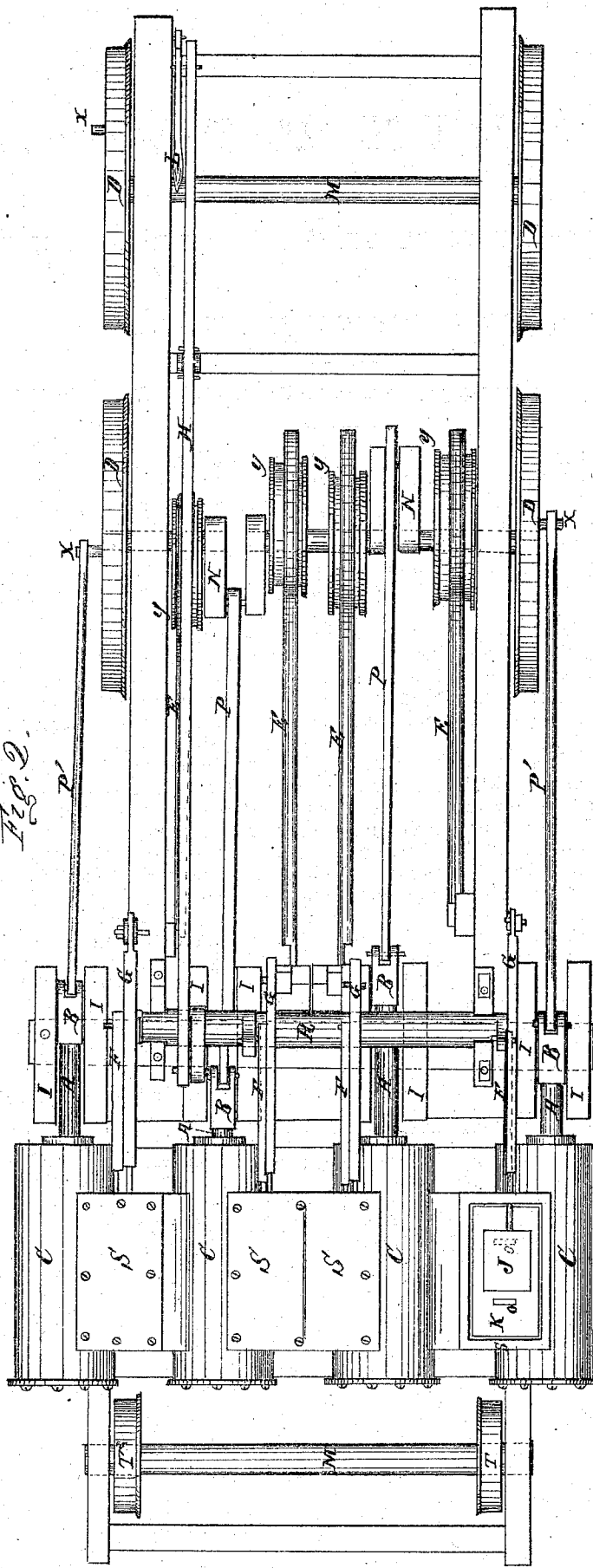
Inventor
Wm. M. Starr

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Fig. 2.



Witnesses
Samuel A. Ames
Samuel B. Boone

Inventor
Wm. M. Stearn

UNITED STATES PATENT OFFICE.

WILLIAM M. STARR, OF WASHINGTON, DISTRICT OF COLUMBIA.

IMPROVEMENT IN STEAM-ENGINES.

Specification forming part of Letters Patent No. 118,401, dated August 22, 1871.

To all whom it may concern:

Be it known that I, WILLIAM M. STARR, of the city of Washington, District of Columbia, have invented a new and useful Improvement in Steam-Engines, of which the following is a description, reference being had to the accompanying drawings and the letters of reference marked thereon.

In the accompanying drawings, Figure 1 is a side view of a steam-engine and truck with my improvements. Fig. 2 is a top view of the same. Fig. 3 is a diagram illustrating the successive strokes of the four engines upon the top of the driving-wheel.

My invention consists, first, in applying the steam to the upper part of the wheel; second, in always driving the piston forward or in the direction to be traveled; third, in employing four engines, so that the dead points of two of the engines will correspond to the live points of the others; and fourth, in an adjustable valve-seat.

In the application of my improvement the engines and truck may be of the ordinary construction for railroads, as seen in the drawings, where D represents the driving-wheels, and T the wheels of the engine-truck. Upon this truck I arrange four steam-cylinders, C, and steam-chests S, with all the usual devices and connections, as seen in Fig. 2. Two of the connecting-rods P are attached to cranks N, which are placed opposite each other, and two other connecting-rods, P', are attached to crank-pins X, and also set opposite each other and at points ninety degrees from the cranks N. By this arrangement the four connecting-rods will come successively to the top of the driving-wheel, and the steam is admitted to

each of the four pistons in succession, and when the corresponding connecting-rod passes the dead point toward the top of the wheel. This will be better understood by Fig. 3, where the arrows indicate the direction in which the wheels move, and the points of rotation when the steam is let on and shut off. By this arrangement I always have the full power of a stroke acting upon the top of a wheel or longest lever. I employ a movable valve-seat, J, Fig. 2, so that the engineer, by means of rod H, may change the position of this valve-seat, and thus admit the steam on either side of the piston, according to the direction you wish to travel.

It is not necessary to further describe the details of construction of my machine, as it will be well understood by engineers.

My improvements may be applied in various situations to either stationary or moving engines, on land and water. I prefer to use four engines, but more or less than four may be employed without departing from my invention.

Having thus described my invention, I claim—
The above-described combination of three or more steam-cylinders provided with valves, arranged to admit the steam and force the pistons only in the direction of travel, the pistons acting successively and entirely upon the upper part of the driving-wheel and in the same direction, and the steam being admitted wholly at one end of the cylinder when traveling one direction, and wholly at the opposite end when traveling in the opposite direction, substantially as set forth.

WILLIAM M. STARR.

Witnesses:

EDM. F. BROWN,
JNO. D. DEFREES,