

(No Model.)

3 Sheets—Sheet 1.

J. B. TARR.
STEAM FIRE ENGINE.

No. 568,379.

Patented Sept. 29, 1896.

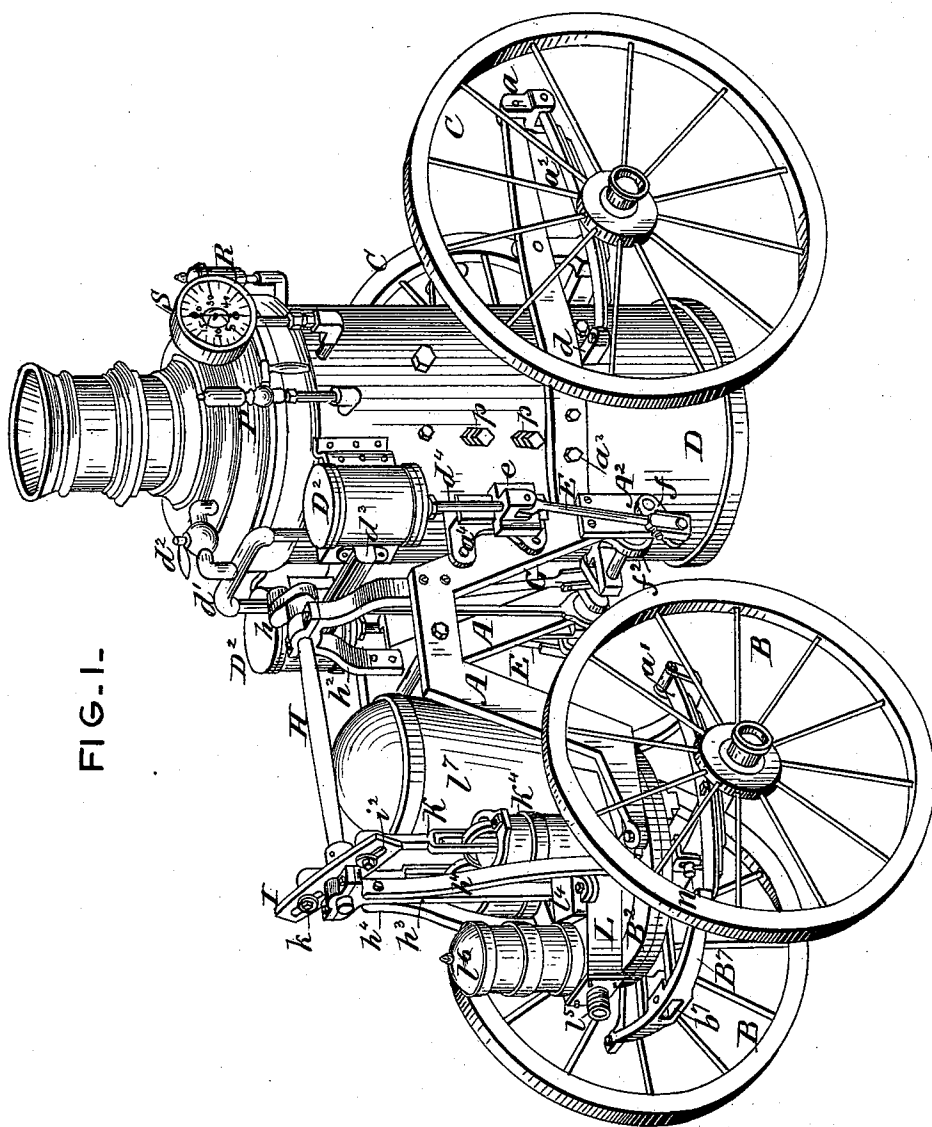


Fig. 1.

WITNESSES

A. B. DeGges
by D. Heinrichs

INVENTOR

John B. Tarr,
by E. E. Masson, Attorney.

(No Model.)

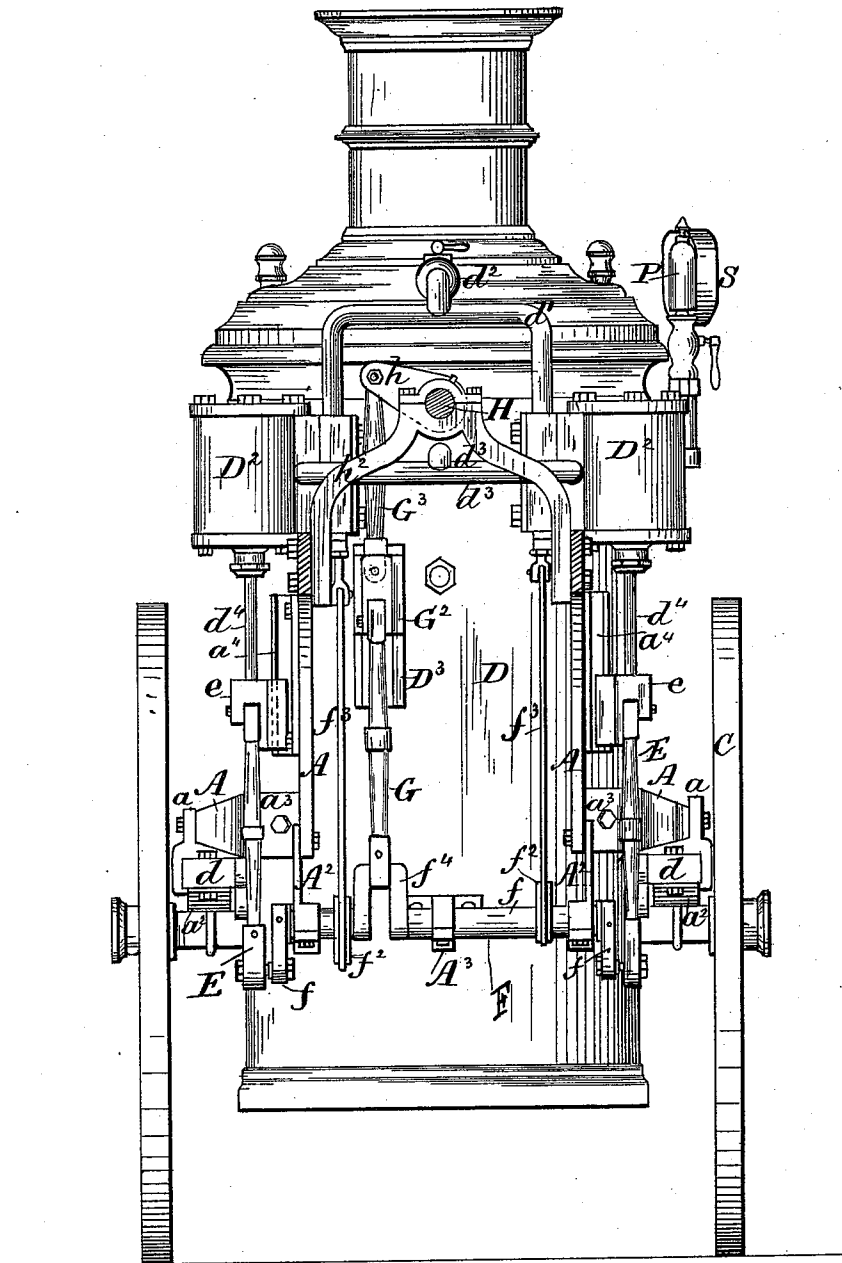
3 Sheets—Sheet 2.

J. B. TARR.
STEAM FIRE ENGINE.

No. 568,379.

Patented Sept. 29, 1896.

FIG. 2.



WITNESSES

A. B. Duggis
H. D. Heinrichs

INVENTOR

John B. Tarr,
by E. E. Masson, Attorney.

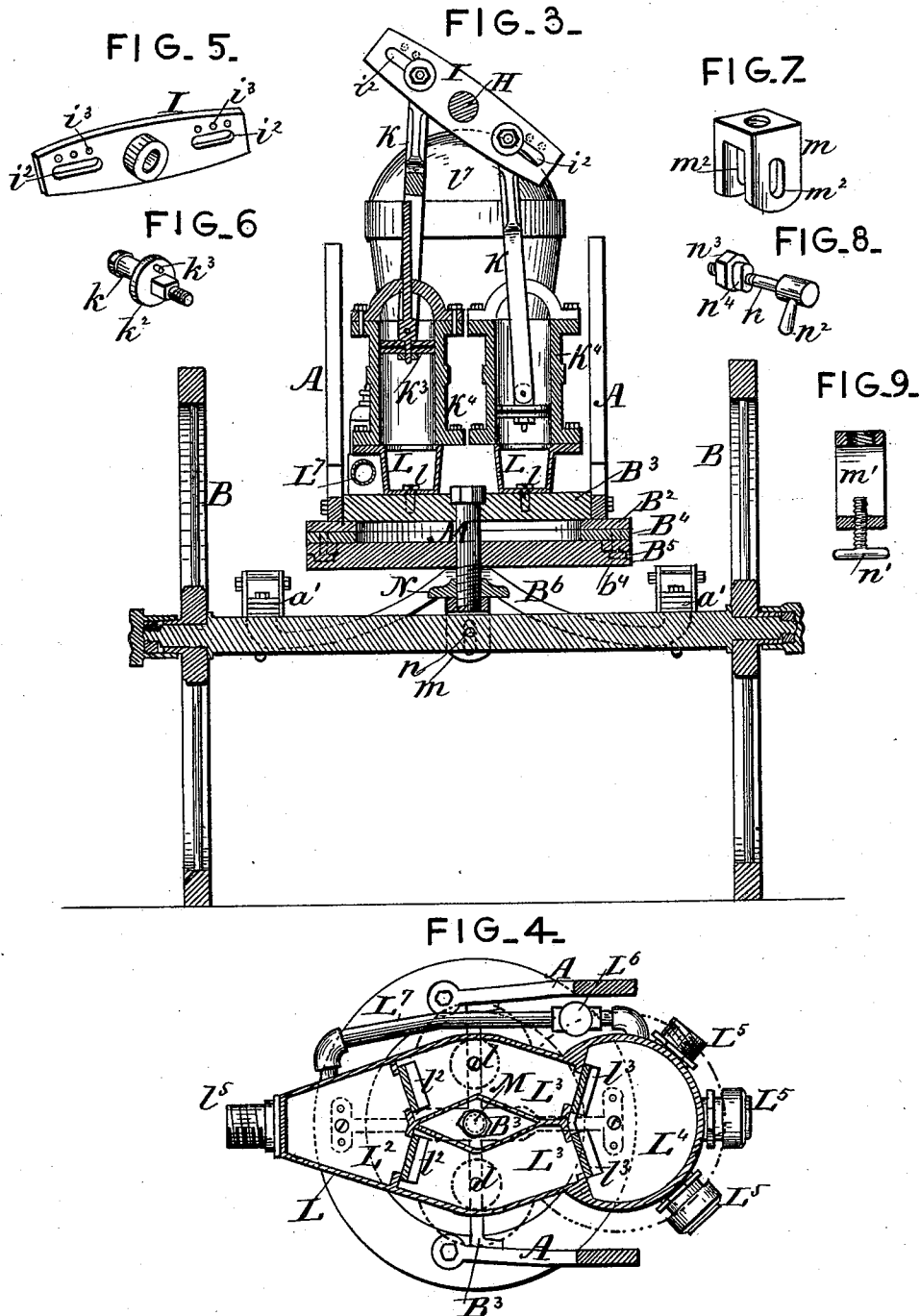
(No Model.)

3 Sheets—Sheet 3.

J. B. TARR.
STEAM FIRE ENGINE.

No. 568,379.

Patented Sept. 29, 1896.



WITNESSES

A. B. Degger
L. D. Heinrich

INVENTOR

John B. Tarr,
by E. E. Masson, Attorney.

UNITED STATES PATENT OFFICE.

JOHN BLAKE TARR, OF NEW BEDFORD, MASSACHUSETTS.

STEAM FIRE-ENGINE.

SPECIFICATION forming part of Letters Patent No. 568,379, dated September 29, 1896.

Application filed August 1, 1893. Serial No. 482,084. (No model.)

To all whom it may concern:

Be it known that I, JOHN BLAKE TARR, a citizen of the United States, residing at New Bedford, in the county of Bristol, State of Massachusetts, have invented certain new and useful Improvements in Steam Fire-Engines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 The objects of my improvement are, first, to provide a steam fire-engine of comparatively light weight, but having its pump-operating mechanism so adjustable as to permit it to force, when desired, one or more jets of
15 water over the highest buildings without materially increasing the pressure of steam within the boiler; second, to so locate the perpendicular force-pump relatively to the steam-engine thereof that the machine can be
20 turned within its length, although when in action there is no sensible shaking motion of the steam fire-engine, and thus chafing wear of hose is avoided, and the engine is capable of long service without repairs. I attain
25 these objects by the construction illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of a steam fire-engine constructed in accordance with my invention. Fig. 2 is a transverse vertical
30 section of the same, taken in front of the boiler and steam-engine thereof; the front truck and pump being removed. Fig. 3 is a transverse vertical section through the pump and through the axle of the front truck, showing the king-bolt thereof. Fig. 4 is a horizontal
35 section through the water-chamber under the pump. Fig. 5 is a perspective view of the brake-lever of the pump. Fig. 6 is a perspective view of one of the adjustable pivot-pins of the brake-lever. Fig. 7 is a perspective view of the king-bolt shackle. Fig. 8 is a perspective view of the clamping-bolt and nut for the shackle. Fig. 9 is a vertical
40 section through a modified form of king-bolt shackle.

45 In said drawings, A represents the frame, which consists of two flat bars standing on their edge and arched about the middle of their length to permit the wheels B of the front truck to pass thereunder, and thus turn the engine substantially in its own length in narrow streets. The fore ends of the frame

A rest upon and are bolted to the upper ring B² of the fifth-wheel, while the rear ends of said frame A are pivotally connected to clips 55 a, that rest upon and are attached to the rear end of leaf-springs a². The middle portion of said springs rest upon the rear axle of the machine, to which they are secured in any well-known manner. Said rear axle is carried by the rear wheels C of the engine. The front ends of the leaf-springs a² rest under and are bolted to lugs d, that are bolted to the sides of the boiler D. Said boiler is supported by the frame A by means of bolts a³, 65 passing through said frame and tapped into the boiler-shell.

To the sides of the boiler, adjacent to its top, are also secured the vertical steam-cylinders D² by means of suitable angle-plates. Steam 70 is conducted from the boiler to the steam-chest of the cylinders D² through the steam-pipe d', controlled by a valve d², suitably located. Steam exhausts from the steam-chest through the pipe d³ and is preferably conducted 75 thence into the smoke-stack of the boiler. Each cylinder D² is provided with a piston and piston-rod d⁴, the lower end of the latter being secured to a cross-head e, adapted to slide on a guide-plate a⁴, secured to the 80 frame A. To the lower portion of said frame are also secured the bearing-plates A² for the horizontal crank-shaft F of the steam-engine. Said shaft is supported in the middle of its length by a bearing-block A³, secured 85 to the boiler, and carries at each end thereof a crank f, whose crank-pin is received in the lower end of the connecting-rod E. The upper end of said rod is pivoted to the cross-head e, and transmits motion from the latter 90 to the crank-shaft F. Upon said crank-shaft are also mounted the eccentric f², provided with rods f³, to operate the valves in the steam-chest of each steam-cylinder.

To operate the double-cylinder pump of the 95 steam fire-engine, the crank-shaft F has formed thereon adjacent to its middle portion a crank f⁴, on which crank-pin is pivoted the lower end of a connecting-rod G. The upper end of said rod is pivoted to the lower 100 end of a cross-head G², that is adapted to slide vertically upon a guide-plate D³, secured to the boiler. To the upper portion of the same cross-head G² is pivoted the lower

end of a connecting-rod G^3 , that has its upper end made to receive the crank-pin of a crank h , that is mounted upon the rear end of a horizontal shaft H , used to oscillate the brake-lever I of the pump. In this construction the cross-head G^2 unites and moves up and down with the connecting-rods G and G^3 , although the connecting-rod G oscillates also at the same time in a direction fore and aft of the machine, while the rod G^3 oscillates transversely of said machine. The rear portion of the shaft H is carried in a bearing having two laterally-diverging branches h^2 , secured to the arched top of the frame A , while the fore end of said shaft is carried in a bearing mounted on top of a standard h^3 , resting upon a cross-frame B^3 , that rests upon and is fastened to the upper ring B^2 of the fifth-wheel, and also the lower portion of the frame A . To the sides of the standard h^3 divergent braces h^4 are secured, that have their lower ends bolted to the upper ring B^2 of the fifth-wheel.

Upon the front portion of the shaft H is mounted a double crank or brake lever I , having two slots i^2 lengthwise thereof. Each slot receives adjustably therein a crank-pin k , upon which is mounted the connecting-rod K of the piston-rod K^2 of the piston K^3 of the pump. To retain each crank-pin k positively in any position that it may be set within the slot i^2 , said pin is provided with a collar k^2 to bear against one side of the brake-lever, while a loose collar and nut bear against the opposite side. Projecting from the inner face of the collar k^2 there is a pin k^3 , that is adapted to be received in any one of a series of holes i^3 , made part way into the lever I above or under each slot i^2 . The pin k is flattened at the point where it engages with the slot i^2 to prevent it from rotating under the impulse of the connecting-rod K . Each piston K^3 is received in a pump-barrel or water-cylinder K^4 . Said cylinders are open at both ends and are resting upon and secured to a water-chamber L , and the latter is mounted upon and secured to the cross-frame B^3 by means of screws l , passing through the bottom of said chamber and into the cross-frame. The water-chamber is divided into four parts by means of vacuum-valves l^2 and pressure-valves l^3 . Said valves are flap-valves of ordinary construction, preferably rectangular, and set inclined at an angle of nearly forty-five degrees. The vacuum-valves are covered by removable cap-plates l^4 , so as to be easily reached when desired.

The four spaces within the water-chamber are the vacuum-space L^2 , adjacent to the suction-hose l^5 and on top of which the vacuum air-chamber l^6 is mounted, the two pump-chambers L^3 under the pump-barrels and the water-pressure chamber L^4 , on top of which the pressure air-chamber l^7 is mounted. In the sides of the chamber L^4 are three nozzles or hose-couplings L^5 , to which leading-hose can be coupled. The chamber L^4 is also in

communication at times with the chamber L^2 by means of the side pipe L^7 , that carries the relief-valve L^6 , as usual, in steam fire-engines.

The upper ring B^2 of the fifth-wheel rests upon the ring B^4 of the front truck. Said ring B^4 rests upon a cross-shaped frame B^5 , that has on the sides of each arm two perforated lugs to receive screws b^4 to secure it to the ring B^4 . To the rear arm of the frame B^5 , on the under side thereof, is secured an arched bar B^6 , the outer ends of which are suspended from the rear ends of leaf-springs a' by means of links, as usual. The front ends of said springs a' are secured to the under side of a bowed bar B^7 in front of the ring B^4 , and properly braced and secured to the latter. Said bar B^7 has in its center a rectangular perforation b^7 to receive the tongue of the machine.

The two rings B^2 B^4 of the fifth-wheel are retained in proper relative position by means of the king-bolt M , the square or polygonal head of which is received, in part, in the frame B^3 . Said bolt passes through said frame and through the center of the frame B^5 and extends below the latter. Its lower portion is screw-threaded and made to engage with the screw-tapped hole in the top of the shackle m , the branches of which straddle the axle carried by the front wheels B . The shackle m is adjustably clamped to the axle by means of a small bolt n , preferably passing through a horizontal perforation in the axle and through vertical slots m^2 in said shackle. The head of the bolt is provided with a handle n^2 to easily rotate it. Upon said bolt is placed a nut n^3 , having a flat boss n^4 , that is received within one of the slots m^2 , and thus kept from rotating, while the bolt is rotated. When the engine is going to a fire or returning therefrom, it is proper that its weight should rest on the springs thereof, and for this purpose the shackle m is left free to move up and down over the axle by slackening the bolt n , but while the engine and pump are working it is best that they should be free of oscillation and that they rest upon the axle. This is accomplished in part by tightening the shackle on the axle by means of the bolt n , but to prevent the fifth-wheel and its frames B^3 B^5 from playing up and down upon the king-bolt a nut N , preferably provided with a rim of large diameter to be operated as a hand-wheel, is mounted upon the king-bolt between the shackle m and the bottom frame B^5 . When the engine is in operation, said nut N is run up on the king-bolt tightly against the under side of the frame B^3 , and the weight of the engine thus rests solidly upon the axle.

In the modified form of king-bolt shackle shown in Fig. 9 the slots for the clamping-bolt are dispensed with, and the clamping hand-screw n' is made to pass through the bottom of the shackle, so that its upper end can be forced against the under side of the axle.

The boiler is provided, as usual, with water-gages *p*, whistle *P*, steam-gage *S*, and safety-valve *R*.

Having now fully described my invention, I claim—

1. In a steam fire-engine the combination of a steam-boiler, two trucks carrying it, a pair of vertical pump-cylinders upon the front truck, pump-pistons, a brake-lever, a horizontal shaft, and a steam-engine to rock said shaft, said engine having a vertical cylinder, its piston connected with a horizontal crank-shaft, two connecting-rods and a crank unitingsaid crank-shaft with the brake-lever shaft, and a cross-head between said connecting-rods and uniting them substantially as described.

2. In a steam fire-engine the combination of a steam-boiler, wheels carrying it, a pair of vertical pump-cylinders upon the front truck, pump-pistons having the upper end of their connecting-rods mounted upon pins $\frac{1}{2}$ having a collar provided with a projecting pin $\frac{1}{2}$, a slotted brake-lever having a series

of holes $\frac{1}{2}$ adjacent to its slots, a horizontal shaft carrying the brake-lever at one end and a crank at the other end, and a steam-engine connected with said crank to rock said shaft substantially as described.

3. In a steam fire-engine the combination of the front truck thereof, a pair of vertical pump-cylinders upon said front truck, a horizontal frame B^3 having the upper ring of the fifth-wheel attached thereto, the horizontal frame B^5 carrying the lower ring of said fifth-wheel, the king-bolt passing through said frames B^3 B^5 , a shackle in engagement with the screw-threaded lower end of the king-bolt, a clamping-bolt passing through the shackle, and a hand-nut upon the king-bolt, and located above said shackle substantially as described.

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

JOHN BLAKE TARR.

Witnesses:

E. E. MASSON,
A. B. DEGGES.