

3 Sheets—Sheet 1.

HAND FIRE ENGINE.

Patented Dec. 1, 1896.

[illegible]

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Inventors

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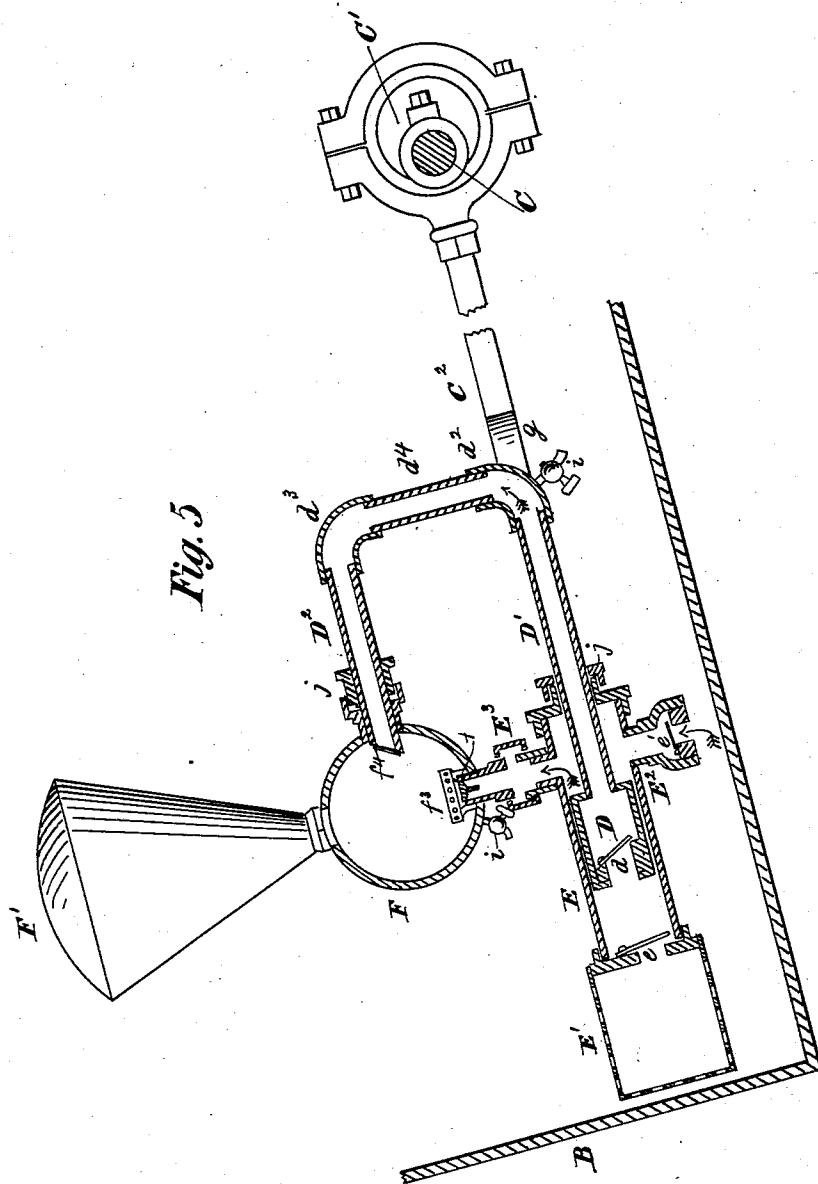
(No Model.)

3 Sheets—Sheet 3.

H. C. ATKINSON & W. MILLER.
HAND FIRE ENGINE.

No. 572,096.

Patented Dec. 1, 1896.



Witnesses

Frank Pardon

Harry C. Packer

Henry C. Atkinson
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Inventor *v*

By Attorney

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UNITED STATES PATENT OFFICE.

HENRY C. ATKINSON AND WILLIAM MILLER, OF LOUISVILLE, KENTUCKY.

HAND FIRE-ENGINE.

SPECIFICATION forming part of Letters Patent No. 572,096, dated December 1, 1896.

Application filed October 23, 1895. Serial No. 566,620. (No model.)

To all whom it may concern:

Be it known that we, HENRY C. ATKINSON and WILLIAM MILLER, citizens of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Hand Fire-Engines; and we do hereby 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.

The object of our invention is to provide a convenient machine for extinguishing fires in villages and towns of small population that are without waterworks and are unable to maintain a regular fire department.

Our invention is an improvement on the hand fire-engine for which a patent was granted to us by Letters Patent No. 547,871, dated October 15, 1895; and it consists in certain changes and modifications in the machine therein described, adapted to simplify and increase the efficiency of its working, as hereinafter explained, illustrated in the drawings, and specifically set forth in the claims.

In the drawings, Figure 1 is a side elevation of our improved fire-engine in position to move. Fig. 2 is a top plan view of the engine in position to move. Fig. 3 is a side elevation of engine in position for working. Fig. 4 is a top plan view of reservoir, showing the receiving-pipe, air-chamber eccentrics and cranks in position, and the hood for the eccentrics thrown back. Fig. 5 is a vertical sectional view of one of the cylinders, the receiving-pipe, and the piston and piston-rod and axle for the eccentrics and driving-wheel, and of the air-chamber and one of the eccentrics in perspective.

Similar letters refer to similar parts throughout the several drawings.

Our improvements on Patent No. 547,871 consist in dispensing with the gear-wheels and pinions and ungearing devices therein described and fixing the transporting-wheels of the engine on the outer ends of the axles carrying the eccentrics, in making the reservoir separate from the frame of the engine and adapting it to be lifted up like a buggy-top when the engine is to be moved, in changing the connections between the cylinders and piston-rods and the receiving-pipe, and

in certain additions and alterations which we will fully describe.

In the drawings, A represents the frame of the engine.

A' represents the shaft-gear of the engine, consisting of two parallel shafts bolted at their inner ends to the frame A, one on each side, and connected near their outer ends by a cross-bar.

A² represents a supporting-frame consisting of two side pieces at the same distance apart as the shafts, each hinged at its inner end to the front of the engine-frame under the shafts on each side connected by two cross-bars, one near the free ends and one near the hinged ends, and strengthened by iron brace-rods a⁵, bolted at one end to the middle part of the rear cross-bar and at the other to the side pieces near their outer end, as indicated in Fig. 2. This supporting-frame is adapted to be folded under the shafts, as shown in Fig. 1, when the engine is to be moved.

A³ is a platform constructed between the rear portions of the side sills of the engine-frame.

A⁴ represents a pair of ladders adapted to be inserted in a stirrup a, formed under the shafts A' near their outer ends, and a stirrup a', extending under the platform A³ toward the rear of the engine-frame.

a² is a stirrup on top of the shafts, near their outer end, adapted to hold the handle of an ax A⁵, and a³ is a stirrup on the side of the shafts toward their inner end, adapted to hold the blade of the ax.

a⁴ a⁴ represent hooks riveted to the lower surface of the outer cross-bar of the supporting-frame, adapted to engage a rung of each of the ladders and prevent them from being pulled out forward.

a⁶ represents brace-rods bolted to the top surface of the frame and shafts on each side and adapted to support a hose-reel B'.

a⁷ a⁷ represent curved and pointed pieces of iron riveted to the under surface of each side bar of the supporting-frame at their free ends and to each side sill of the engine-frame at their rear ends, adapted to give the engine a firm hold on the ground when it is in position to throw water.

a⁸ a⁸ a⁸ represent projecting ribs on the up-

per surface of the frame A, adapted to furnish bearings for the axles of the wheels and eccentrics.

a^9 represents a hood hinged to the frame, adapted to cover the axles and eccentrics when the engine is throwing water, and a^{10} represents projecting handles attached on the outside of each shaft of the hauling-frame A' and of each side bar of the supporting-frame A² and of each outer side piece of the ladders A⁴, adapted to furnish a hold for men hauling the engine.

B represents the reservoir, which in our improved engine we make of sheet metal, with a flat iron bar b , riveted to its back and side pieces just below the bead on their upper rims, bent upward at its free ends, with holes near the ends adapted to fit loosely over the ends of the axles between the frame and the wheels. The sides of the reservoir rise in height toward the rear sufficiently to make their top rims horizontal when the engine is in position for throwing water, as shown in Fig. 3. When it is desired to move the engine, the reservoir is lifted like a buggy-top by handles b' , bolted to the side bar b , and when raised is secured by pivoted handles b^2 on top of its sides, constructed with a bayonet-lock, to the axle of the hose-drum B', as shown in Fig. 1. In the bottom of the platform A³, near its inner end, are provided two circular holes, one on each side, each adapted to receive a nest of fire-buckets b^2 .

C C represent two axles, each having one bearing in one of the side ribs a^8 and one in the center rib a^8 . Each axle carries outside the frame, near its free end, a transporting and actuating wheel C³ and between its bearings two eccentrics C', oppositely arranged. The wheels C³ are each provided with a crank c , attached to the fellies and extending up in the plane of the spokes, adapted to furnish a handle for the man actuating the wheel and to be unfolded out of the way when the engine is prepared for movement, as shown in Fig. 1.

C² are the eccentric-rods, connected with the piston-rods D' by spade handles or forks g , held to the piston-rods by tap-bolts working in countersinks in lugs on the elbow-joints d^2 .

E is one of the series of pump-cylinders arranged side by side in the reservoir, having induction-valves e at their outer ends adapted to admit water through strainers E. They also receive water through a pipe E², provided with an induction-valve e' in their bottom near their crank ends.

F is a receiving-pipe arranged transversely above the cylinders, as shown in Fig. 4. The cylinders are connected with the receiving-pipe F, through an aperture near their crank ends, by union-joints E³, the upper nipples of which extend far enough into the pipe F to furnish a seat for a check-valve f , having a perforated cap f^3 .

D is the piston, which is hollowed and pro-

vided with an induction-valve d . The piston-rods D' are hollow and open at their lower end into the hollow piston D and at their upper end are connected with a parallel hollow rod D², which empties into the receiving-pipe F and is provided at its exit with a valve f^4 , by elbow-joints d^2 and d^3 and a pipe d^4 between those joints. Thus connected the hollow rod D² moves with the piston-rod.

F' is an air-chamber to regulate the out-flow, and in our improved engine we screw it into a threaded aperture in the top of the receiving-pipe instead of into the exit-pipe, as in the engine described in our former patent referred to.

f^2 is the exit-pipe, the free end of which is threaded to receive a hose-pipe, and f^5 are bracing-rods attaching the receiving-pipe F to the reservoir.

H is a pressure-gage placed on the top of the receiving-pipe.

$i i$ are drainage-cocks, and $j j$ are glands.

The pump-cylinders above described take water both at their ends through the valve e and at their bottom through the valve e' , and discharge into the receiving-pipe both through the union-joint E³ and the hollow piston and piston-rod.

When it is desired to move our engine, the arrangement of its parts is as shown in Figs. 1 and 2. The supporting-frame A² is held up against the shaft-gear A till the ladders are pushed into the stirrups a and a' , when the supporting-frame is allowed to rest on the ladders, the reservoir is lifted like a buggy-top and locked by the pivoted handle b to the axle of the hose-reel, and the nests of buckets are set in the apertures in the platform A³. The hooks a^4 on the front bar of the supporting-frame engage rungs of the ladders and prevent them from being pulled out of the stirrups, and the nests of buckets being between the rungs prevent them from being pushed back too far. The handles a^{10} furnish holds for the persons who pull the engine. When the engine reaches the place where it is to throw water, the nests of buckets are first removed, the reservoir is then lowered onto the platform, the supporting-frame is lifted till the rungs of the ladders are disengaged from its hooks, the ladders are withdrawn, the supporting-frame lowered, the reservoir is filled with water, and the hose withdrawn from the reel and attached. The arrangement by which each wheel and pair of eccentrics has its own axle enables one wheel to be worked at a time to actuate the pumps or one wheel to be turned in one direction and the other in the opposite direction at the same time and with the same effects as if both turned in the same direction. This enables the men at the wheels to rest themselves by changing from one hand to the other.

One of our ladders is furnished with a stirrup at one end and the other with rung-clasps at one end, adapting them to be joined to-

gether as one ladder if that length is required.

By means of the novel arrangement of valves in the pump-cylinder and hollow piston and the hollow piston-rod and its attachments the water thrown into the reservoir is conveniently and rapidly taken up and the effect of the air-chamber is to make the exit-stream regular.

10 Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a two-wheeled hand fire-engine, the combination with the engine-bed, nests of
15 buckets adapted to fit in apertures in the rear of the engine-bed, supporting-wheels, ladders adapted to form part of the hauling-gear and the hauling-shafts, of the supporting-frame hinged at its rear end and provided
20 with hooks to engage the ladder-rungs, the foot-pieces secured to the free end of said supporting-frame, devices for holding said frame and foot-pieces out of working position, and foot-pieces secured to the rear end of said
25 engine-bed, substantially as shown and for the purposes set forth.

2. In a two-wheeled hand fire-engine a water-reservoir pivoted in front on both sides to the axle of the supporting-wheels adapted to
30 be raised and lowered on said pivot and hav-

ing on the top of its sides pivoted handle-bars with a bayonet-lock, in combination with a hose-reel having an axle adapted to engage the lock of the pivoted handle and hold the reservoir in position substantially 35 as described.

3. In a hand fire-engine a series of pump-cylinders E having induction-valves *e* in their outer ends and strainers E' induction-valves *e'* in their bottom near their crank ends, ex- 40 haust-pipe in their tops, having a stem-valve *f* and a perforated valve-cap *f*³, near their crank ends, hollow valved piston-heads D, hollow piston-rods D', connected by elbow-joints *d*², pipes *d*⁴ and elbow-joints *d*³ with 45 hollow rod D² parallel with the piston-rod and having a valve *f*⁴ at its aperture, adapted to be actuated similarly with the piston-rod by the eccentric-rods C², in combination with a receiving-pipe F having a discharge-pipe *f*² 50 and an air-chamber *f*⁷ substantially as described and for the purposes specified.

In testimony whereof we affix our signatures in presence of two witnesses.

HENRY C. ATKINSON.
WILLIAM MILLER.

Witnesses:

FRANK DECKERT,
FRED HIRSCHFIELD.