(No Model.) 3 Sheets—Sheet 1.

M. E. HERSHEY.

ROAD ROLLER.

No. 456,567. Patented July 28, 1891.

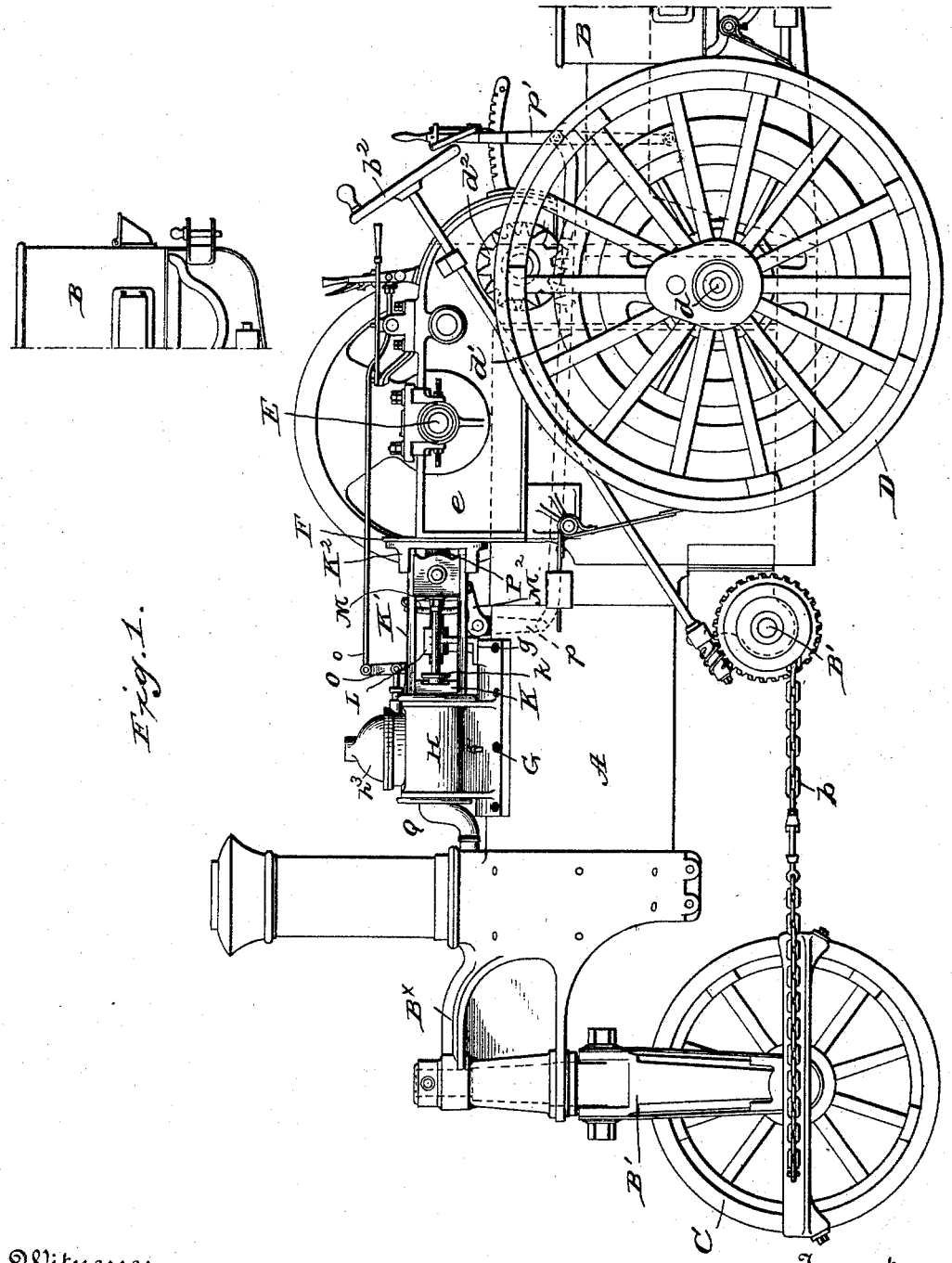

Fig. 1.

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(No Model.) 3 Sheets—Sheet 2.

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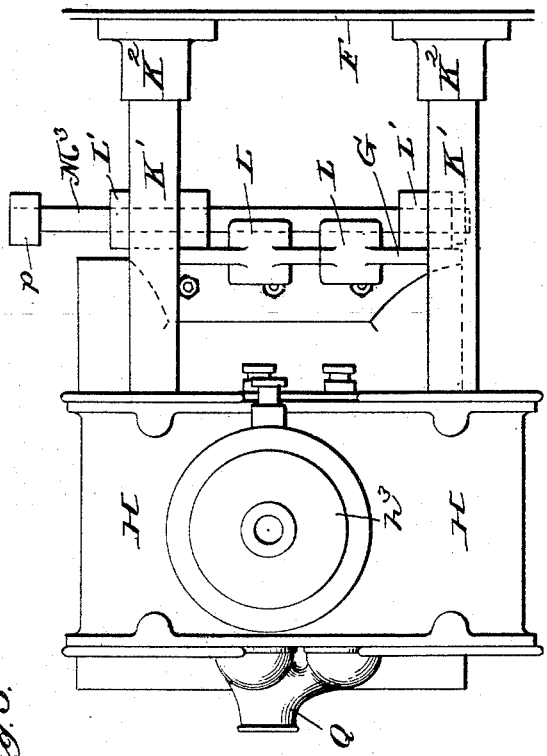

Fig. 3.

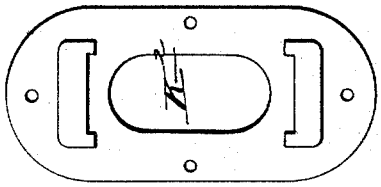

Fig. 6.

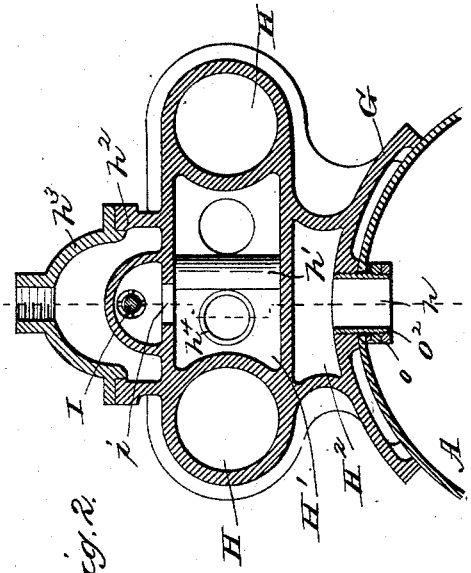

Fig. 2.

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(No Model.) 3 Sheets—Sheet 3.

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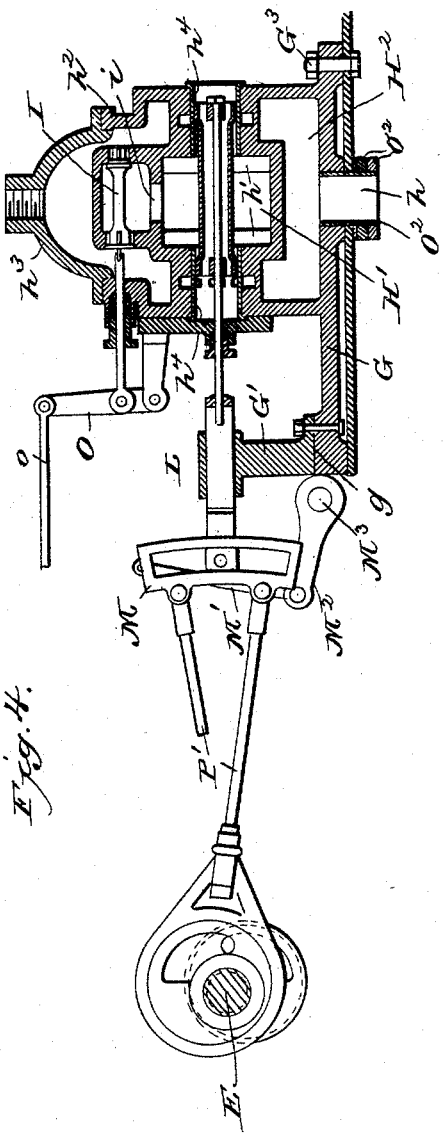

Fig. 4.

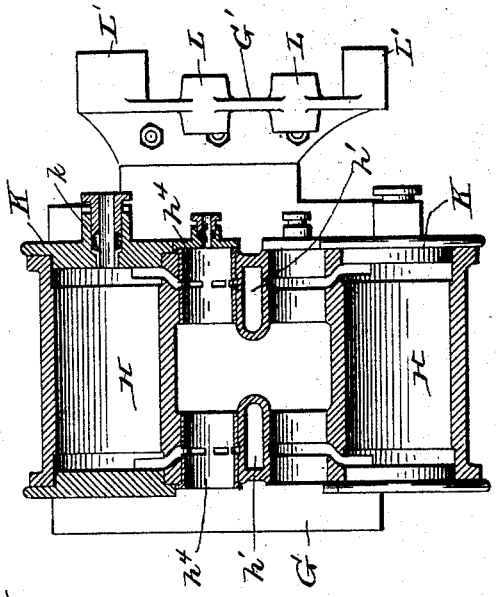

Fig. 5.

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UNITED STATES PATENT OFFICE.

MARTIN E. HERSHEY, OF HARRISBURG, PENNSYLVANIA.

ROAD-ROLLER.

SPECIFICATION forming part of Letters Patent No. 456,567, dated July 28, 1891.

Application filed February 18, 1891. Serial No. 381,957. (No model.)

To all whom it may concern:

Be it known that I, MARTIN E. HERSHEY, of Harrisburg, in the county of Dauphin and State of Pennsylvania, have invented certain new and useful Improvements in Road-Rollers; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

This invention relates particularly to improvements in that class of machines employed in rolling the surfaces of roadways or picking the same up, which are self-impelled by means of a steam-engine forming part of the machine, although applicable to any ordinary traction-engine; and the object of the invention is to provide an improved cylinder-mounting and construction by which the machine is made more compact, rigid, and the parts more convenient of access, and further enabling the cylinders, dome, and connected parts to be set up and put in perfect alignments before being mounted on the machine, it only being then necessary to couple on the connecting-rods and secure the cylinders in place to put the parts in running order.

The invention consists in certain novel details of construction and combinations and arrangements of parts to be hereinafter described, and pointed out particularly in the appended claims.

In the accompanying drawings, Figure 1 is a side elevation of a road-roller constructed in accordance with my invention. Fig. 2 is a transverse vertical section through the boiler-cylinders, steam dome, chest, and chamber. Fig. 3 is a top plan view of the engine-mountings removed from the machine. Fig. 4 is a central longitudinal vertical section looking toward the right, Fig. 2, and showing one valve and its connections with the link and tumbler-shaft. Fig. 5 is a horizontal section through the cylinders, steam-chest, and valve-chambers. Fig. 6 is a face view of one of the guide-yokes.

Similar letters of reference in the several figures indicate the same parts.

The machine illustrated in the drawings, and which embodies my present invention, is the one known as the "Harrisburg Road-Roller," and, being familiar to those skilled in this art, the general features of construction will not be specifically set forth, but only referred to generally.

The boiler A, with its attached fire-box and rear extension B for the tank and fuel supplies, constitutes the main frame or body of the machine, the broad guide-roller C being connected thereto by the extended fore end or head $B^{\times}$, in which is socketed to turn horizontally the fork or yoke B′, carrying the journals of the guide-roller. The roller is turned by means of the chains *b*, drum-shaft *b*′, and rod-worm and hand-wheel b^2.

The main or drive wheels D are mounted on a shaft *d*, passing through between the boiler and tank, and carrying also the gear-wheels *d*′, deriving their motion from the small gears d^2, driven by suitable gearing and connections from the crank-shaft E.

Crank-shaft E and the shafts carrying the gearing aforesaid are all journaled in bearings held by the side plates *e* in a well-understood manner, and to the front of these plates is bolted what I shall term the "spectacle-plate" F, having suitable apertures therein, through which the connecting-rods between the piston slide and crank-shaft and the links and eccentrics work.

The cylinders, as will be inferred from the foregoing, are mounted forward of the spectacle-plate, and in the present instance I design to form both cylinders, the saddle for holding the same in place on the boiler, the valve-chambers and the seat for the steam-dome in a single casting, with a passage at the bottom communicating with the boiler and passing through the casting to a point above the level of the cylinders, where it opens into the dome.

By reference to Figs. 2, 3, 4, &c., it will be seen that a base or saddle G, conforming to the outer surface of the boiler, is provided and formed integral therewith. Above the same are the steam-cylinders H, one at each side, with a space between them constituting the valve-chest H′. Below the level of the valve-chest is a steam-chamber H^2, which, through an opening *h*, communicates directly with the top of the boiler, and from the top of this chamber two passages *h*′ *h*′ pass up-

ward through the steam-chest and open into the annular base h^2 of the steam-dome. From this dome the steam enters the valve-chest through the throttle-valve I and opening i. On the annular seat h^2 is secured by bolts or otherwise the steam-dome h^3, which may, if desired, be provided with a cover of any approved pattern, and at the top is surmounted by a whistle, safety-valve, or other appropriate device. The saddle or base G is extended forward some little distance and is formed into a flat seat g, to which the casting G′, forming the bearing for the valve-rod and tumbler-shaft, is secured.

I prefer to employ ordinary piston-valves, as shown clearly in Fig. 4, the steam-ports from the valve-chest to the cylinders being formed in the casting; but immediately adjacent the valves are located hardened bushings h^4, in which the openings are also formed, as will be readily understood by those skilled in the art.

I provide piston-heads K for the piston having forward projections k, between which the usual stuffing-box is located, and connected to these projections are the slide-guides K′, one at top and bottom of each cylinder, and each pair united at the outer end by a guide-yoke K^2, which has a central aperture, and when the parts are assembled, as will be hereinafter described, is bolted flat against the spectacle-plate.

In assembling the parts going to make up the engine proper, and which it will be understood is done before mounting on the roller, the pistons and valves with their rods are fitted and placed in position in the usual way, the slide-guides are rigidly secured in place with the yokes at the outer end, the slides placed in position, and the parts aligned and fitted up ready for operation. The bearings L for the valve-rods are preferably somewhat enlarged to accommodate the enlarged end of said rods to prevent, as much as possible, the wear by reason of the side-thrust of the link movement, and when the valve-rods are in position the links M are mounted in place and connected by the links M′ with the crank-arms M^2 on the tumbler-shaft M^3, which has been previously mounted in the bearings L′ on the casting G′, which latter, as before stated, is secured rigidly in place on the forward extension of the saddle.

The throttle-valve stem passes out through the front of the dome, and is operated by means of small lever O, pivoted on a small projection on the cylinder-casting and having an operating-rod o passing back to a point within reach of the engineer.

When the parts have been assembled and set up in proper alignment, they are ready to be mounted on the roller, which may then be done, and the whole secured in place by bolts G^3, passing into the boiler-shell, care being had that the opening h in the bottom of the casting shall register with a corresponding opening in the boiler-shell, and when this has been done a screw-threaded sleeve O^2 is screwed into the opening h and set-nuts O^2 placed on its outer end to firmly clamp the boiler-shell around the opening, giving a steam-tight joint and preventing any weakening of the shell at this point.

The guide-yokes K, when the cylinders are mounted in position, abut against the spectacle-plate and are secured firmly thereto, any slight space left between the two being filled in with spelter and the whole bolted in place, after which it is a simple matter to make the connections with the connecting-rods P and link-rods P′ in the ordinary manner.

The tumbler-shaft is operated by means of the downwardly-extending crank-arms p, as shown in dotted lines, Fig. 1, the rod passing back, and the hand-lever p', to which said rod is connected, the segment and locking-pawl being preferably provided for holding the hand-lever and tumbler-shaft in position.

Both piston-valves are made hollow all the way through, and the exhaust passes from the forward end through the valve and from the rear end directly to the rear end of the valve-casing, where each casing opens through one arm of a Y-connection of the exhaust-pipe Q, which passes directly into the smoke-stack, as shown clearly in Fig. 1.

The herein-described construction of cylinder and mountings will be seen to possess many advantages in connection with this and analogous machines subjected to heavy strains and liable to have the base-line changed at any moment and the water thrown violently about, for the steam is not taken directly from the boiler to the cylinders, but first passes above the same into the steam-dome, and thence through the throttle to the cylinders, overcoming all danger of entrained water being carried into the cylinder or to the valve-chamber.

The advantages of this structure and arrangement over and above those just mentioned result from the fact that the cylinders are brought into intimate relation with the live-steam chamber at the bottom with live steam on one side and above them in position to prevent condensation to any material degree, and, further, the cylinders themselves contribute largely to the efficiency of the engine by absolutely preventing any condensation in the valve-chambers or steam-chest, which latter is entirely surrounded by steam-spaces of one form or another except at the ends. So, too, by providing the steam-chamber immediately above the boiler not only is entrained water caught, but there is afforded a very much larger live-steam space than could be secured from the dome alone, and the cylinders therefore have ample space from which to draw their supply. By locating the dome above the valve-chest instead of forward of the cylinders, as is usual, an additional advantage is secured, inasmuch as the machine may be foreshortened and the exhaust be passed directly from the valve-

casings to the stacks without impediment, enabling larger engines to be employed.

Having thus described my invention, what I claim as new is—

1. In a road-roller, the combination, with boiler, wheels, and complementary parts, of the saddle mounted directly on the boiler, the two cylinders formed integral therewith, one on each side, the valve-chest between the cylinders, having seats for both valves therein, the steam-dome above the valve-chest, and the passages leading from the boiler through the valve-chest to the dome and from the latter into the said chest, substantially as described.

2. In a road-roller, the combination, with the boiler, wheels, and complementary parts, of the saddle mounted directly on the boiler, the two cylinders formed integral therewith, one at each side, with the valve-chest between them, the dome-seat above the chest and the steam-cylinder below the same, the dome mounted on said seat, and passages leading from the boiler to the steam-chamber and passages from the latter through the valve-chest to the dome and from the latter into the said chest, substantially as described.

3. In an engine-mounting for road-rollers, the combination, with the saddle adapted to fit the boiler, the cylinders connected rigidly therewith, the valve-chest between the cylinders, and the steam-dome mounted above said chest, of the slide-guides connected rigidly to the cylinders, and the guide-yokes rigidly connecting the outer ends of the guides on each side, said parts being assembled and aligned before being mounted on the machine, substantially as described.

4. In an engine-mounting for road-rollers, the combination, with the saddle adapted to fit the boiler, the cylinders formed integral therewith on each side with the valve-chest between them, and the steam-dome above said chest, of the forward extension of the saddle having the seat formed thereon, and the casting having the bearings for the tumbler-shaft and valve-rods thereon, substantially as described.

5. In an engine-mounting for road-rollers, the combination, with the saddle adapted to fit the boiler and having the forward extension with seat thereon, the cylinders formed integral with the saddle, with the valve-chest and steam-chamber between the cylinders, of the dome mounted above the chest, passages leading from the boiler to the steam-chamber, from the latter to the dome, and from the dome to the valve-chest, the casting having the bearings for the valve-rods, and tumbler-shaft mounted on the seat at the front of the saddle, the slide-guides connected rigidly to the cylinder-heads, and the yokes rigidly connecting the outer ends of the guides and adapted to be secured to the spectacle-plate, substantially as described.

MARTIN E. HERSHEY.

Witnesses:
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JOHN GASTROCK.