

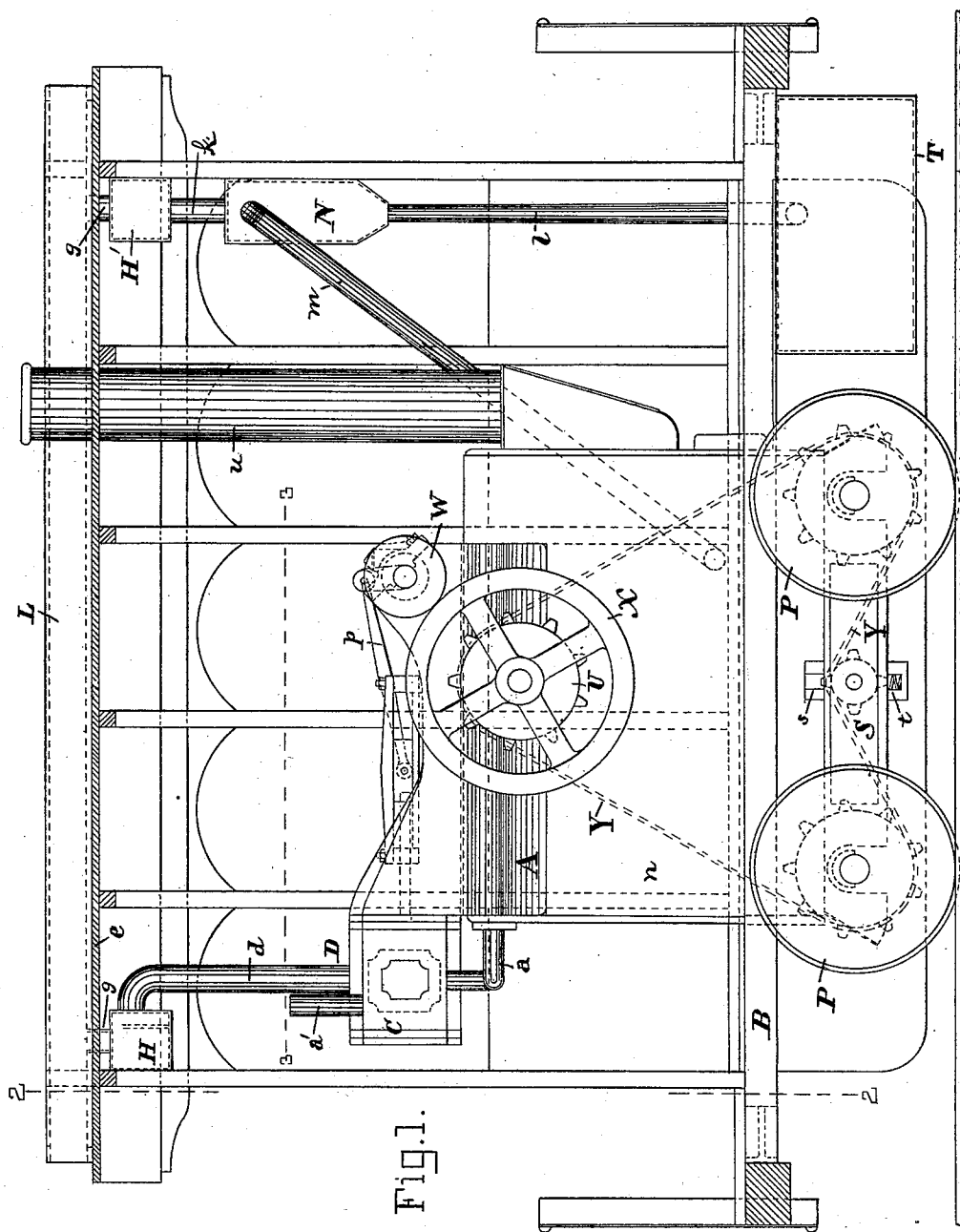
(No Model.)

2 Sheets—Sheet 1.

W. SIMPKIN.
STREET MOTOR.

No. 428,573.

Patented May 20, 1890.



WITNESSES:

O. H. Ehlers.
John E. Morris.

INVENTOR:

Wm Simpkin

BY *Chas B. Mann*
ATTORNEY.

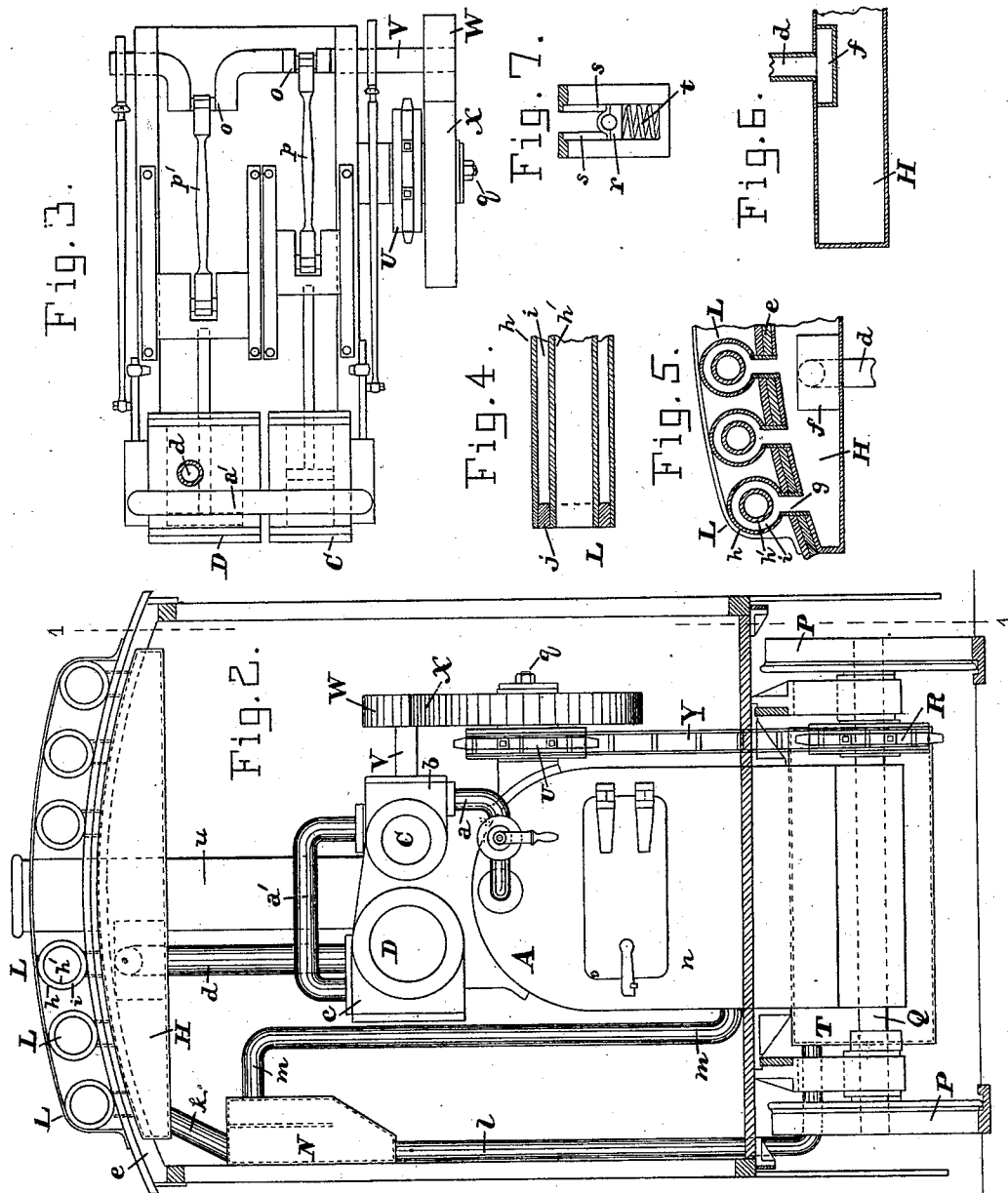
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UNITED STATES PATENT OFFICE.

WILLIAM SIMPKIN, OF RICHMOND, VIRGINIA, ASSIGNOR TO THE RICHMOND STREET MOTOR COMPANY, OF SAME PLACE.

STREET-MOTOR.

SPECIFICATION forming part of Letters Patent No. 428,573, dated May 20, 1890.

Application filed October 23, 1889. Serial No. 327,930. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM SIMPKIN, a citizen of the United States, residing at Richmond, in the county of Henrico and State of Virginia, have invented certain new and useful Improvements in Street-Motors, of which the following is a specification.

This invention relates to improvements in motors or locomotives for street-cars.

It is the object of the invention to provide a noiseless and smokeless locomotive for use on streets and roadways.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section of the motor. Fig. 2 is a vertical cross-section on the line 2 2 in Fig. 1. Fig. 3 is a top or plan view of the engine-cylinders and other parts on line 3 3. Fig. 4 is a longitudinal section of one end of one condenser-tube. Fig. 5 is a vertical cross-section of part of a condenser-box, condenser-tubes, and short connecting-pipes. Fig. 6 is a horizontal cross-section of one of the condenser-boxes. Fig. 7 is a detail of the spring-box of the chain-slack take-up wheel.

The letter A designates the boiler, and B the frame of the locomotive, which supports the boiler and other parts. A high-pressure cylinder C and a low-pressure cylinder D are both mounted upon the boiler and have no other support. A steam-pipe *a* leads from the boiler to the chest *b* of the high-pressure cylinder, and a pipe *a'* leads from said high-pressure cylinder to the chest *c* of the low-pressure cylinder, and an exhaust-pipe *d* leads from the latter to the overhead condenser-box H, which extends crosswise of the roof *e* at one end of the motor. The exhaust-pipe *d* enters the side of the condenser-box, and the latter has on its inner side a diaphragm plate or curb *f*, which confronts the open end of said exhaust-pipe *d*, as plainly shown in Figs. 5 and 6, and as indicated by broken lines in Fig. 1. The exhaust-steam from the pipe *d* will pass over the plate or curb *f* and expand in the box H. The plate *f* will prevent the water of condensation that accumulates in the box from returning to the exhaust-pipe. A second condenser-box H' is

at the other end of the car-roof, and a series of condensing-tubes L extend longitudinally of the roof and are connected with both boxes H H' by short pipes *g*. The condensing-tubes are formed by two pipes *h h'* of different size. The smaller pipe *h'* is inside of the larger one *h*, and thus forms between them an annular steam-space *i*. (See Fig. 4.) At the ends the annular space is closed by a ring-stopper *j*; but the inside tube *h'* is open from end to end. The short pipes *g* lead from the top of the condenser-box through the outer tube *h* to the annular space *g*. Air passes freely through the inside tube *h'*, and by keeping the pipes cool serves to rapidly condense the steam in the annular space. It will be seen that the exhaust-steam passes from the low-pressure cylinder to the first condenser-box H at one end, thence into the numerous condensing-tubes L, (in the present instance six in number,) and from these to the second condenser-box H' at the other end, by which time the steam is nearly all condensed. A separator-box N is below the second condenser-box H', and a pipe *k* connects the two. A drip-water pipe *l* leads from the bottom of the separator to a tank T below the floor, and a steam-pipe *m* leads from one side and near the top of the separator to the side of the furnace or fire-box *n*, whereby undensified steam is decomposed and passes invisibly out the stack *u*. A diaphragm (indicated in Fig. 2 by broken lines) is pendent from the top of the separator-box N in front of the open end of the steam-pipe *m*. This pendent diaphragm prevents drip-water from entering the steam-pipe *m*. The driving-axes Q have ordinary track-wheels P, and each axle is also provided with a sprocket-wheel R.

Returning now to the engine, the letter *v* designates a crank-shaft having two throw-arms *o*, with which rods *p p'* connect from the pistons of the high and low pressure cylinders. The valve-rods and other parts of the engine are unnecessary to describe here, as they may be of any well-known form. The crank-shaft *v* carries at its end a pinion W, which may be either a toothed pinion or a friction-pinion, and which drives a wheel X,

mounted loosely on a stud *g*, projecting from the boiler. A sprocket-wheel *U* is attached to the loose wheel *X*. An endless drive-chain *Y* passes over the sprocket-wheel *U*, and thence down and under the sprocket-wheels *R* on the axles. It will thus be seen that through the medium of the chain *Y* motion is imparted to the driving-wheels *P*, and thereby the motor moved. A slack-take-up sprocket-wheel *S* is mounted in a bearing *r* between the two drive-wheels *P*. This bearing fits in a vertical slide-box *s*, and the bearing rests on a spiral spring *t* directly under it. The upward pressure of the spring *t* tends to keep the chain taut.

The smoke-stack *u* is useful in starting a fire, but on the road will emit little or no smoke, as a coke or gas made from petroleum is to be used for fuel.

The construction of many parts of this motor may be altered or modified from what is shown in the drawings. They may be made of any suitable material and of any size to suit the purpose for which the motor is to be used.

It will be observed that all the parts are arranged with respect to each other to make a compact locomotive.

Having described my invention, I claim—

1. In a street-locomotive, the combination of the car-roof provided with two or more annular-spaced open-center condensing-tubes extending longitudinally, a condenser-box

H, extending in a direction crosswise of the roof and the said tubes, a pipe *g*, connecting the annular space of each tube with the condenser-box, the engine which furnishes the power for impelling the locomotive, and an exhaust-pipe *d* from the engine to said overhead condenser, substantially as specified.

2. The combination of a locomotive-roof and two condensing-boxes *H H'*, each supported at an opposite end of the roof, two or more annular-spaced open-center condensing-tubes extending longitudinally of the roof and connecting the two condensing-boxes, the engine which furnishes the power for impelling the locomotive, an exhaust-pipe *d* from the engine to one of the said condenser-boxes, a water-tank, and a pipe to convey the drip-water from the other condenser-box to the tank, substantially as specified.

3. In a street-locomotive, the combination of the car-roof and condensers supported thereon, a steam-engine, a furnace, a water-tank supported by the car-floor, a separator-box *N* below the said roof-condensers, a steam-pipe *m*, leading from the separator-box to the furnace, and a drip-water pipe *l*, leading therefrom to the tank, as described.

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

WM. SIMPKIN.

Witnesses:

JOHN E. MORRIS,
JNO. T. MADDOX.