

Abbott Q. Ross

Imp't in
ROAD MACHINES

No. 118,395.

Patented Aug. 22, 1871.

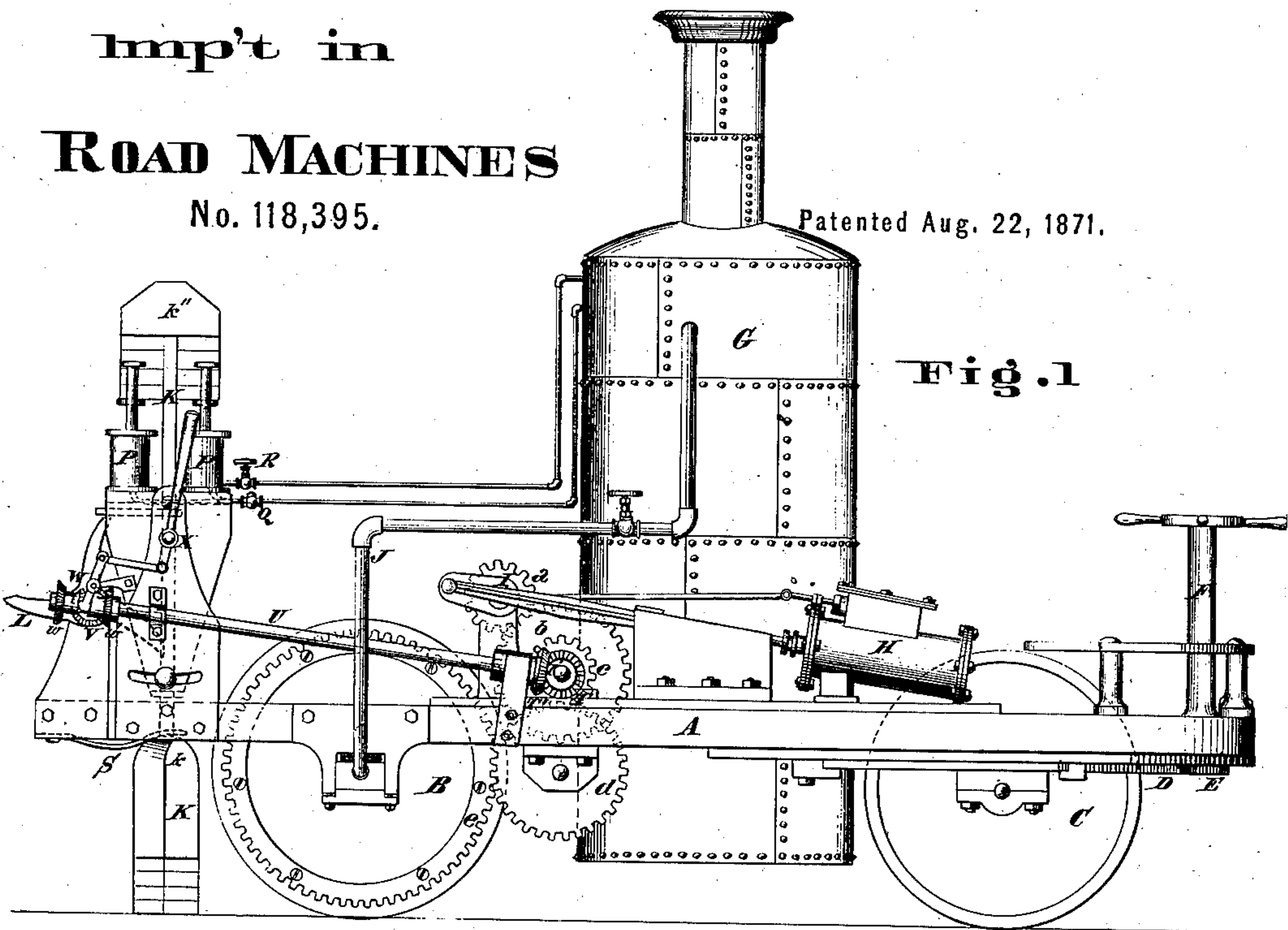


Fig. 1

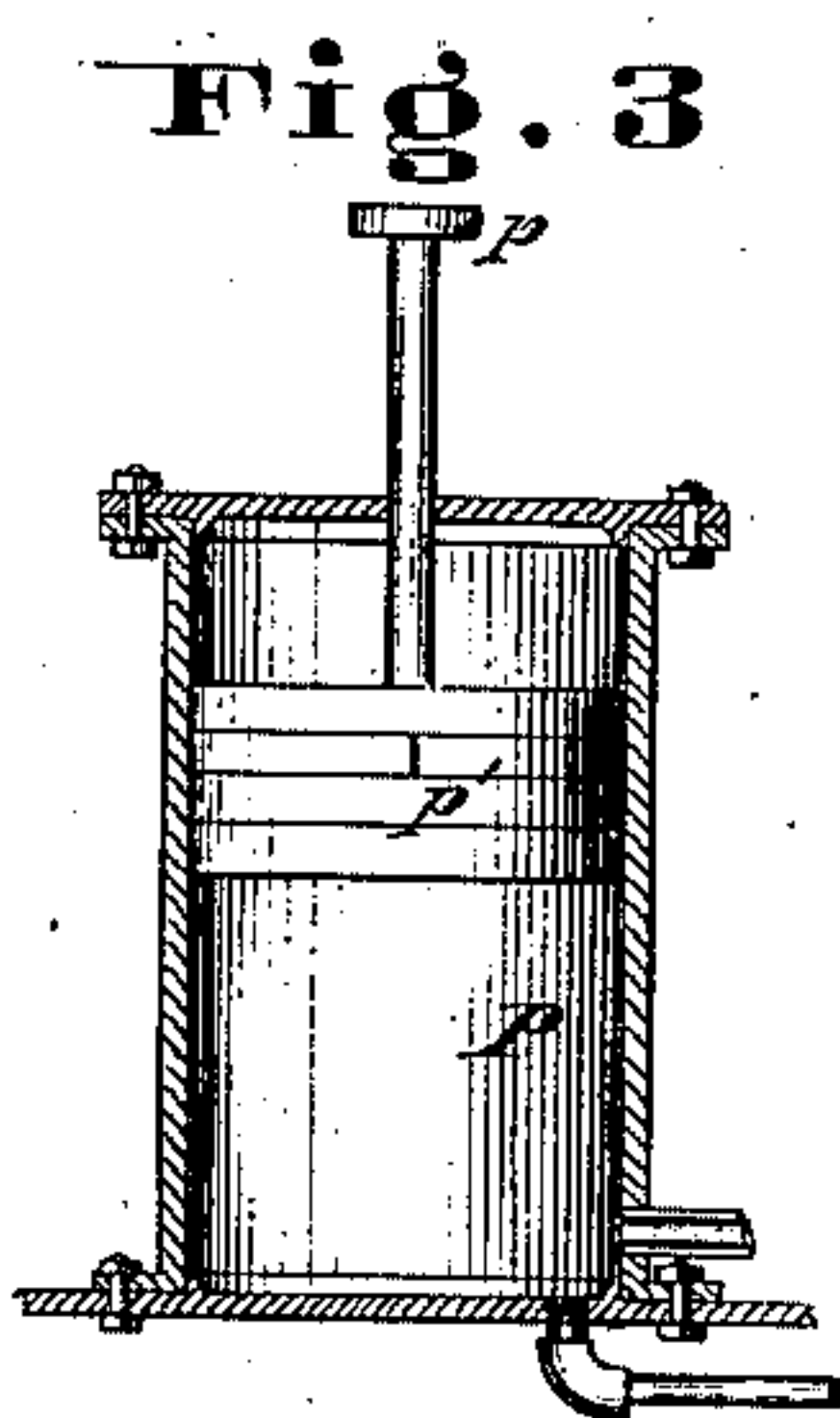


Fig. 3

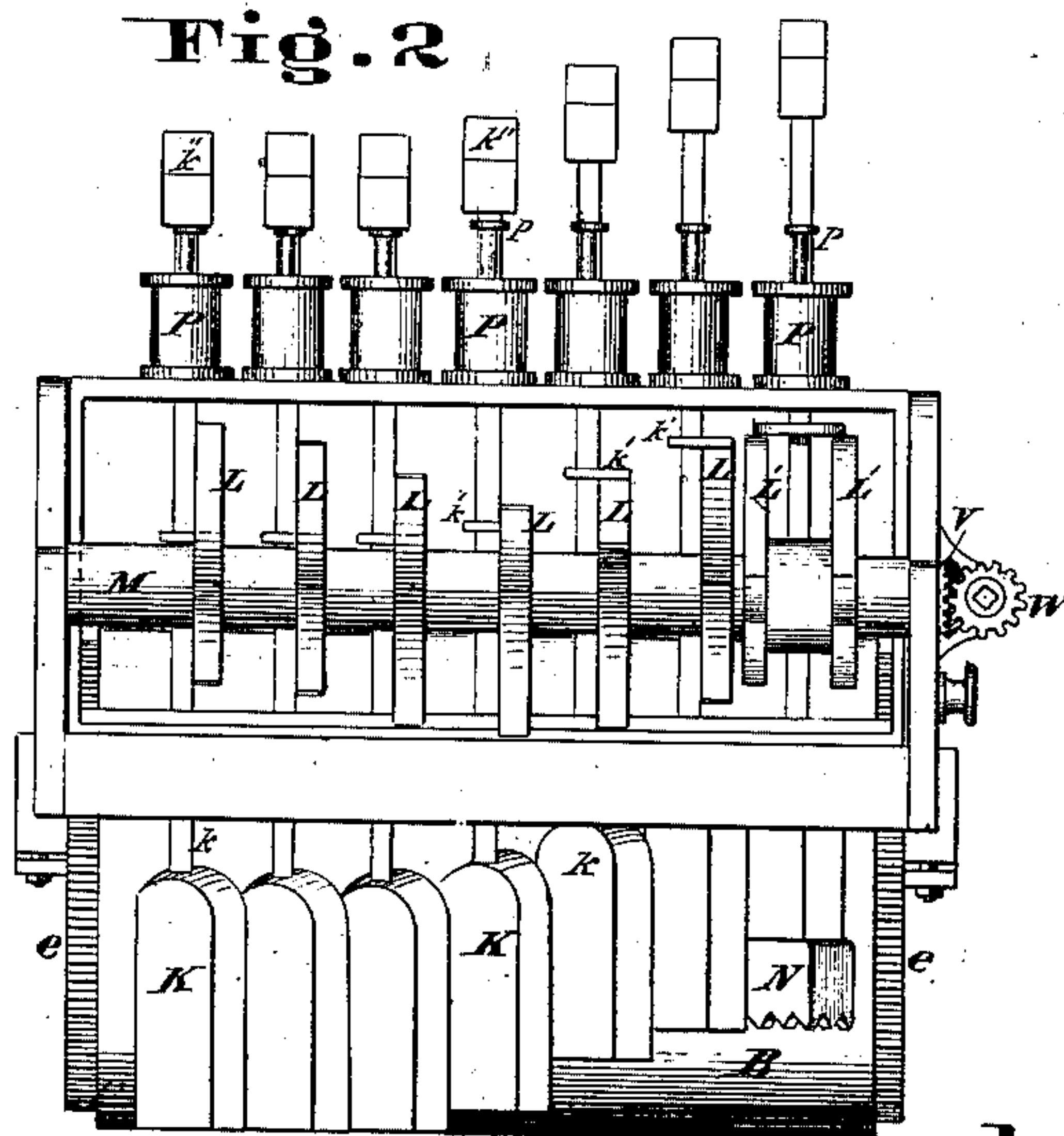


Fig. 2

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IMPROVEMENT IN MACHINES FOR ROLLING AND RAMMING ROADS.

Specification forming part of Letters Patent No. 118,395, dated August 22, 1871.

To all whom it may concern:

Be it known that I, ABBOTT Q. ROSS, of Cincinnati, Hamilton county, State of Ohio, have invented certain new and useful Improvements in Machines for Rolling and Ramming Pavements, Roads, &c., of which the following is a specification:

My invention consists: First, in the combination of rolling and ramming devices in one self-propelling machine for the purpose of enabling the machine to ram and roll simultaneously in passing over a street or road, the machine being so constructed that the rammers may precede or follow the roller. Second, in the provision and peculiar construction of steam-cushions in connection with the rammers by means of which each rammer is lifted slightly from the ground, after its blow is struck, to prevent dragging. Third, in the provision of a steam-heating device for the roller, to adapt the machine for rolling concrete pavements in which coal-tar is an ingredient. Fourth, in a certain construction and arrangement of the rammers with relation to each other by which the rammers overlap each other, and no part of the road is permitted to escape the rammers which is within their width, collectively. Fifth, in the provision and arrangement, in combination with the rammers, of springs to catch the rammers near the termination of the ascending stroke and assist in their speedy return for the blow. Sixth, in a certain construction and arrangement of steam-cushion, rammer, and rammer-lifter by which the lifter straddles the cushion and connects with both sides of the rammer, and thus a very strong, compact arrangement of the parts is effected. Seventh, in certain devices by which the rammers are rendered detachable from the operative mechanism of the roller in order that the roller may be operated alone when necessary, the same device serving to reverse the direction of rotation of the engine and at the same time preserve the proper direction of rotation for the cam-lifter to permit the rammers to either precede or follow the roller. Eighth, in the provision, in connection with the rammers, of shoes for breaking rock.

Figure 1 is a side elevation of a machine embodying my invention. Fig. 2 is an end elevation of the same. Fig. 3 is a section of the steam-cushion device for lifting the rammers off the ground after the blow is struck.

A is the frame of the machine. It may embody a water-tank in its construction if preferred, or the tank may be separate therefrom. B is the roller upon which the greater portion of the weight of the machine rests, so that the roller may press heavily upon the ground. C is a steering-wheel, placed midway in the width of the machine and adapted by swiveling (by means of curved rack D and pinion E of steering-shaft F) to direct the movement of the machine. G is a steam-boiler secured to the frame A of the machine. It supplies steam to the engine H, which operates the roller B. The engine-shaft I is connected to the roller by gear-wheels *a b c d*, the roller being furnished with a spur-wheel, *e*, to match wheel *d*. The roller B is made hollow and is journaled (upon one end at least) on a hollow axle, through which steam may be introduced for the purpose of heating the roller when the machine is used for concrete or plastic pavements. Steam is conducted to the roller through pipe J. The roller, being hollow, may also be filled with water when extra weight is required for rolling purposes, the water being discharged, of course, when it is desirable to reduce the weight of the machine. I would here remark that I do not claim, broadly, the use of a water-weighted roller. K represents a series of vertical rammers, operated by revolving cams L upon the shaft M. Each of the rammers K is constructed with a heavy end, *k*, a projection, *k'*, by which they are lifted, and a head, *k''*, to connect with the cushion. The rammers may also be fitted with shoes, N, constructed with teeth on the under side for the purpose of breaking rock. The lifters L may be forked, as shown at L', in order that the lifter may straddle the cushion-cylinder P P, which it is in connection with, and the cylinders then may be placed below the shaft M. In the drawing, however, the cushion-cylinders P are arranged above the shaft M. They communicate with the steam-boiler by means of a single or double pipe, each at the bottom of the cylinder. If a double pipe is preferred, one has a check-valve, Q, which admits to the cylinder all the steam that may be necessary, but prevents any return through that pipe. The other is provided with a regulating-valve, R, through which the steam in the cushion is forced back into the boiler, when the falling rammer impinges against the head *p* and depresses the piston *p'* of the cushion, the amount of opening in valve R deter-

mining the resistance of the cushion. The head k'' , when the rammer falls, strikes the head p of the cushion, and the resistance offered by the steam pressure in the cylinder cushions the blow in such a way that immediately after the blow is struck the rammer is lifted off the ground and thus prevented from dragging on the ground as the machine moves forward. In order to compensate for the loss of force in the blow by the interposition of the cushion, each of the rammers is made to strike, in the upward stroke, against a spring, S , attached to the frame A , which acts to increase the velocity of the downward stroke by assisting the natural gravitation. The lifter-shaft M is operated by the shaft I' through bevel-gear $T T'$, shaft U , bevel-wheel V , and double-gear sliding sleeve W . This sleeve is so constructed and connected that when midway in its sliding movement it is not geared into the wheel V , and, consequently, the rammers are inoperative while the machine moves ahead for rolling purposes or traveling. When the sleeve is at either extremity of its sliding movement it is in gear, by one or other of its wheels w or w' , with the wheel V , and, by changing it from one to the other, the machine can move with the roller in front or with the rammers in front.

The machine is propelled wholly by the traction of the roller upon the ground, the roller being revolved by the steam-engine by the connection previously described. The sleeve $W w w'$ is adjusted by means of lever X . The weights k of the rammers are rectangular, in cross or horizontal section, and are arranged diagonally so that they overlap each other, as shown in Fig. 2, in order that no part of the road can escape the rammers as the machine passes over it.

I claim—

1. A self-propelling road-constructing machine, embodying in its construction a roller, B , and series of rammers $K L$, combined, connected, and operating substantially in the manner and for the purpose specified.

2. In the described combination with the rammers K , the steam-cushion $P p'$ connected to the boiler, and operating substantially as and for the purpose specified.

3. The hollow roller B , in combination with the steam-heating device $G J$, as and for the purpose specified.

4. The diagonal overlapping arrangement of the rammer-weights k , as and for the purpose described.

5. In combination with the rammers K and cushions $P p$, the springs S , as and for the purpose specified.

6. In combination with the rammers $K k k' k''$ and cushion $P p p'$, the straddling-lifter L' , as and for the purpose specified.

7. In combination with the lifter-shaft M and the propelling mechanism of the machine, the sliding sleeve $W w w'$, as and for the purpose described.

8. In combination with the ramming device $K k k' k'' L M$, the shoes N , as and for the purpose specified.

In testimony of which invention I hereunto set my hand.

ABBOTT Q. ROSS.

Witnesses:

J. L. WARTMANN,
FRANK MILLWARD.