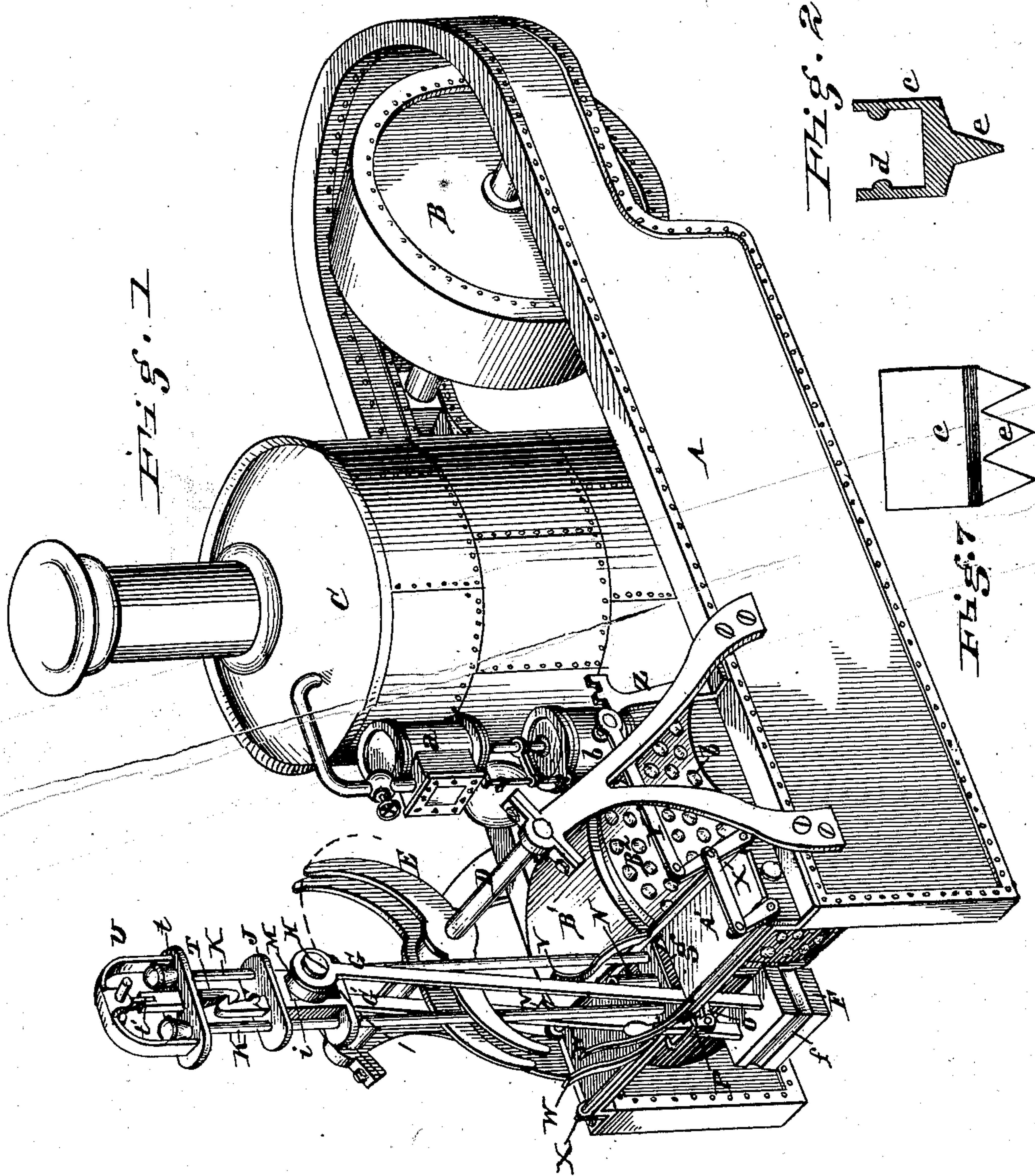


A. Q. ROSS.
Road-Rammer.

Patented June 22, 1875.

No. 164,877.



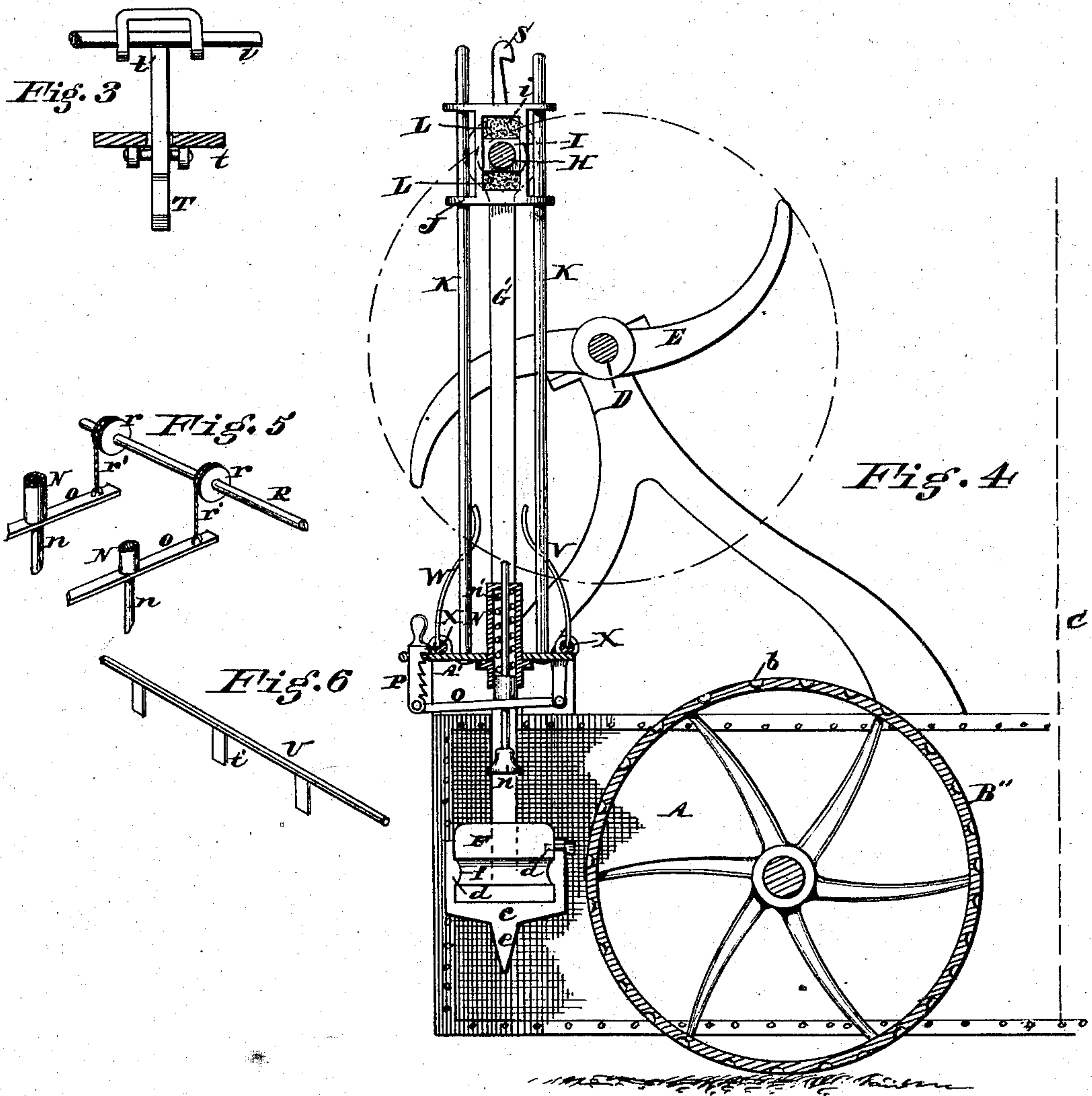
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UNITED STATES PATENT OFFICE.

ABBOTT Q. ROSS, OF CINCINNATI, OHIO.

IMPROVEMENT IN ROAD-RAMMERS.

Specification forming part of Letters Patent No. 164,877, dated June 22, 1875; application filed April 12, 1875.

To all whom it may concern:

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

My invention relates to improvements upon the machine for rolling and ramming roads for which Letters Patent No. 118,395 were issued to me August 22, 1871, and consist, first, in a peculiar device, by which the rammers, in the short interval of time between their fall and rise, are enabled to rest without dragging upon the ground, while the machine may be progressing forward or backward, in the process of rolling; second, in a peculiar device for guiding the falling rammers, so as to provide for the falling of the same in advance of the vertical line of fall, so as to permit a considerable rest upon the ground before rising; third, in a peculiar device which provides for the guiding of the falling rammers in advance of the vertical drop, whether the machine is moving backward or forward, this device embodying two sets of flexible guides operated by cross-shafts, so that either set may be released and the other brought into position for operation in guiding; fourth, in a peculiar device for suspending the rammers when not required to be in operation; fifth, in a peculiar device for increasing the velocity of the falling rammers beyond the velocity due to gravity; and, sixth, in a device for throwing the above out of connection when required; seventh, in a peculiar construction of the rammer-heads, by which provision is made for the attachment of different-shaped shoes, for the operations of flat ramming or rough spading, for breaking up streets, &c.; eighth, in a peculiar form of spade for attachment to the rammer-head; ninth, in a peculiar device for relieving the sliding boxes of the rammers from being battered up by the jar of the falling rammers; tenth, in a peculiar construction of the periphery of the rollers, which provides for the gripping of the bowlders on the pavement to aid in propulsion.

Figure 1 is a perspective view of a machine so far completed as to exhibit my present improvements. Fig. 2 is a section of one form of shoe. Fig. 7 is a side elevation of same

form of shoe. Fig. 3 is a side view of the device for suspending the rammers. Fig. 4 is a longitudinal section through the end of the machine, bearing the rammers. Fig. 5 is a view of a modification of the device for suspending the operation of the mechanism which increases the velocity of the falling rammers. Fig. 6 is a perspective view of the cross-bar which connects the hooks for supporting the rammers in the suspended position.

A is the frame of the machine, which, in this case, is an inclosed water-tank, which can be used for the triple purpose of regulating the weight of the machine by the addition or subtraction of water; as a tank for water to feed the boiler; and as a tank to supply water for a fire-pump to be carried upon the machine. The frame is mounted on the rollers B B¹ B², the forward one being adjustable laterally to guide the machine, and the others attached to an engine, by which they are propelled, the engine being operated by the boiler C. The shaft D which operates the rammers is driven by the same engine that operates the propelling-rollers B¹ B². The engine, and gearing for connecting it to the rammer-shaft and propelling-rollers, are not shown in the drawing, as they may be of any desired construction, and connected in any suitable way. The rollers B¹ B² may be smooth faced, as shown at B¹; but I prefer that their peripheries shall be indented with concavities *b*, each adapted to encompass the end of a bowlder, and act to prevent the slipping of the rollers on a bowlder street during the act of propulsion. In the drawing but one rammer is shown; but any number of rammers may be used of the same construction, the figures 5 and 6 showing the devices which connect the suspending hooks and the springs of the series of rammers together, when a series is used. The shaft D is provided with lifting-cams E, for raising the rammers, the teeth of the cams playing between the side-rods of the rammers. Each rammer is constructed as follows: F is the weight or head of the rammer, attached, as shown, to the two-sided rods G G', the latter being constructed to pass through slots *g* in plate A', and swing upon the trunnions H which project from the ends of shaft I. The shaft I is fitted to slide within the vertical slot

i in the sliding head J, which is perforated to fit over and slide vertically on the guide-rods K. Rubber bumpers L are fitted in the ends of the slot *i* to snugly embrace the shaft I, the rubber serving to relieve the head J from the shock of the fall, and to relieve it from sudden shock when the cam commences to lift.

Rollers M are fitted to the trunnions H for the surface of the cam to ride over, the rollers serving to diminish the friction on the cams, and to furnish a rolling-surface to lift against.

To increase the velocity of the fall of the rammer beyond what is due to gravity I provide a cylinder, N, over each rammer-head, the cylinder having a spring, *n*, fitted within it, and a plunger, *n'*, against which the head of the rammer strikes on the upward stroke. The retractile force of the spring starts the rammer down at a velocity above what is due to gravity. The operation of this spring may be suspended, when necessary, by means of the lever *o*, acting to compress the spring, so that the head of the plunger escapes contact with the rising rammer. This lever may be sustained by the hinged and toothed handle P engaging over the plate A'. This handle is adapted to act upon a single spring only; but where a number of rammers are used the levers *o* may be lifted simultaneously by the shaft R, pulleys *r*, and chains *r'*.

A hook, S, is attached to the head J, by which the rammer may be suspended when necessary. The device for engaging with this hook for suspension is as follows: A corresponding hook, T, is pivoted to the frame *t*, which connects the guide-bars, its upper end having a light flat spring, *t'*, attached, which passes through a slit in the cross-shaft V.

The spring serves to assist and provide for the hooking when the shaft U is liberated; but the shaft U (which may extend so as to embrace the springs of all the rammers on the machine) may be moved by any proper leverage, so as to throw the hooks T to one side and prevent it acting to suspend the rammer, and in this condition the rammers are permitted to make regular successive strokes.

By reason of the rammers being permitted to swing on the lifting-head J in the slots *g*, the machine may be made to progress in its forward or backward course—including, of course, the interval between the blow of the rammer and the next lift—without the rammers having to drag on the ground, as, in the forward or backward motion of the machine during this interval, the rammer swings on its trunnions while resting on the ground.

In order to permit a long rest without making a long slot, *g*, I provide for the dropping of the rammer out of the perpendicular, and against that end of the slot which is in the advance, as the machine progresses either backward or forward, so that the side rods G G' may travel the whole length of the slot while the rammer rests on the ground. To accomplish this when the machine is running backward I employ the springs V in the position

shown in Fig. 1. They press against the edges of the bars G G', as shown, and, as the rammer descends, force it over in the direction of the motion of the machine, so that when it drops it is then so far forward of its center line that it is enabled to rest on the ground the full length of the slot, while the machine steadily progresses, the spring giving way in this motion of the machine.

When the machine is traveling forward I use the springs W in the same way, and relieve the springs V from connection. To accomplish this I have the springs attached to shafts X, which are connected by levers and link to the rod Y, the projecting end of which drops into one or the other of the three notches of the plate Z. The center notch holds the springs equally away from the rods, as seen in Fig. 4, and the machine is then adapted for ramming while stationary.

In machines of this class heretofore no provision has been made by which the machine can be converted into one of a different class; but in the machine herein illustrated I have designed means by which it may be converted into a fire-engine for use on roads where fire apparatus is inaccessible, and to this end I provide a steam-pump, *a b*, whose pump may be so connected and constructed that it may draw water from tank A, and, when that is empty, may use ordinary suction-hose to pump from a well or cistern, and thus do continual duty as a fire-engine. The lower end of each rammer—that is, the head F—is grooved at *f* to receive detachable and interchangeable shoes *c*, which are provided with ribs *d* to match the grooves, and are secured by screw *d*.

For breaking up street I have designed the shoe shown clearly in Figs. 2 and 7, which has projecting teeth *e*, as shown, for entering the ground in the manner of a spade.

I claim—

1. The combination of sliding head J H and swinging rammers F G, operating substantially as and for the purpose specified.
2. In combination with the swinging rammers F G, the spring V or W operating substantially as and for the purpose specified.
3. In combination with the swinging rammers F G, the alternating springs V W, operated substantially as and for the purpose specified.
4. The combination of rammer-hook S, pivoted hook T, spring *t'*, and cross-shaft U, substantially as and for the purpose specified.
5. In combination with the rammer-heads F the cylinder N, spring *n*, and plunger *n'*, operating substantially as and for the purpose specified.
6. The combination of cylinder N, spring *n*, plunger *n'*, and lever *o*, connected and operating substantially as and for the purpose specified.
7. The rammer-head F constructed with grooves *f*, for attachment of interchangeable shoes, substantially as and for the purpose specified.

8. The shoe or spade *c d*, having projecting teeth *e*, substantially as and for the purposes specified.

9. The combination of sliding head *J i*, trunnion-shaft *I*, and rubber springs *L*, operating substantially as and for the purpose specified.

10. The roller or rollers *B* having concavi-

ties or circular indentations *b*, substantially as and for the purpose specified.

In testimony of which invention I hereunto set my hand.

A. Q. ROSS.

Witnesses:

JOHN E. JONES,
J. L. WARTMANN.