

3 Sheets—Sheet 1.

No. 452,184.

Patented May 12, 1891.

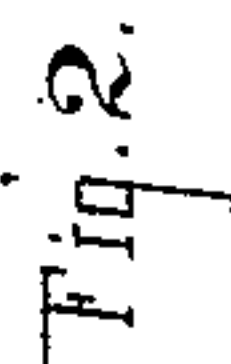


Fig. 1.

Witnesses:

Wm Mayer.

Amharlot

Inventor:

Frank R. Huntington
By Smith & Osborn
his Atty's

(No Model.)

3 Sheets—Sheet 2.

F. A. HUNTINGTON.
POWER STREET PAVING MACHINE.

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Fig. 3.

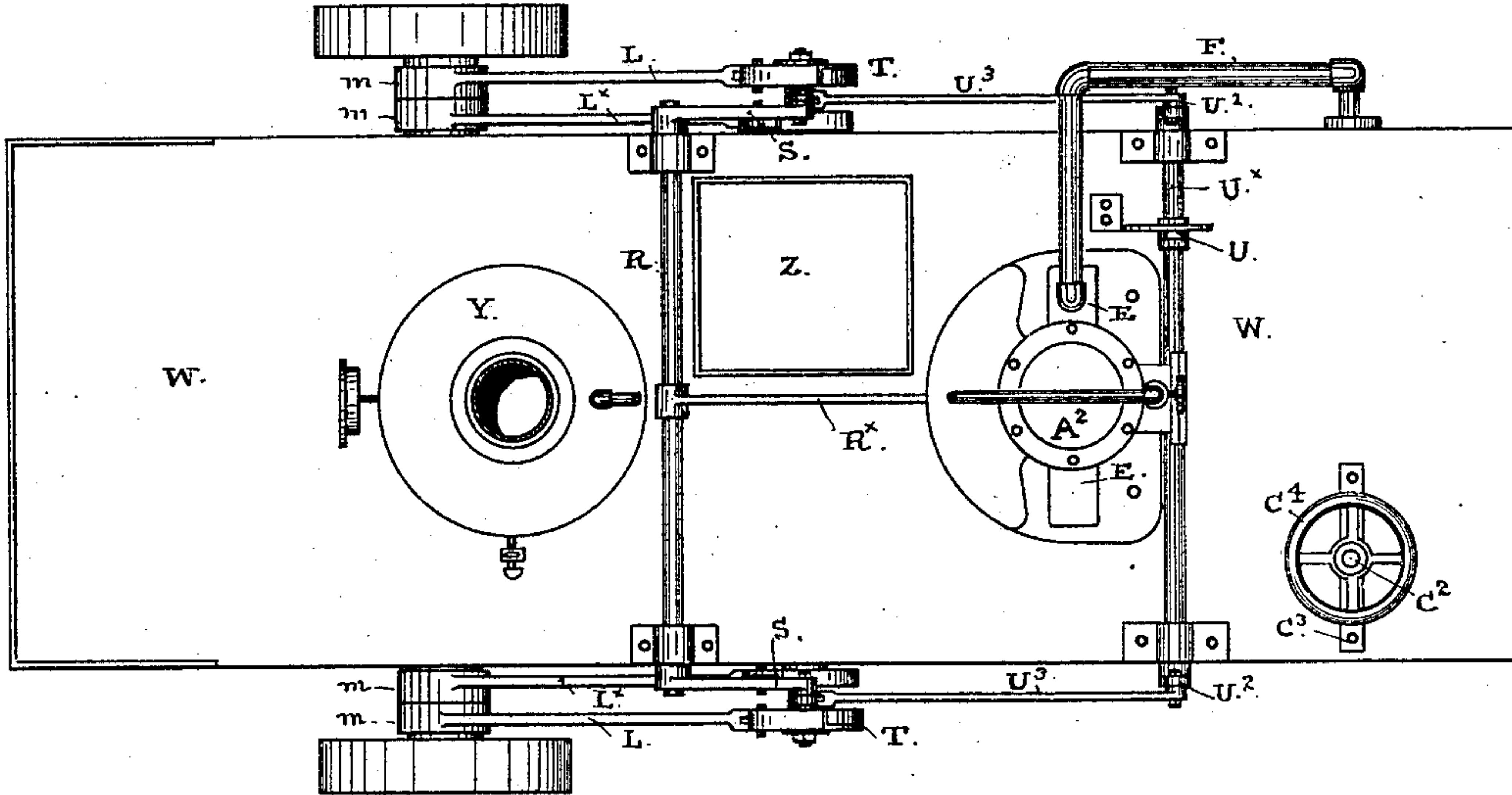


Fig. 4.

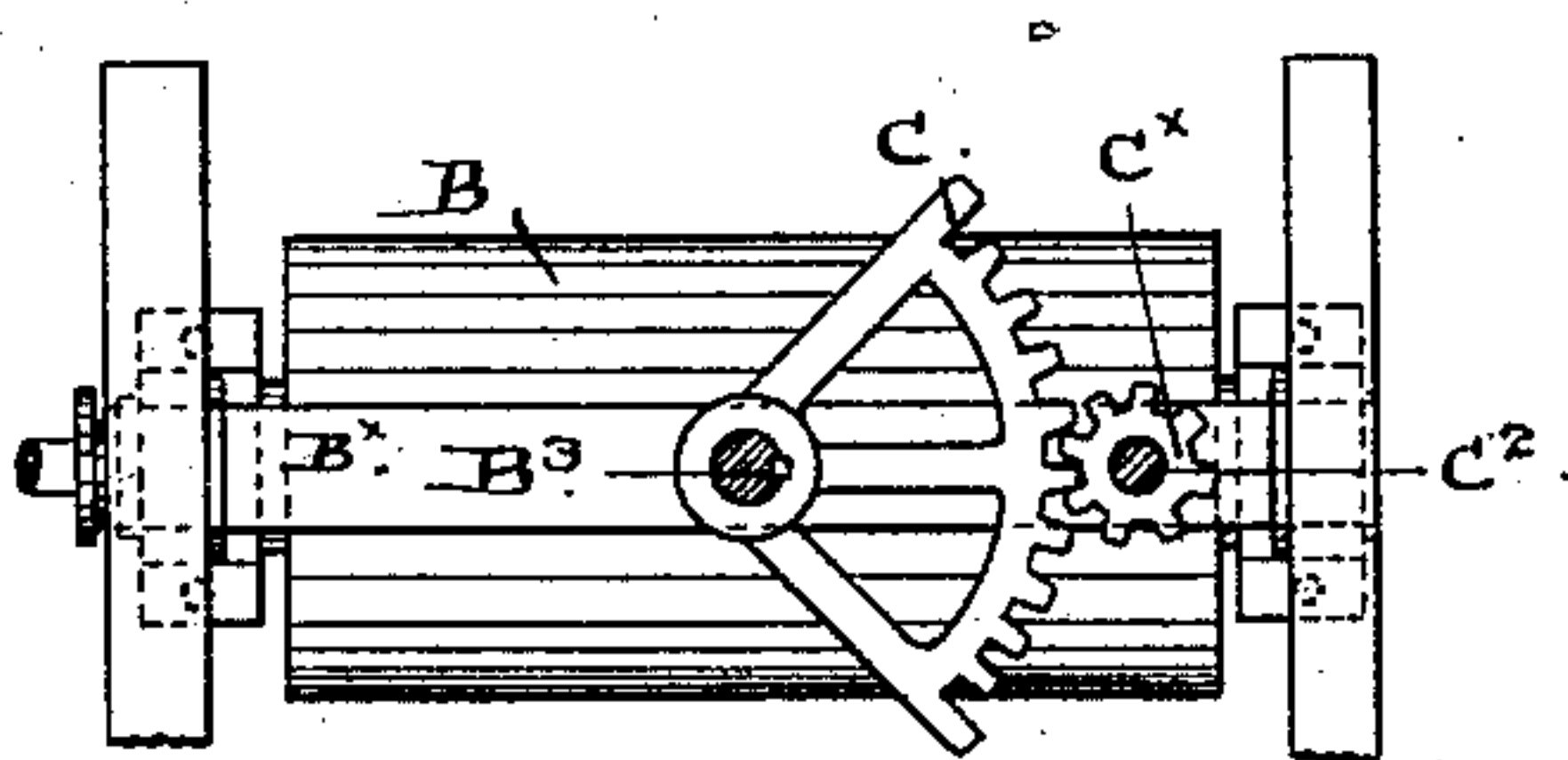


Fig. 5.

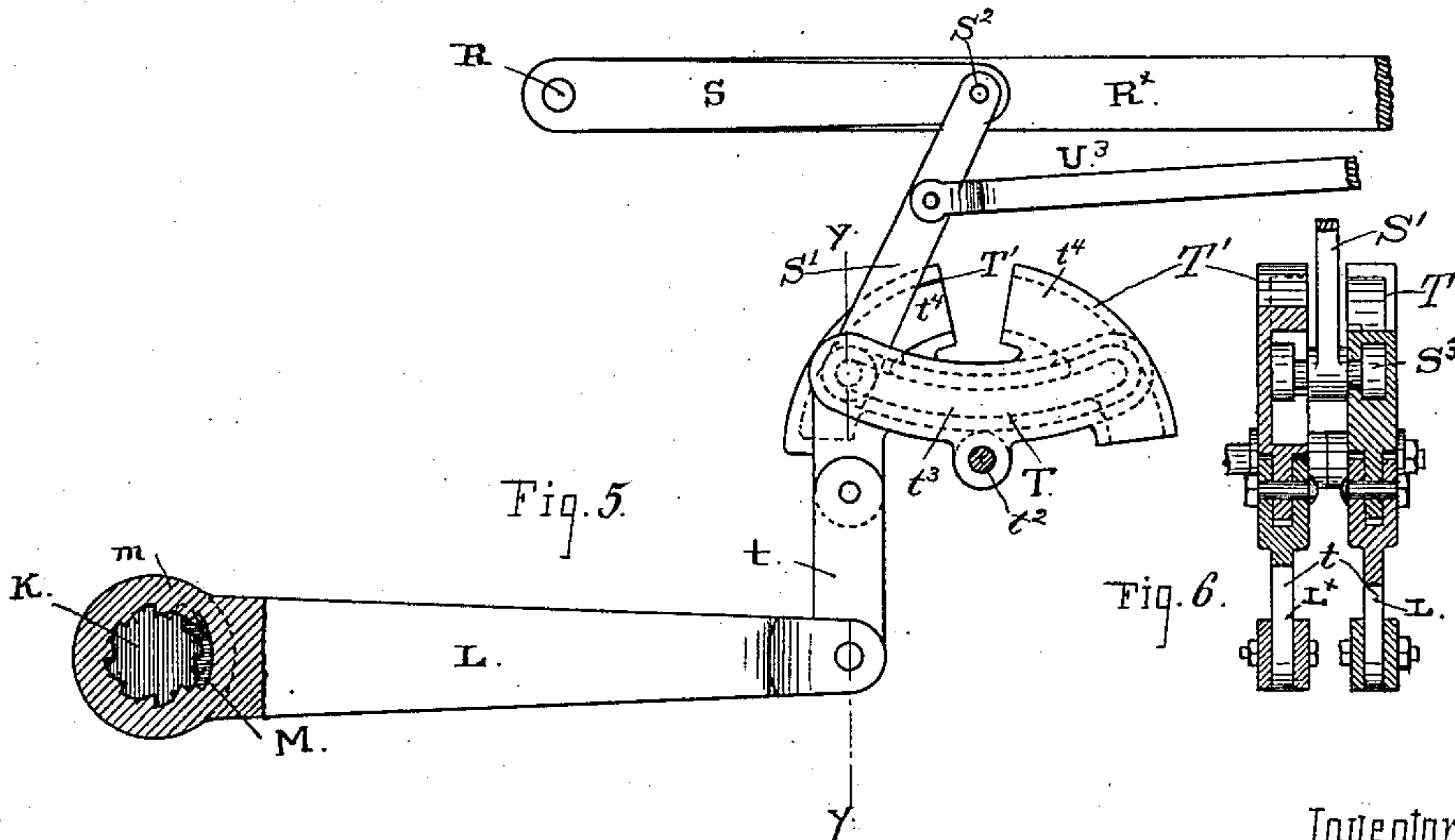
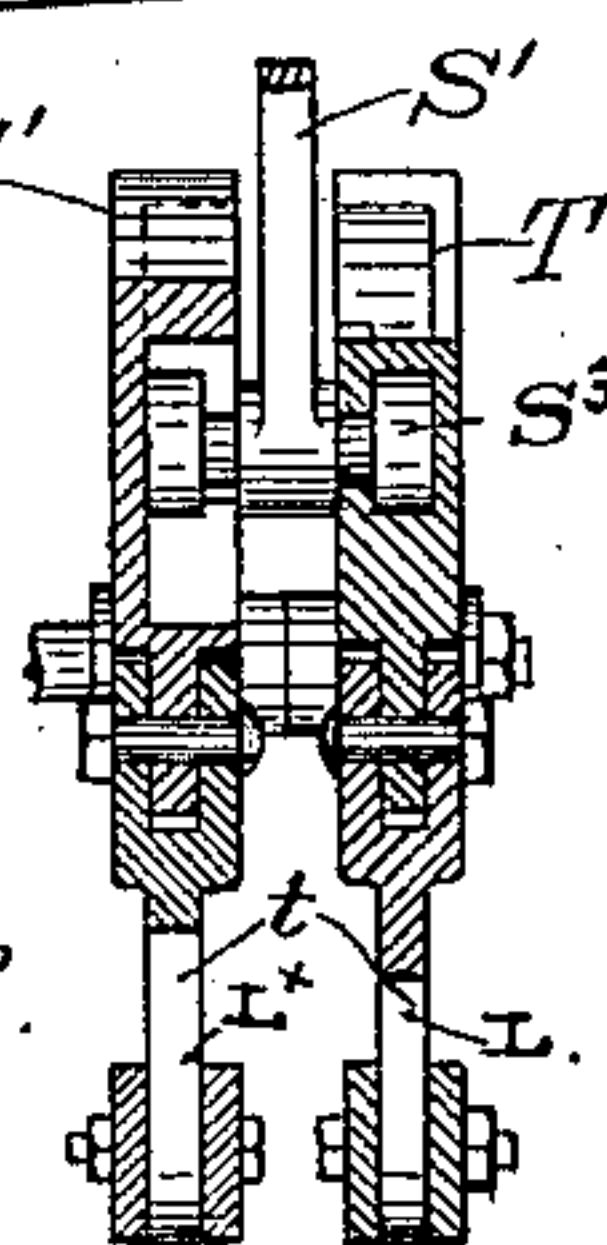


Fig. 6.



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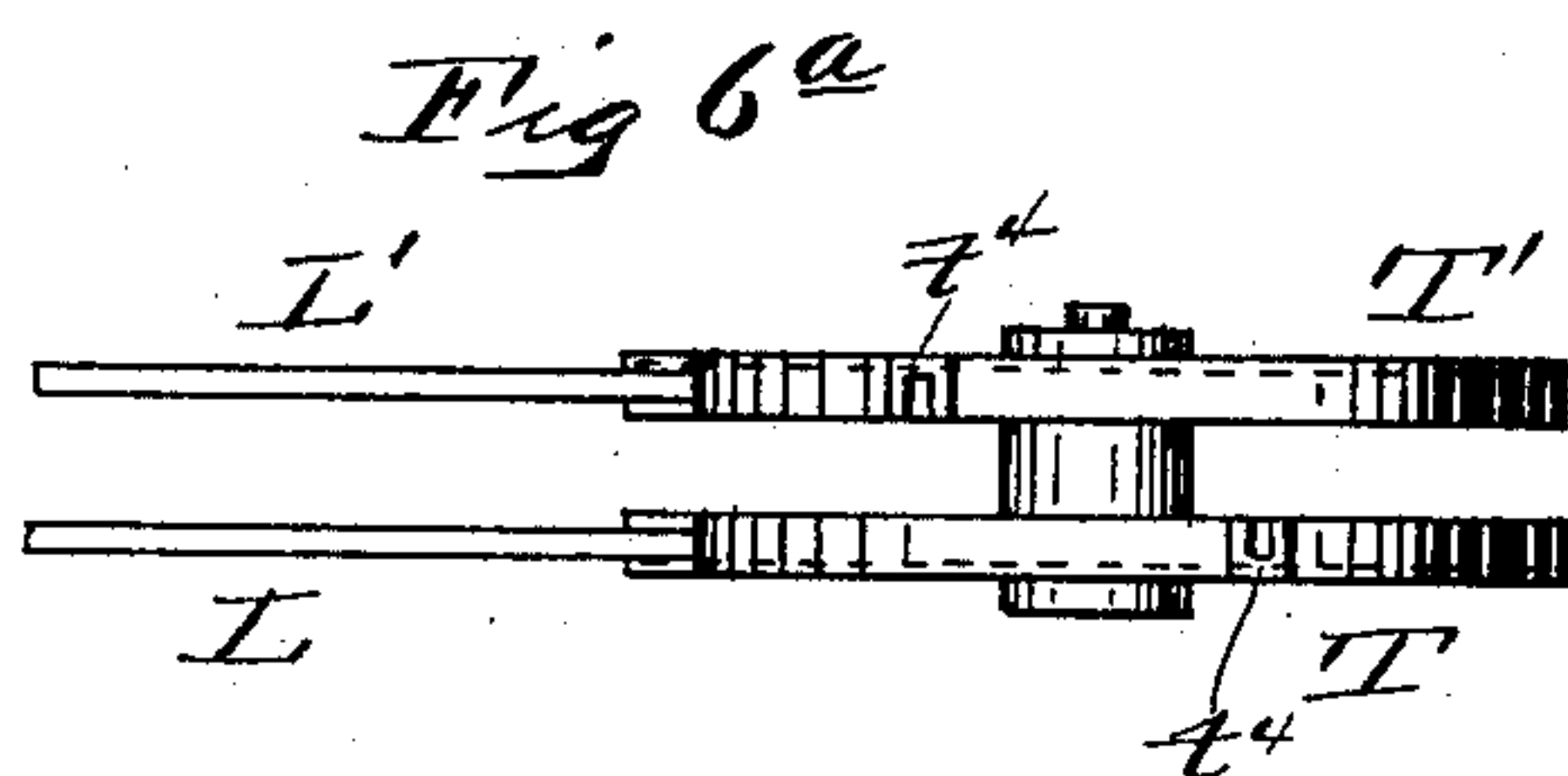
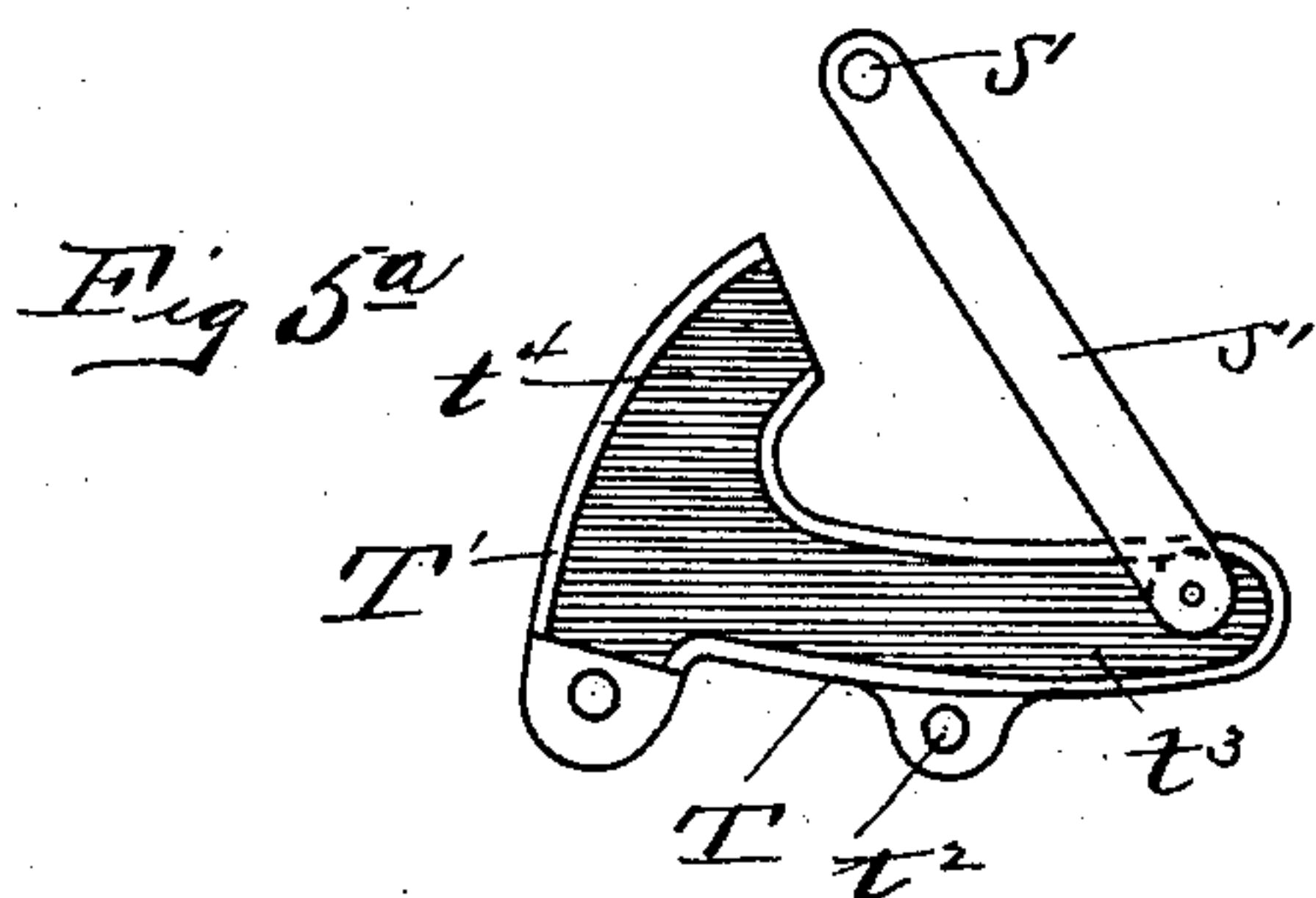
(No Model.)

3 Sheets—Sheet 3.

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POWER STREET PAVING MACHINE.

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WITNESSES

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UNITED STATES PATENT OFFICE.

FRANK A. HUNTINGTON, OF OAKLAND, CALIFORNIA.

POWER STREET-PAVING MACHINE.

SPECIFICATION forming part of Letters Patent No. 452,184, dated May 12, 1891.

Application filed December 30, 1889. Serial No. 335,364. (No model.)

To all whom it may concern:

Be it known that I, FRANK A. HUNTINGTON, a citizen of the United States, residing in the city of Oakland, county of Alameda, and State of California, have invented certain new and useful Improvements in Power Street-Paving Machines, of which the following is a specification.

My invention has for its object to produce a paving-machine for the special work of laying asphaltum, bituminous rock, and similar pavements on streets and roadways; and to such end and purpose it consists in certain novel construction and combination of parts hereinafter more fully described, producing a paving-machine for carrying on those operations of tamping, ramming, and rolling by which such material and substances are laid *en masse* for pavements, the machine having the capacity to feed or move itself along as the work progresses.

The nature of these improvements and the manner in which I proceed to construct and apply the same are explained in the following description, in which the accompanying drawings are referred to by figures and letters.

Figure 1 of the drawings represents in side elevation the complete machine embodying all my improvements. Fig. 2 is a cross-section taken through the machine on the vertical line $x x$, Fig. 1, looking toward the rear of the machine. Fig. 3 is a top view of the machine. Fig. 4 is a top view of the steering-gear in detail. Figs. 5 and 6 are views in detail of the reverse-feed mechanism, the last-named figure being a cross-section through the parts that are on the line $y y$, Fig. 5. Fig. 5^a is an elevation of the inner side of segment T. Fig. 6^a is a top view of the two segments.

The machine herein represented is constructed to roll and finish the surface of the paving material as well as to do the work of ramming or pounding, and for that purpose the rear end of the truck is mounted on the axle of a roller, which is in length about equal to the width of the machine, and is arranged to carry one end of the truck-platform, while a pair of broad tire-wheels carry the other end; but should the character of the work to be done make it desirable or more convenient to use a steam-roller or the smaller hand-rollers the rear end of the truck can be set upon wheels

of the same style as the front wheels, so that the machine will do the work of ramming the material and leave the subsequent finishing of the surface to be done by the rollers following after. The complete machine, however, is more readily handled than two independent machines, and it has the advantage of being operated by power from one engine as well as of reducing the number of workmen that the present methods of laying these pavements require.

A indicates the rammer, which is a rectangular block secured on the end of the vertical piston-rod A^x of a steam-cylinder A^2 on the truck X, and by the reciprocating movements of the carrying-rod is lifted and driven with greater or less degrees of force against the material beneath it. This rammer is worked in the same way, substantially, as a steam-hammer and is controlled in its movements by a workman on the truck. Room for an upright boiler Y and for a water-tank Z and fuel-box Z^x is provided on the truck, and also standing-room for an attendant conveniently arranged at the rear end, from which position the rammer can be controlled and the machine handled, the steering-gear and the reversing-levers of the feed mechanism being arranged at this end of the truck, also, to place the machine under complete control of one person.

When the machine is provided with a roller to follow after the rammer, such part is set in a swiveled truck B^x , having boxes b^2 for the journals of the roller B, and attached by a ring-bolt B^3 to the platform W, and a suitable steering-gear is arranged to place the roller-truck under control from the platform above, so that the roller can be turned to the right or the left on the center B^3 and the machine steered as it is moved over the work. Figs. 1 and 4 show a simple and effective hand steering-gear for this purpose, consisting of a toothed segment C, keyed on the center bolt B^3 , which is itself fixed in the roller-truck, and an upright shaft C^2 , carrying a pinion C^x in gear with the segment C under the platform. The shaft is supported by a stand C^3 , bolted down to the truck-platform, and a hand-wheel C^4 , fast on the upright shaft, furnishes the means whereby to turn it. The rammer, and also the finishing-roller when the machine is constructed to carry on both op-

erations and has such roller applied to it, is headed by the exhaust-steam from the power-cylinder, which is utilized for such purpose by providing heating spaces or chambers in the rammer-block and the roller and carrying into them the exhaust-steam from the cylinder through suitable pipes.

The connection of the rammer A with the cylinder to carry the exhaust-steam in circulation through the hollow chamber a^x is shown in Fig. 2. The tubes D D are secured at the lower ends in sockets d^x on the top of the rammer-block and communicate with the inside of the block, while their upper ends set through stuffing-boxes E^x into the steam-chests E on the back of the cylinder. These tubes slide in guides w^x on either side of the piston-rod, and in addition to their office of carrying steam into and through the rammer-block it will be seen that the tubes serve to guide the block and keep it in true position during its movements. After its course through the rammer-block the steam can be conducted into the hollow roller and further utilized before being allowed to escape by carrying a pipe F from the steam-chest E to the journal of the roller at one side of the machine, in which arrangement the roller will be provided with hollow journals, and the steam being carried into one that has the conducting-pipe F coupled to it will pass out through the opposite journal. In this construction the steam will pass down into the hollow chamber of the rammer through the right-hand tube, Fig. 2, and thence upward through the other tube into the left-hand chest, from which it is carried by the pipe F into the roller.

The tubes D play up and down with the rammer in the guides w^x and through the stuffing-boxes E^x , while the end of the pipe F sets through a stuffing-box f on the journal of the roller to permit rotation at that point.

The feed to move the machine step by step is operated by mechanism connected with the piston-rod in such manner that the truck is moved forward a short distance after each stroke of the rammer, and a reversing-gear is applied for the purpose of placing the movements of the machine under complete control. Either a pawl-and-ratchet feed or a friction-feed can be applied; but I have represented and shall describe only one form, as the special construction of this part has no novelty in itself.

Feed-ratchets K are fixed on the axles of the front wheels and one set thereof on each side of the truck just inside the wheel, the one next to the wheels having its teeth in reverse position with respect to the teeth of the other one. Rocking levers L L^x , with collars m , turn loosely on the wheel-axles in close relation to the ratchets and carry pawls M, that engage the teeth of the ratchets, the lever L in each set being arranged to give the forward feed movement and the other levers L^x to act in the opposite direction. The revers-

ing-gear T, to which each set of levers is connected by links l , is of any suitable construction and the two sets are connected to a common rock-shaft R across the platform of the truck by the arms S S on the outer ends of the shaft. Motion is given to this rock-shaft by an arm R^x , fixed on the shaft and connected at the free end with the piston-rod of the rammer by a pin p and the slot p^x , through which means the feed-levers are worked and the machine advanced or moved a short distance at the upward stroke of the piston.

The hand-lever U controls the reversing-gear and is connected to the parts of the mechanism on either side of the truck by the rock-shaft U^x , arms U^2 , and connection-rods U^3 , as shown in Figs. 1 and 3 of the drawings. This arrangement of the feed mechanism leaves clear and unobstructed space on the platform around the boiler and engine, affords easy access to the parts for cleaning and oiling, and is adapted, besides, to give a single attendant complete control of the rammer and the movements of the machine.

The rock-shaft R is moved intermittently and at every up stroke of the rammer by a lever R^x , which is connected to the piston-rod of the rammer by slot and pin p p^x , and S S are arms on the ends of the rock-shaft beyond the sides of the platform and each one carrying on the ends a rod S' . The lower end of this arm has on each side a roller-stud S^3 , and the upper end is attached by a pivot S^2 to the arm. The two separately-moving segments T T' are mounted on a common center t^2 with a space between them for the rod S' to play in and with grooves in the adjacent sides or faces, which are formed of two curves struck from opposite centers, and are of similar form in both segments, except that the groove in one is arranged in reverse position from that in the other segment. The portion t^3 of the grooves in each segment is struck from the point S^2 as a center, while the part t^4 has its center at the center of movement t^2 . One of the rollers on the rod S' sets in the groove of the segment T, while the other roller is in the groove of the opposite segment T'. Then the rod S' is set to the rear end of the groove t^3 in the outer segment T, the shaft R rocks that segment on its center, but the inside segment remains stationary, because the other roller on the end of the rod moves in that part of the groove in the segment T' which is concentric with the center t^2 . The opposite position of the rod S' brings the inner segment T' into play, while the outer one remains at rest. To each rocking segment is connected by a link t the outer end of an oscillating lever, having on the inner end a hub or collar M to play loosely on the axle of the platform-wheel and carrying a dog or pawl M, that is set to engage a ratchet-wheel K, fast on the axle. The pawl and ratchet of one lever L is arranged to work the reverse of the other lever L' , or while one acts in the up-

ward movement to turn the wheel forward the other acts at the downward movement to produce motion. This arrangement is the same for both axles, and consequently both wheels are turned by the movement of the rock-shaft R equally and simultaneously.

The two rods S' are shifted by a hand-lever u through the rock-shaft u^x , arms u^2 , and connecting-rods u^3 , arranged as shown in Figs. 1, 3, and 5.

An important feature in this machine consists in heating the rammer and also the finishing-roller, when one is used in the machine, by means of the exhaust-steam from the rammer-actuated engine, as the same forms a ready and effective mode of keeping these tools in a suitable condition to work on the material. It should be mentioned, however, that some characters or grades of these asphaltum and bituminous-rock materials useful for paving purposes are of such composition that they can be laid and manipulated at ordinary temperature, and do not require to be worked with heated tools, as they will not cake or adhere to the surface of the tool, so that in constructing this machine for special work upon such paving materials as do not call for a heated rammer this tool need not be provided with a heating-chamber, and may be a solid block, and the guide-rods D need not be hollow to serve as conducting-tubes for the steam, but can be solid rods, sliding in guides provided on the frame of the power-rammer, instead of being carried into the bottom of the steam-chest.

The rammer-block may be detachable from its rod, and thus either a hollow or a solid block may be worked in the same machine.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A power paving-machine for laying asphaltum, bituminous rock, and similar paving material, having a steam-actuated rammer which is heated by steam from the actuating-engine of the rammer, as set forth.

2. A power paving-machine for laying asphaltum, bituminous rock, and similar paving material, having a steam-actuated rammer which is heated by steam from the actu-

ing-engine of the rammer, and a finishing-roller adapted to operate upon the material behind the rammer, and having a heating space or chamber inside which is connected with the steam-supply of the machine, as set forth.

3. In a power paving-machine for laying asphaltum, bituminous rock, and similar pavements, the combination of a wheeled truck or platform and boiler mounted thereon, vertically-acting rammer having a head or block beneath the platform, a finishing-roller adapted to carry one end of the platform and to operate after the rammer, a steering device by which the platform is controlled, and a mechanical feed mechanism connected with the reciprocating rod of the rammer to be actuated by or at the upward movement of the rammer to move the machine automatically step by step when the rammer is raised from the ground, substantially as described, for operation as set forth.

4. The combination of the power-rammer, wheeled truck-engine, and feed device applied to the wheels of the truck to produce step-by-step movement, as described, and having connection with the reciprocating rod of the rammer, to be actuated by the same power that works the rammer and in the intervals of time when the rammer is on the upstroke, the said feed having reversing mechanism by which the machine may be moved forward or backward at any point in the progress of the work, as set forth.

5. A power paving-machine for laying asphaltum, bituminous rock, and similar pavements, having a power-rammer and a finishing-roller mounted for operation on the same truck, and a step-by-step feeding device applied to the wheels of the truck and connected with the rammer-operating mechanism, substantially as described, whereby the rammer and roller are moved over the surface automatically as the work progresses.

In testimony that I claim the foregoing I have hereunto set my hand and seal.

FRANK A. HUNTINGTON. [L. S.]

Witnesses:

EDWARD E. OSBORN,
J. H. BLOOD.