

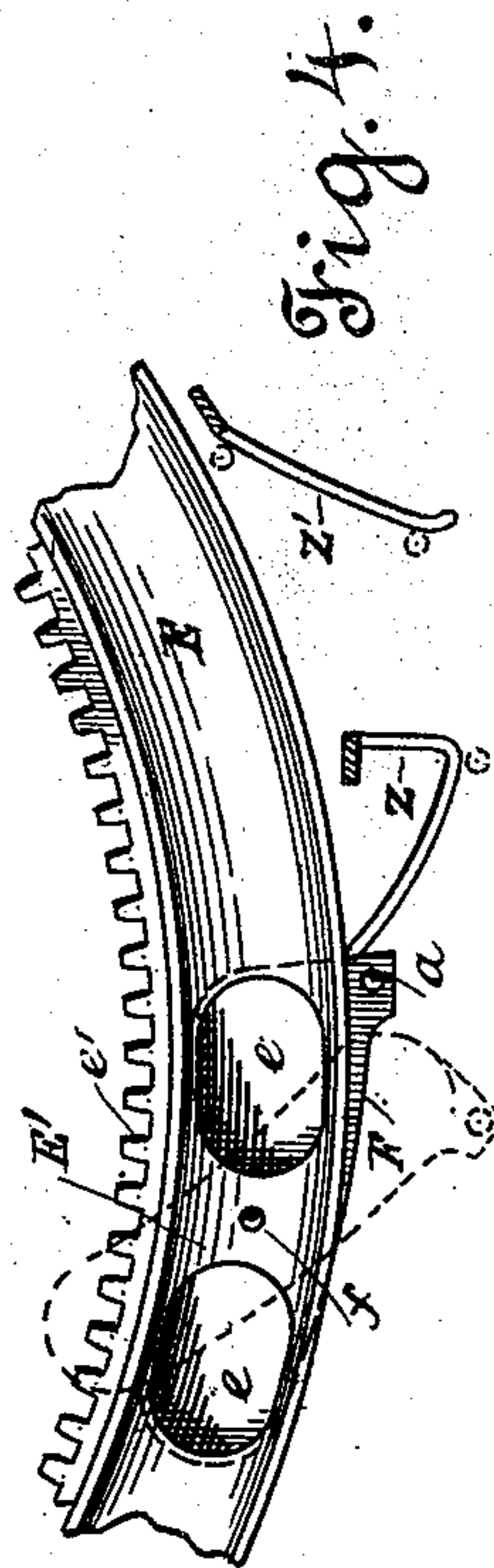
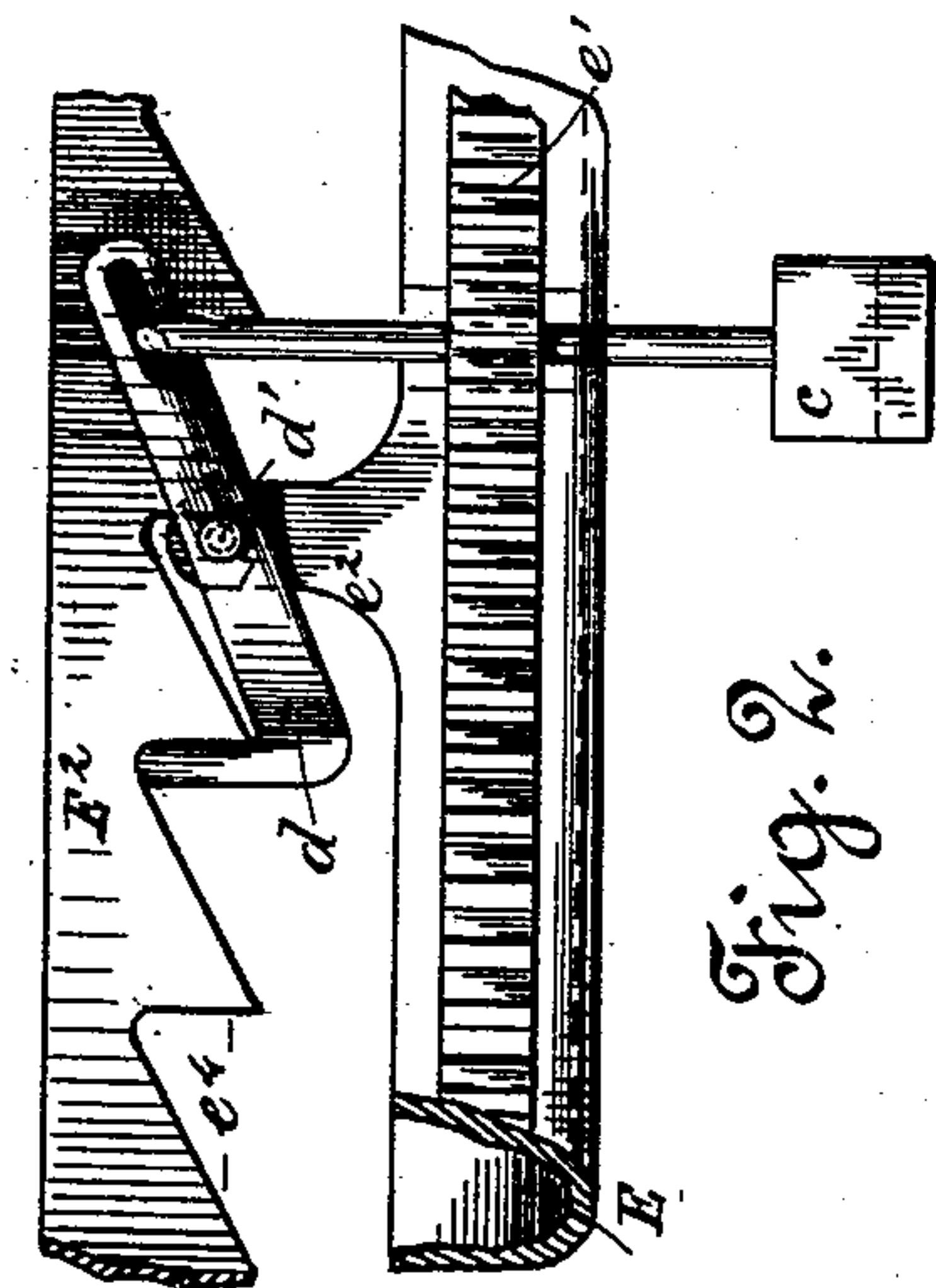
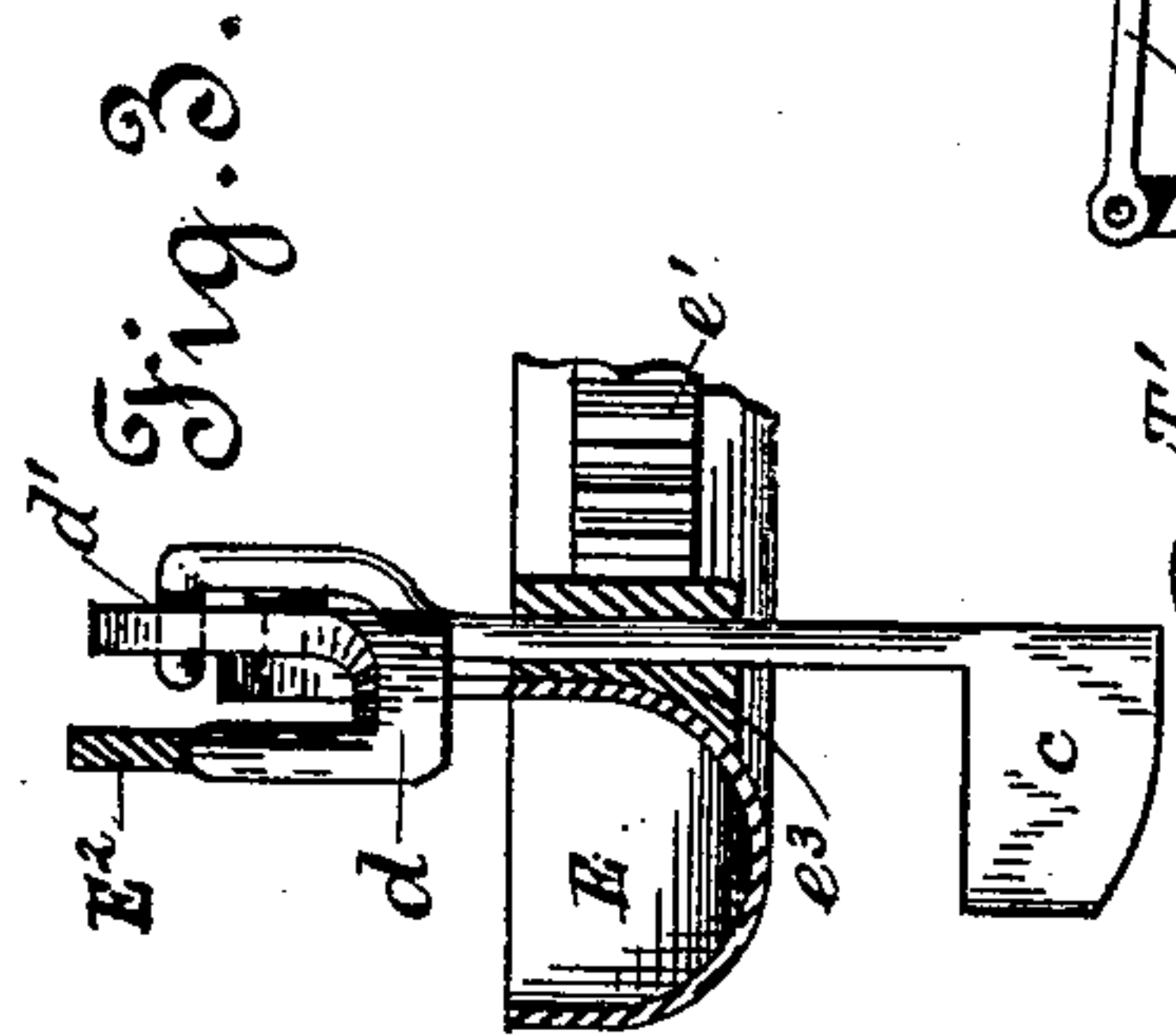
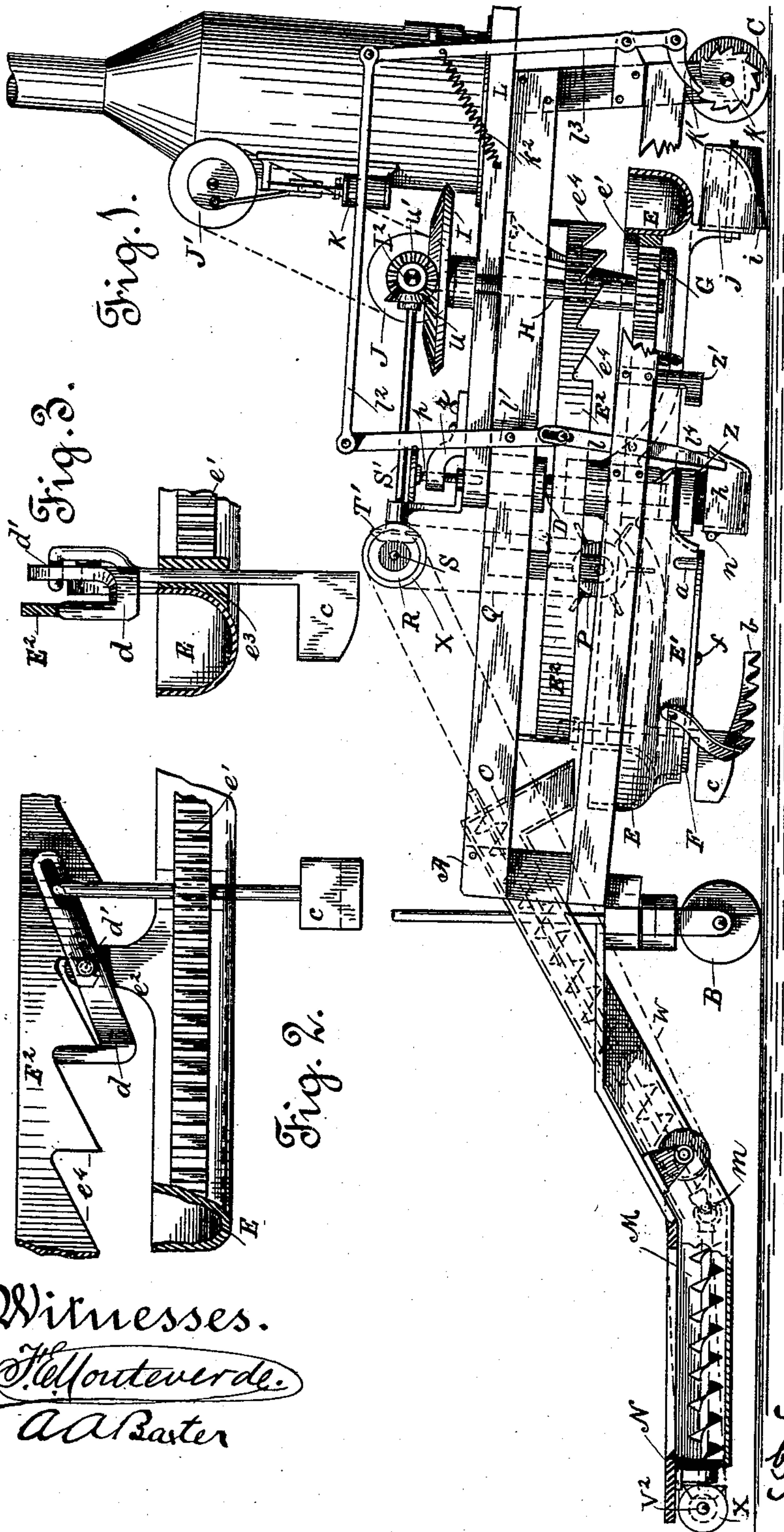
(No Model.)

2 Sheets—Sheet 1.

R. J. CARSON.
PAVING MACHINE.

No. 509,117.

Patented Nov. 21, 1893.



Witnesses.

J. Houteverde.
A. A. Baster

Inventor.

R. J. Carson
by *A. H. Le Marie*
att'y

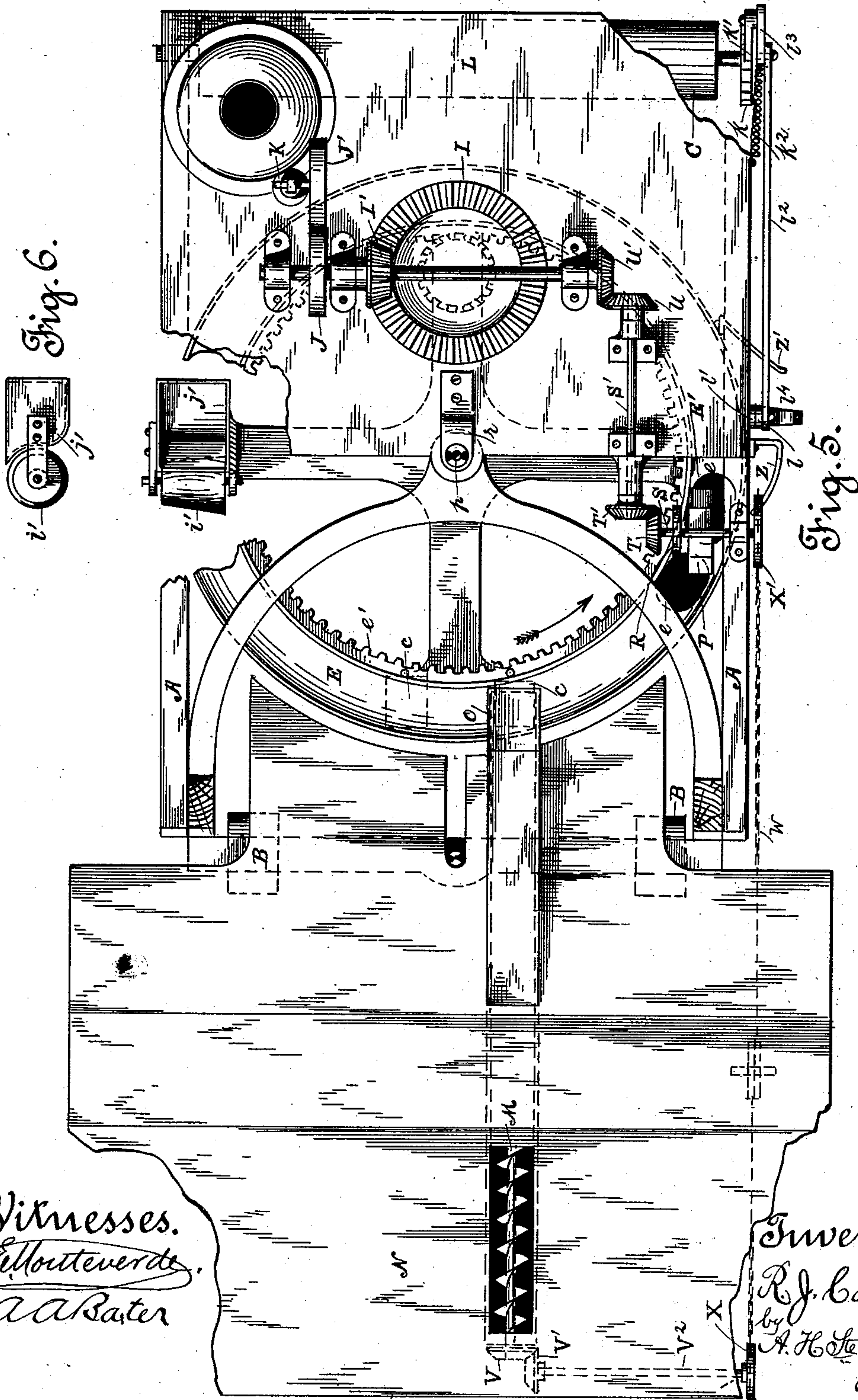
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

ROBERT J. CARSON, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-HALF TO GUISEPPE DELFINO, OF SAME PLACE.

PAVING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 509,117, dated November 21, 1893.

Application filed September 1, 1892. Serial No. 444,738. (No model.)

To all whom it may concern:

Be it known that I, ROBERT J. CARSON, a citizen of the United States, and a resident of the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Paving - Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in machines employed for laying down street pavements, especially that class in which asphalt forms the upper layer or surface, and the object of my improvements is to provide a machine which will perform promptly and in rapid succession the various operations required to be performed in putting down and shaping the different strata composing a pavement—such as distributing the prepared material, spreading, tamping, heating, rolling, compressing and smoothing it—and which will advance of itself along the street to be paved as the work progresses.

With this end in view, I have devised a self-propelling machine equipped with tools and implements usually employed to carry on the work referred to and consisting of a conveyer to bring the paving material, a distributor to deposit it at the requisite points, a rake to spread it to the proper thickness, tampers to compact it, fire-boxes to keep it in a hot state if required, and rollers to further press it down and smooth it, the whole constructed and combined as hereinafter more fully set forth and pointed out in the claims.

Referring now to the accompanying drawings, Figure 1 is a side elevation, partly broken, of the whole machine. Figs. 2 and 3 are detailed views in elevation of part of the distributing apparatus and tampers connected therewith. Fig. 4 is a plan of another portion of the distributor, showing the outlets for the paving material, the gate controlling these outlets, and the opening and closing devices for said gate. Fig. 5 is a partly-broken plan of the entire machine; and Fig. 6 is a detailed

view in elevation of one of the rollers and fire-boxes carried by the distributor.

Similar parts are indicated by similar letters of reference in all the views.

A represents the frame-work of the machine, which is mounted on wheels B and one or more rollers C, so that it may be moved easily from one place to another. Rollers are preferred to wheels for the rear part of the machine because helping to finish the pavement, as will be explained further below.

Upon a vertical shaft D, within the frame A, is mounted an annular trough or distributor E adapted to carry and portion the material entering into the composition of the pavement, which it drops at regular intervals on the street to be paved, through apertures *e* formed in the bottom of a reservoir E' and normally kept closed by a gate F. The trough E is revolved by means of an annular gear-wheel *e'*, engaged by a pinion G, at the lower end of a vertical shaft H, which is rotated through bevel gears I I', a horizontal shaft I², and pulleys J J', by an engine K located on a platform L upon the rear end of the frame-work.

The paving material is fed to the trough by a rotary or screw-conveyer M placed at the forward part of the machine. By preference, this conveyer is made in two parts united by a universal joint *m*, as shown, one part lying in a horizontal position beneath a platform N, and the other rising at an angle therefrom, and leading to a chute O placed above the trough. Upon falling out of this chute the material is carried by the trough as far as rotary stirrers P, where it is forced into the reservoir E' and thence dropped onto the ground by opening the gate F. The stirrers P are connected by gearing to the actuating mechanism, as, for instance, by a belt or chain Q, a pulley R, and shafts S S' connected one with the other by bevel-gears T T', and with the shaft I², previously mentioned, by similar gears U U'. As to the conveyer, it may be rotated through the medium of miter-gears V V' and a shaft V² connected by belt or chain, W, and pulleys X X' to the shaft S. The gate F swings on a pivot *f* and is made to close and uncloze the apertures *e* by means of studs Z Z' secured to the sides of the frame

A. The stud Z engages with the inner side of a catch or stud a on the end of F and opens the gate, whereas the stud Z' operates to close it by engaging with the outer side of the same catch.

The material distributed by the trough is spread out on the ground by means of a rake b secured to and carried around with the trough. The teeth of this rake are preferably inclined and arranged to lay out the pavement in substantially semi-circular and more or less inwardly-inclined sections, the incline of each layer being more or less pronounced in proportion as the free end of the rake is inclined toward the ground.

Tampers c are provided to compress or tamp the material as soon as it is spread out by the rake. These are also carried around with the annular trough, being suspended from one end of a lever d , which is pivoted at d' to a lug e^2 projecting upwardly from the inner side of the trough. The stems of the tampers pass vertically through a block e^3 , also secured to the inner wall of the trough E , and are worked up and down by means of the other end of the lever d , which is curved upwardly so as to engage with the downwardly-projecting teeth e^4 , of a circular band or ring E^2 rigidly secured to the frame of the machine above and concentrically with the annular trough. The under side of the tampers is preferably beveled or rounded so as to pack the paving material in inclined layers as previously formed by the rake.

h represents a fire-box or pot, which is secured to the trough either in front or back of the rake and is utilized when laying down asphalt, bituminous rock or other fusible material, the object being to keep such material hot while working it. Several such boxes or pots may be used, that is to say, as many as are needed to heat the trough, the tampers and other working parts of the machine. These fire-boxes or pots may be constructed in any suitable way and combined with the machine and its tools or implements in any convenient manner.

i i' are rollers, also secured to and carried round with the trough, and used to press down and smooth the surfaces of the layers composing the pavement after they have been spread out and tamped. These rollers are preferably made conical in order to work the layers of paving material after the manner of the rake and tampers. Fire-boxes or pots j j' are used in connection with them when laying down an asphalt or similar pavement. The hind-roller C , may also be heated, if desired, when laying down pavement of the latter class, by means of steam pipes, or by any other convenient method.

The whole machine is moved forward, as fast as each stratum composing the pavement is being laid down, by means of a ratchet-wheel k secured to the axis of the roller C on which the rear part of the machine rests, and a pawl k' worked by a series of levers l , l' , l^2 ,

l^3 . These levers are so fulcrumed and arranged that a stud n meets their free end at each revolution of the trough and causes them to operate the pawl and turn the ratchet-wheel, thereby turning the hind-roller, further compressing and smoothing the section of pavement newly laid down, and driving the entire machine ahead. The stud n having been forced past the free end of the lever l , a spring k^2 reverses the position of the several levers and causes the pawl to slip back one or more teeth in readiness for another move forward. The machine may thus be arranged to advance more or less rapidly at each turn of the annular trough, or even intermittently, if preferred, by making obvious changes in the actuating mechanism. The lower end of the lever l is curved outwardly at l^4 so as not to interfere with the gate F , and the stud n is, of course, made sufficiently long to reach it. The stud n may be secured either to the side of the fire-box h , as shown in Fig. 1, or to any other suitable part of the machine.

p represents a screw, which is fitted in a suitable bracket r and connected with the trough in such a way as to raise and lower it at any convenient distance from the ground, together with the tools or implements which it carries.

It will be observed that several reservoirs may be provided in the trough, and as many charges of material dropped at various points on the street at each revolution of the trough. Two or more rakes may also be used. The number of the tampers, rollers, fire-pots, and in fact all of the tools and implements used in connection with my improved machine may likewise be increased. So is it advisable to use two machines instead of one for crowning purposes, especially when the street to be paved is a wide one, as the crowning can well be accomplished only by running two machines on parallel lines, one by the side of and somewhat behind the other. The two machines, it will be understood, may be operated by the same engine, with a suitable change in the driving gear. These and many other modifications which will naturally suggest themselves to a person skilled in the art to which my improvements belong fall within the scope of my invention. I therefore do not confine myself to the exact number and arrangement of the various parts composing the above-described paving-machine nor to the precise details of construction hereinbefore set forth.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a paving machine, the combination of an annular distributor, means for rotating the same in a horizontal plane, means for supplying material thereto, and means for spreading the material deposited thereby.

2. In a paving machine, the combination with an annular distributor, of a conveyer ex-

tending above the distributor, and a chute secured to the upper end of the conveyer and terminating over the distributor.

3. The combination with the revoluble trough or distributor having apertures in its bottom, of a gate adapted to normally cover said apertures, and mechanism for automatically opening and closing said gate during the revolution of the trough.

4. The combination, in a paving-machine, of a revoluble trough or distributor provided with apertures, a pivoted gate controlling said apertures, a catch or stud on said gate, a device adapted to engage with the inner side of said catch or stud and thereby open said gate, and a similar device adapted to close the gate by engaging with the outer side of the catch or stud, substantially as set forth.

5. The combination, in a paving-machine, of a revoluble trough or distributor, and a rake revoluble therewith, substantially as set forth.

6. The combination with a paving-machine constructed so as to deposit and spread out paving material, of tampers adapted to compress or compact such material, substantially as set forth.

7. The combination, in a paving-machine, of a revoluble trough or distributor, and tampers revoluble therewith, substantially as set forth.

8. The combination, in a paving-machine, of a revoluble trough or distributor, and a rake and tampers revoluble therewith, substantially as set forth.

9. In a paving machine, the combination of a distributor, and rollers carried by said distributor and adapted to press down and smooth the material deposited thereby.

10. The combination, in a paving-machine, of a revoluble trough or distributor, and rollers following the course thereof, substantially as set forth.

11. The combination, in a paving-machine, of a trough or distributor, a rake, tampers, and

rollers, the whole combined and operating substantially as set forth.

12. A paving-machine having conical rollers, substantially as and for the purpose set forth.

13. The combination, in a paving-machine, of a distributor, an inclined rake, beveled tampers, and conical rollers, substantially as and for the purpose set forth.

14. The combination, in a paving-machine, of a distributor, means to work the material deposited by said distributor, and fire-pots or boxes, substantially as set forth.

15. The combination, in a paving-machine, of a trough or distributor, a rake, tampers, rollers, and fire-pots or boxes, substantially as set forth.

16. The combination with the annular distributor having escape openings in its bottom, and means for revolving said distributor horizontally, of a stirrer arranged vertically over the said distributor, and means for rotating the stirrer.

17. The combination, in a paving-machine, of an annular trough or distributor, an indented ring or annular band, tampers, and a lever connected with said tampers and adapted to raise and lower the same by running along the indentations of said ring or band, substantially as set forth.

18. The combination, in a paving-machine, of a distributor moving in a circle, tools or implements, such as rakes, tampers, rollers and fire-pots, revoluble therewith, and one or more hind-rollers moving in a straight plane across the path described by said distributor and said tools or implements, substantially as set forth.

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

ROBERT J. CARSON. [L. s.]

Witnesses:

A. A. BAXTER,
D. M. KENNEDY.