

No. 719,492.

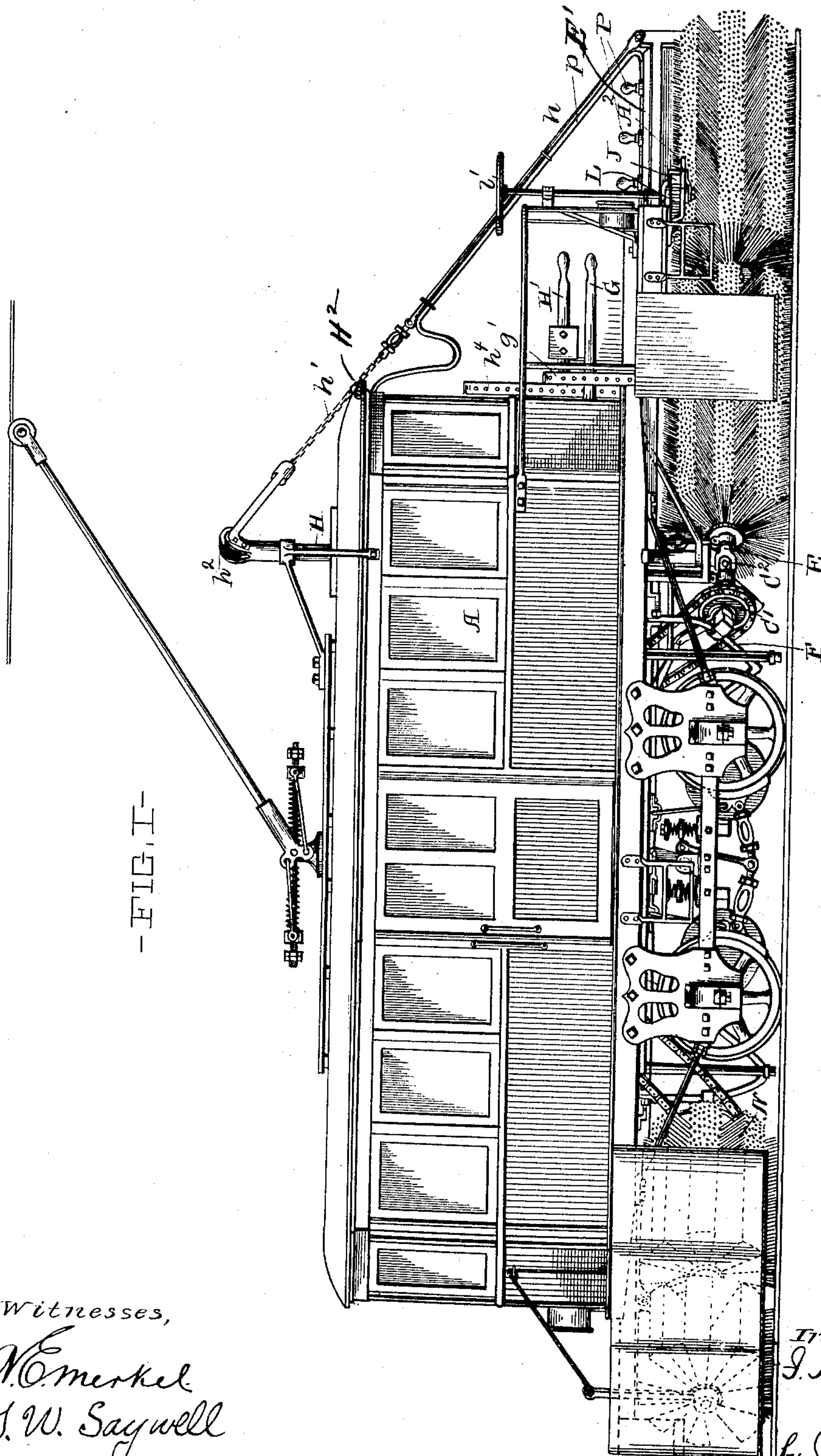
PATENTED FEB. 3, 1903.

I. A. McCORMACK.
STREET SWEEPING DEVICE.

APPLICATION FILED JULY 1, 1901.

NO MODEL.

4 SHEETS—SHEET 1.



Witnesses,

W. Merkel
H. W. Saywell

INVENTOR,
J. R. McCormack

by J. D. Fay
Atty.

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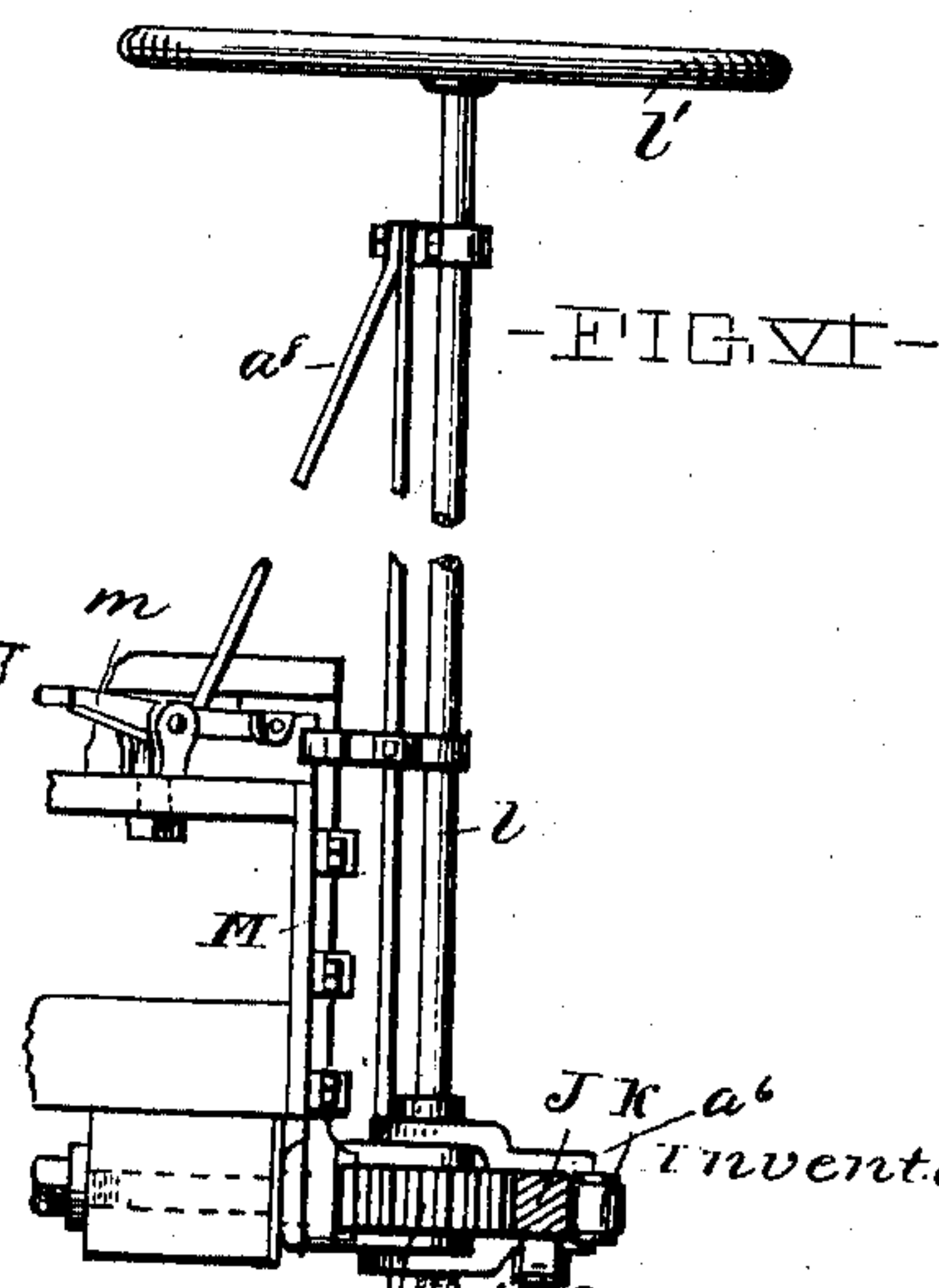
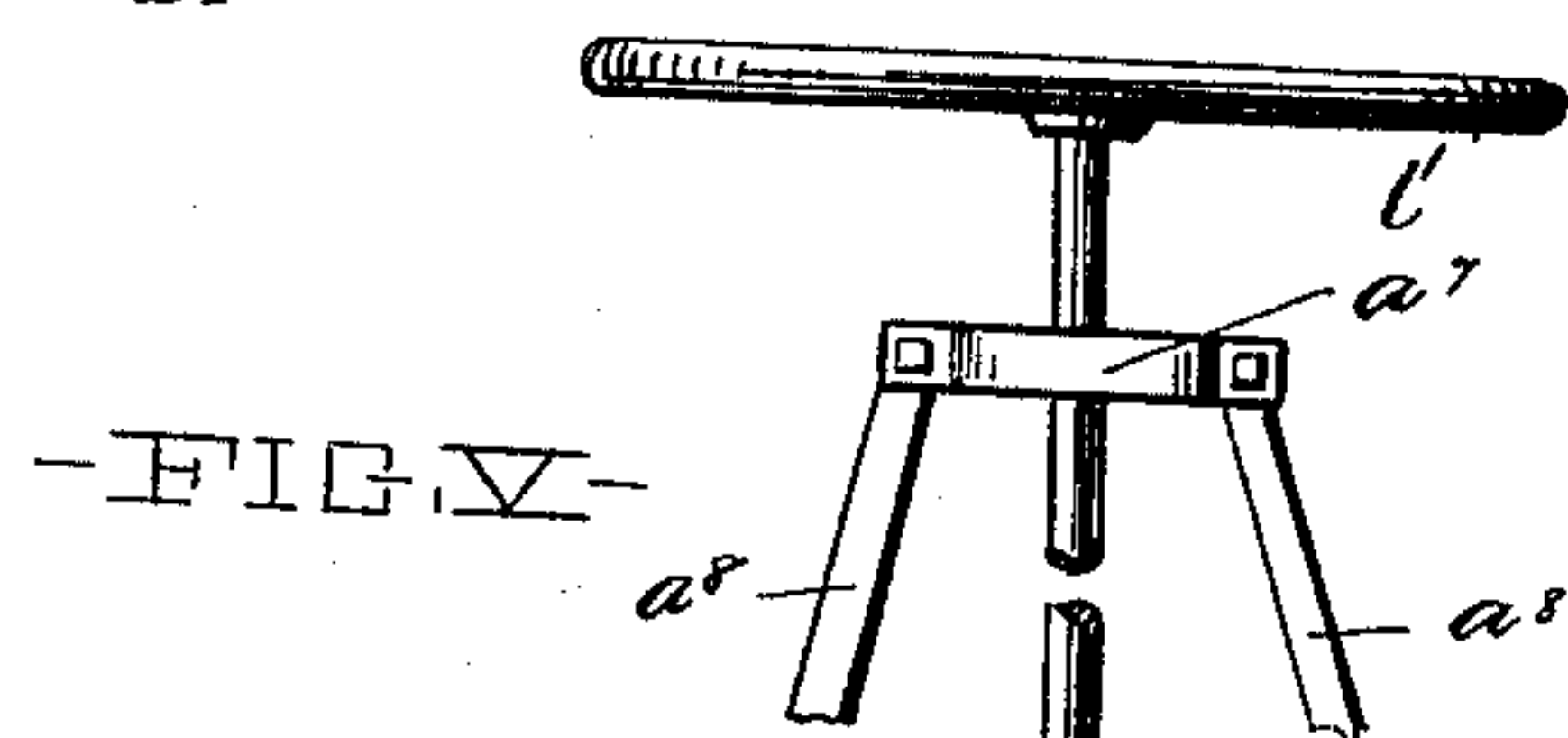
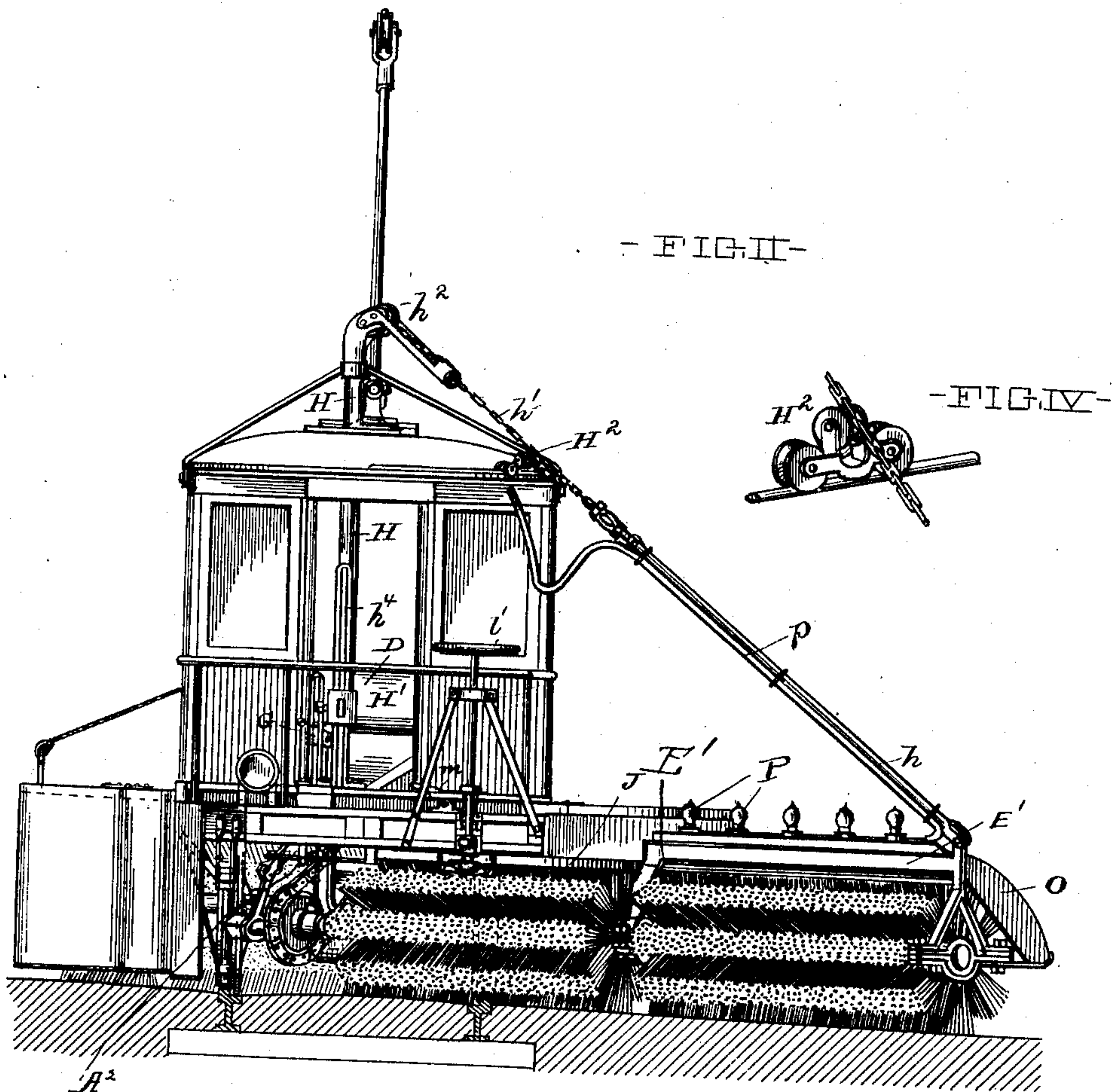
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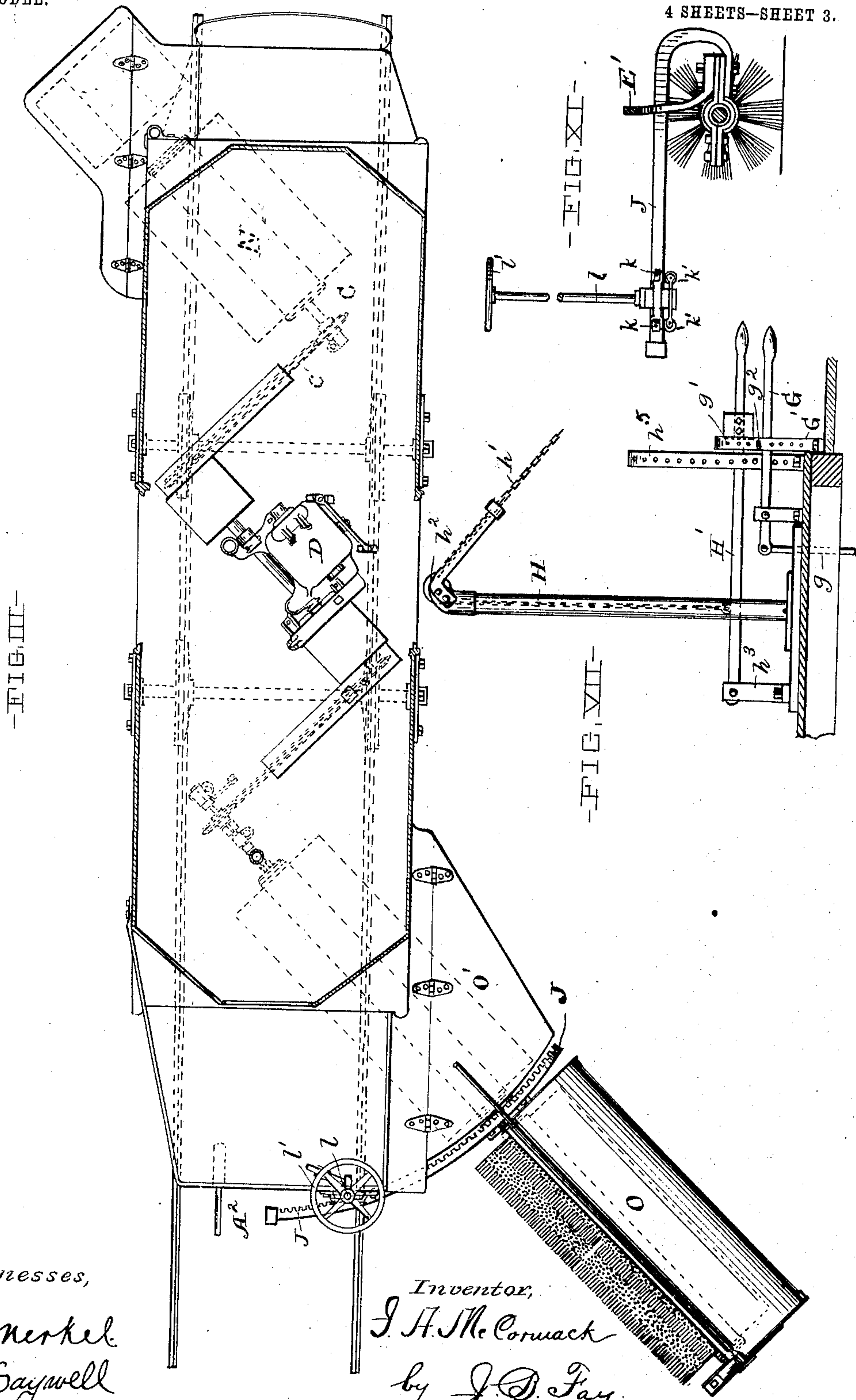
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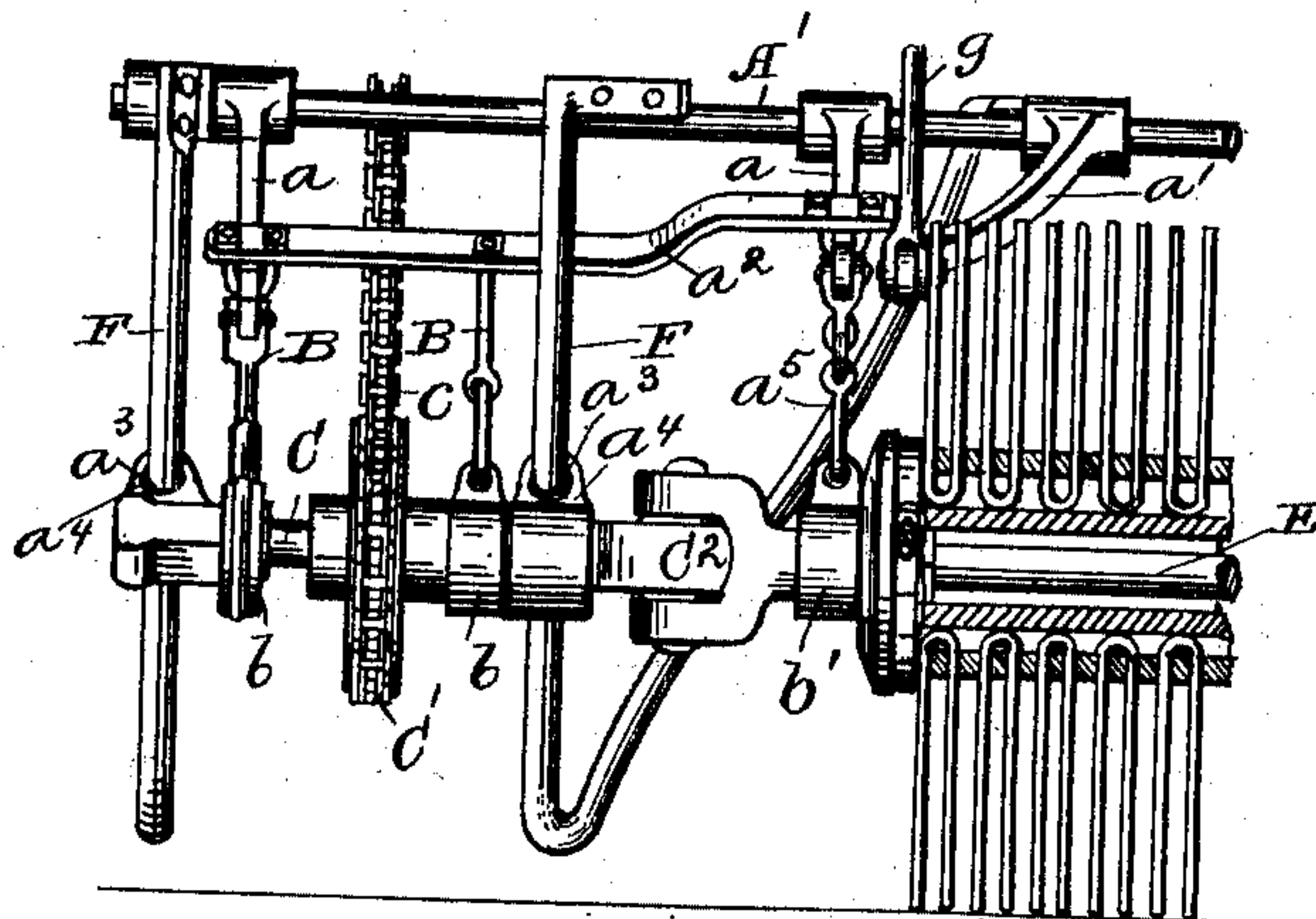
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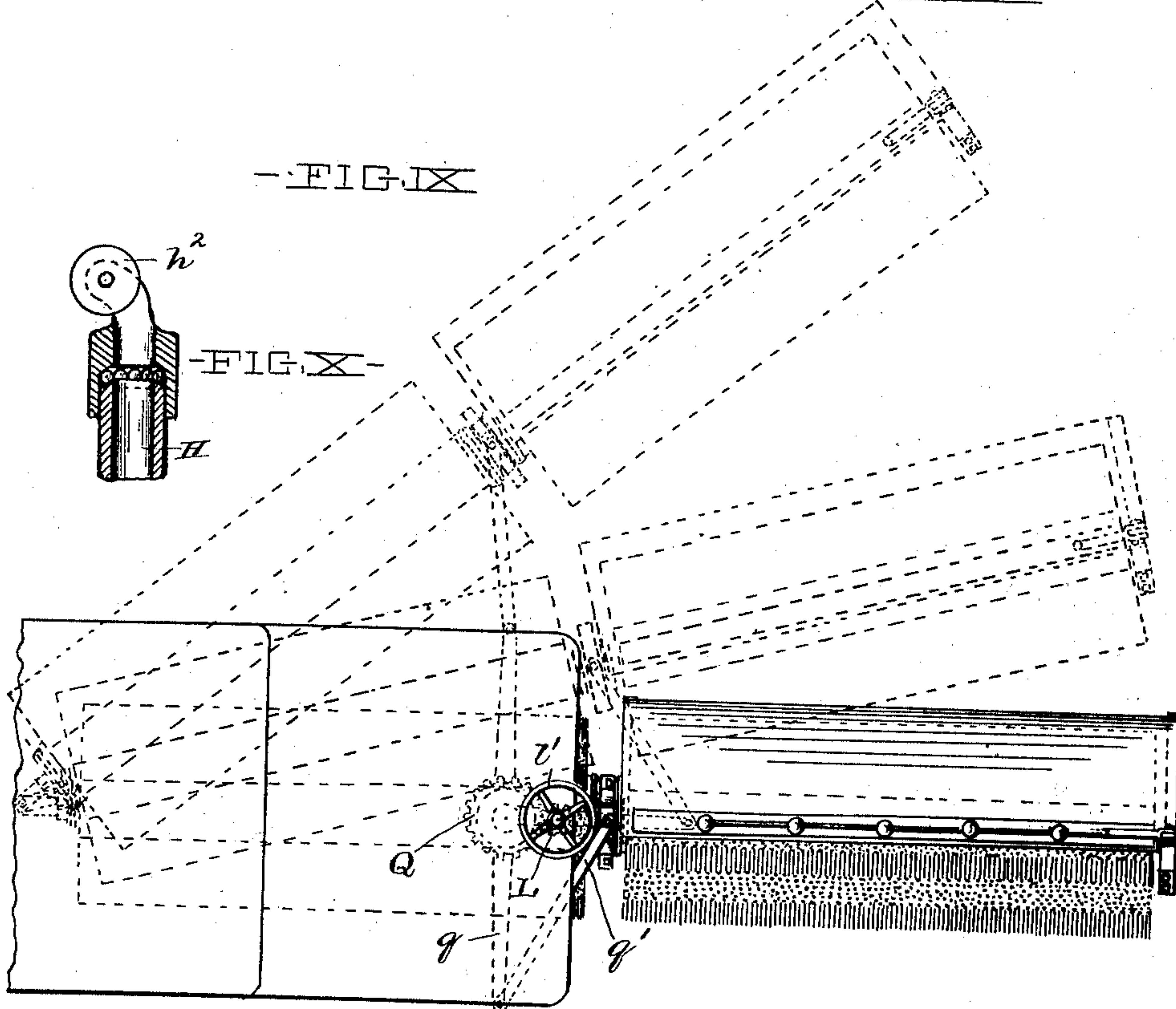
NO MODEL.

4 SHEETS—SHEET 4.

—FIG. VIII—



—FIG. IX—



Witnesses,

A. C. Merkel
G. W. Saywell

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UNITED STATES PATENT OFFICE.

IRA A. McCORMACK, OF CLEVELAND, OHIO.

STREET-SWEEPING DEVICE.

SPECIFICATION forming part of Letters Patent No. 719,492, dated February 3, 1903.

Application filed July 1, 1901. Serial No. 66,899. (No model.)

To all whom it may concern:

Be it known that I, IRA A. McCORMACK, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a certain new and useful Improvement in Street-Sweeping Devices, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention relates to devices for sweeping streets, its particular object being to provide a structure adapted to be operated over an electrically-operated surface street-railroad.

Said invention consists of means herein-after fully described, and specifically set forth in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings, Figure I represents a side elevation of an electrically-propelled motor-car embodying in its structure my street-cleaning invention. Fig. II represents a rear end elevation of same. Fig. III represents a horizontal section of such car, illustrating a plan of the location of various elements of my invention. Fig. IV represents an enlarged detail perspective view of a traveling carriage employed in said structure. Fig. V represents an enlarged broken detail end elevation of the means for effecting a pivotal movement of the main or primary broom of the sweeping device. Fig. VI represents, on the same scale, a side elevation of the parts illustrated in Fig. V. Fig. VII represents a detail view of the means for raising and lowering said main or primary broom. Fig. VIII represents an enlarged detail elevational view of the mechanism intermediate of the broom-operating motor and the broom-shaft, showing a sectional portion of the broom in addition. Fig. IX represents a diagrammatic plan view of a motor-car, illustrating the principle of construction of a modified form of my invention. Fig. X represents an enlarged detail section of the

top of the mast, which forms a support for the outer broom end. Fig. XI represents a detail view of the rack-segment and connected parts used in my invention.

Hung in hangers suitably secured to the bottom of the rear portion of the motor-car A is a rock-shaft A', Fig. VIII, upon which are secured two rocker-arms *a a* and an operating-arm *a'*. Secured to the outer ends of said rocker-arms is a cross-bar *a²*, from two different points of which depend two links B, to whose lower ends are secured, respectively, two journal-bearings *b b*, in which is journaled a driving-shaft C. Intermediately of said bearings is secured upon said shaft a sprocket-wheel C', which is driven by means of a sprocket-chain *c*, which in turn is driven by a sprocket-wheel mounted upon the shaft of a driving-motor D, which is angularly mounted upon the floor of the car. To the outer end (right-hand end as illustrated in Fig. VIII) is secured, through the medium of a universal joint C², the inner end of the broom-spindle E, which extends outwardly from beneath the car-body, as shown, and is supported and operated in a manner hereinafter fully described. Two guides F F, preferably constructed of round steel rod, are secured to the bottom of the car-body and are bent upon the arc of a circle, Fig. I, having its center upon the line of axis of the rock-shaft A'. These guides pass through two eyes *a³*, formed in lugs *a⁴*, suitably mounted upon the driving-shaft, as shown in Fig. VIII. These guides serve to prevent lateral displacement of the above-described mechanism in the upward or downward movement thereof attending the oscillation of the rock-shaft A'. From a third point in said bar *a²*, Fig. VIII, depends a link *a⁵*, secured to a journal-bearing *b'*, mounted upon the inner end of the broom-spindle. As will be readily understood from the above-described construction, the inner end of the broom-spindle, and hence the broom, may be raised and lowered by oscillating the shaft A'. Such oscillation is effected by means of an operating-lever G, connected with the arms *a'* through the medium of a link *g*, the position of such lever being capable of variable determination by means of a stand G', provided with a central slot and a series of transversely-located holes *g'* and a removable pin

9², Fig. VII. The outer end of the broom-spindle is journaled in the end of a yoke-frame E', and upon the outer end thereof is journaled the end of a supporting-rod h, the opposite extremity of which is secured to the end of a flexible chain h', which runs over a pulley h², rotatably mounted, preferably by means of an antifriction-bearing, Fig. X, upon the top of a hollow stationary mast II, secured to the car-floor and passing through the car-roof. The other extremity of such chain is secured to an operating-lever II', fulcrumed upon a standard h³ and passing through a slot h⁴, formed in the lower mast portion, Fig. II. The position of said lever, and hence the outer broom end, is also capable of variable determination through the medium of a stand h⁵ and removable pin similar to that previously described. Where conditions are such as to limit the distance of projection of the mast above the car and such limitation causes the chain to contact the contiguous roof edge, a running carriage II², having a roller over which the chain is caused to pass, is provided, a track being suitably secured to the car-roof and forming a runway for said carriage. Such construction facilitates the movement of the pivotal broom hereinafter described. It is hence seen that the broom is capable of being simultaneously rotated, angularly or pivotally moved in a horizontal plane, and raised and lowered, and that the broom-spindle extremities are capable of being simultaneously raised or lowered or raised or lowered independently of each other. By employing such above-described construction, wherein each broom end may be raised or lowered independently of each other, the broom may be caused to incline downwardly from its inner to its outer end or inclined downwardly from its outer toward its inner end or made to assume a perfectly horizontal position, as may be required by varying conditions or as may be required by a non-uniform wearing of the broom-bristles. The broom is divided into two sections, as shown, the line of division coinciding substantially with the end of the car. At such point the spindle is journaled in the inner end of the yoke-frame E', and secured to said end is a segmental rack-bar J, which is downwardly and inwardly bent, as shown in Fig. XI, such inwardly-bent form being adopted in order to permit of the required range of pivotal movement of the broom in an inward direction, as will further appear. An antifriction-bearing consisting of two rollers k is secured to the rear end of the car, Figs. V and VI, preferably to the hanger a⁶, which is provided for forming a bearing for the lower end of a shaft l, hereinafter described. Said bearing is provided for receiving the rearward thrusts of the segment J when vibrated by the movement of the broom over the pavement. A second bearing consisting of two rollers k' k' is provided and similarly mounted for receiving the downward thrusts of such segment when so vi-

brated. The rack-teeth are formed upon the inner or concave side of the rack-bar and mesh with an operating-pinion L, secured to the lower end of an upright shaft l, provided with a hand-wheel l', having its lower end journaled in said hanger a⁶ and its upper end journaled in a bearing a⁷, supported by braces a⁸ a⁸, secured to the car. It is hence seen that the angular movement of the broom may be effected by turning the hand-wheel l', and it is further seen that by reason of the above-described inwardly-curved construction of the rack-bar the broom may be brought into a position parallel with the car when it is so desired. For supporting the free end of the rack-bar during such described position of the broom an elongated roller A², Figs. II and III, is provided and suitably secured to the rear car portion, as shown. In order to lock the rack-bar at various points in the path of its movement and then fix the angular position of the broom as desired, I provide a fork M, whose tines are capable of insertion in spaces between the rack-teeth and which may be raised or lowered, and hence rendered operative or inoperative, as desired. A pedal m is connected with the stem of the fork for facilitating such operation.

The above-described broom is swung out angularly into the position illustrated in Fig. III during its operation upon the street to be cleaned, the degree of angularity depending upon the width of that part of such street upon the right-hand side of the track, and may be swung in behind the car during the movement of the latter to avoid obstructions or for the purpose of adjustment according to the width of said street portion. The driving-motor D is connected so as to be operable independently of the car-propelling motor or the car-wheels, whereby, it is seen, the broom and car may be operated at any desired speed independently of each other, a characteristic which permits of great economy of operation, since the broom may be given a speed best adapted to a given rate of speed of the car and to varying working conditions determined by the particular character of the work to be done in order to secure greatest efficiency.

Secured beneath the forward end of the motor-car is an auxiliary angularly-fixed broom N, which extends laterally in a direction opposite to that in which the primary broom extends and is utilized for sweeping that portion of the street to the right of a line midway between the two tracks of a double-tracked road, which is not traversed by the primary broom. The inner extremity of the space swept by the auxiliary broom is caused to overlap that of the space swept by the primary broom, so as to insure the proper sweeping of every portion of the street traversed by the brooms. The said auxiliary broom is also driven by the motor D and preferably from the shaft end opposite that from which the primary broom is driven.

A hood O is secured to the front of the yoke-frame E' and overhangs the front of the outer portion of the broom, and a hinged wing O' is provided, Fig. III, from which a canvas dust-regulator apron is depended in front of that portion of the inner part of the broom projecting laterally from the car. Similar provision is made for regulating the dust thrown by the auxiliary broom.

Upon the top of the yoke-frame E' is secured a row of incandescent lamps P, which are connected with suitable electric connections in the car by means of a flexible conductor p, secured to the supporting-rod h, as shown in Fig. II. These lamps serve to warn occupants of the street of the approach of the device at night-time.

In the modified form of device illustrated in Fig. IX the use of the segmental rack is dispensed with for effecting the angular movement of the main broom, and for it I substitute a gear Q, to which is secured an arm q, whose extremity is connected with a link-arm q', journaled at a suitable point to the said broom. The pinion L meshes with said gear, whereby, it is seen, the operation of the hand-wheel will effect, as before, the angular movement of the broom.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any one of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention—

1. In a street-sweeping device, the combination of a vehicle, a broom pivotally and rotatively mounted thereon, means for imparting angular, means for imparting rotative movement to, and means for raising and lowering the ends of the broom independently.

2. In a street-sweeping device, the combination of a vehicle, a broom pivotally and rotatively mounted thereon, means for imparting angular, means for imparting rotative movement to and means for raising and lowering the broom's ends simultaneously or independently of each other.

3. In a street-sweeping device, the combination of a vehicle, a broom pivotally and rotatively mounted and supported at both ends thereon, means for imparting angular, means for imparting rotative movement to and means for positively raising and lowering said broom, such means for imparting angular and rotative movement being adapted to operate simultaneously.

4. In a street-sweeping device, the combination of a vehicle, a rotary broom having one

end of its shaft mounted upon said vehicle in a manner such as to render such shaft simultaneously rotatable, angularly movable, and capable of being raised and lowered, a gear-segment secured to said shaft, a pinion mounted upon said vehicle meshing with said segment whereby such angular movement may be effected, and levers supported upon said vehicle and connected with the ends respectively of said shaft whereby the raising and lowering of the latter may be effected.

5. In a street-sweeping device, the combination of a vehicle, a broom pivotally mounted upon the latter, an upright hollow mast secured to same, and a flexible connection secured to the outer broom end supported on the top of, passing through the inside and secured below the top of said mast.

6. In a street-sweeping device, the combination of a vehicle, a broom pivotally mounted upon the latter, an upright mast secured thereto and provided at its top with a sheave mounted upon a rotatable support, a flexible connection supporting at one end the outer broom end, passing over said sheave, a lever suitably mounted on said vehicle, the other end of said connection secured to said lever, and means for securing the latter.

7. In a street-sweeping device, the combination of a vehicle, a driving-shaft mounted thereon, a broom-spindle having its inner end secured to said shaft by means of a universal joint, the outer shaft end being suspended by means secured to the vehicle, and means connected with said shaft for raising and lowering same, whereby the inner broom end may be raised and lowered.

8. In a street-sweeping device, the combination of a vehicle, a rock-shaft secured to the bottom of the latter; arms secured to said shaft, a driving-shaft journaled in said arms, a broom having one end secured to said shaft by means of a universal joint, means for rotating said driving-shaft, and means for oscillating said rock-shaft.

9. In a street-sweeping device, the combination of a vehicle, a rock-shaft secured to the bottom of the latter; arms secured to said shaft, a driving-shaft journaled in said arms, a broom having one end secured to said shaft by means of a universal joint, means for rotating said driving-shaft, and means for oscillating said rock-shaft, guide-rods secured to said vehicle-bottom, and guide-bearings mounted upon said driving-shaft for engaging said rods.

Signed by me this 29th day of June, 1901.

IRA A. MCCORMACK.

Attest:

A. F. INGERSOLL,
M. B. EXCELL.