

(No Model.)

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C. GURNEY.
STREET SWEEPER.

No. 507,361.

Patented Oct. 24, 1893.

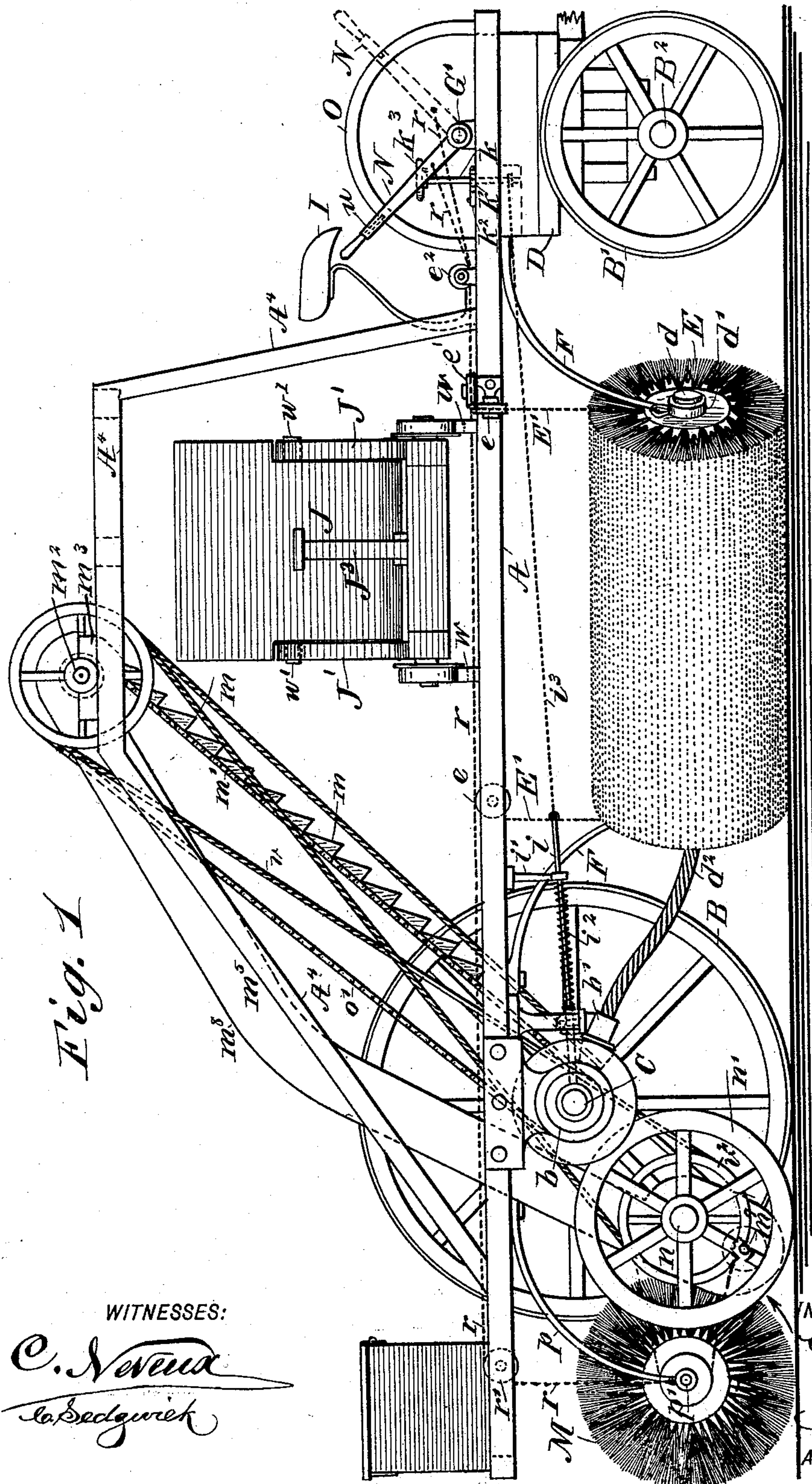


Fig. 1

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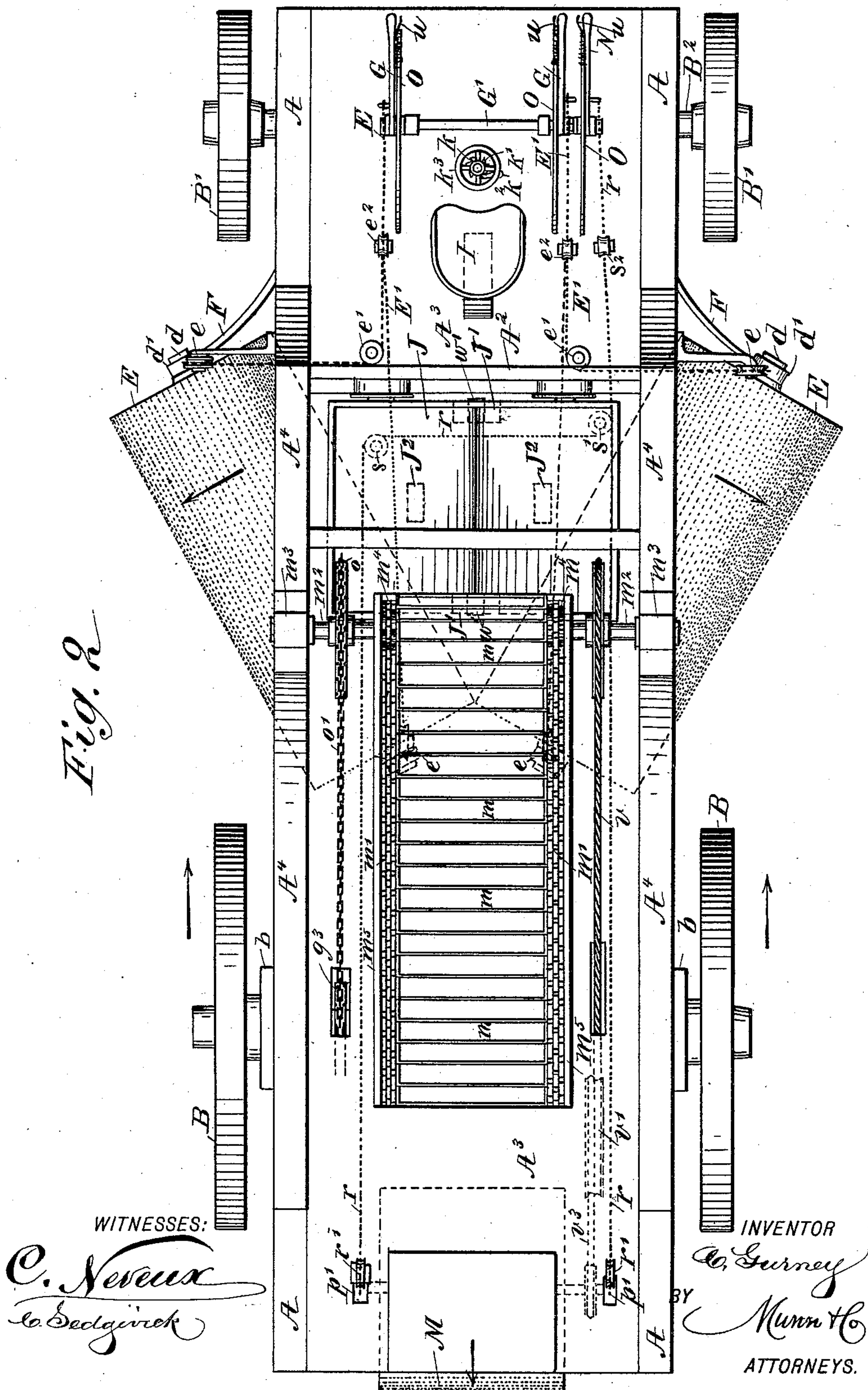
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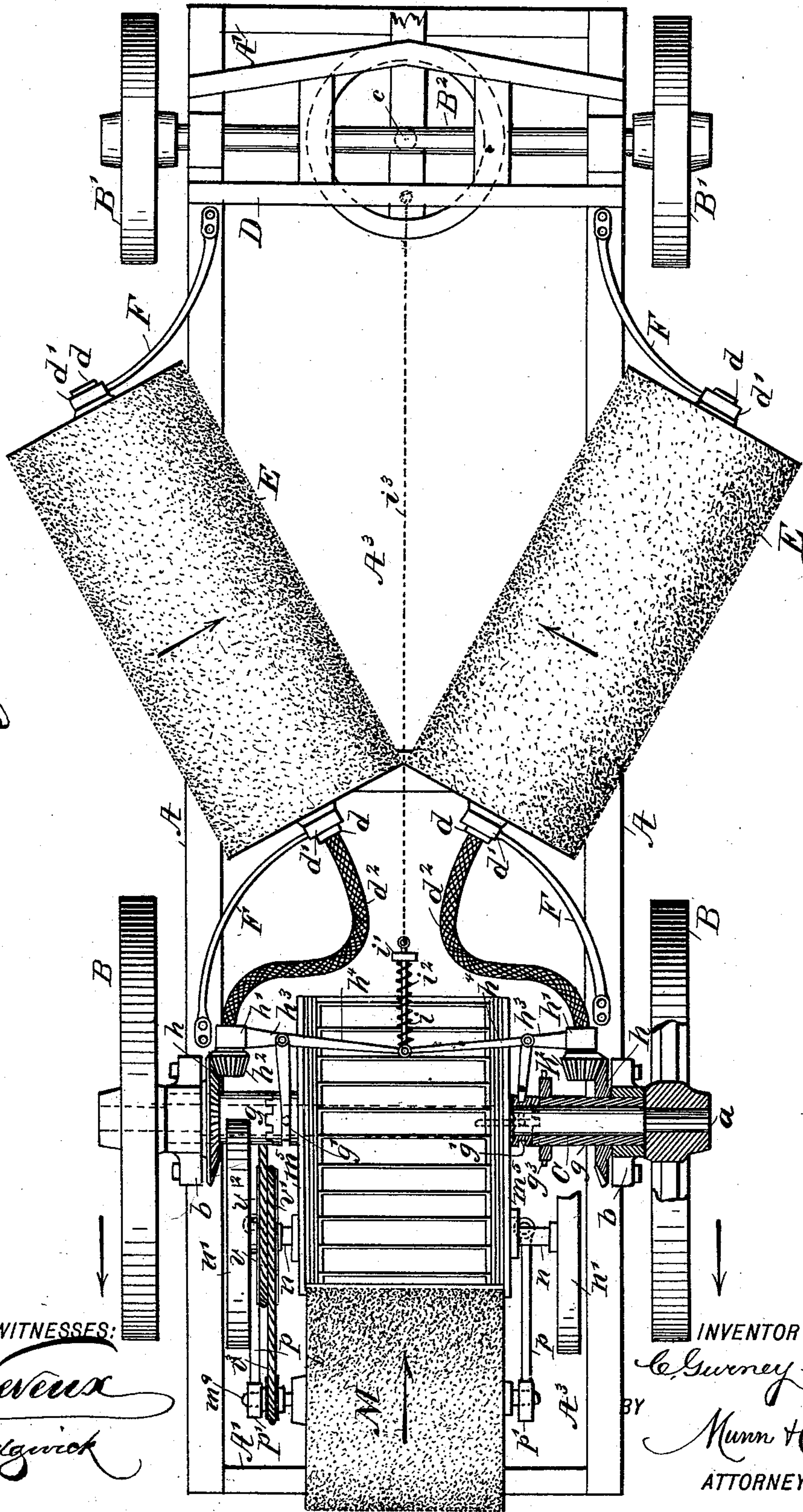
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Fig. 3



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Fig. 5

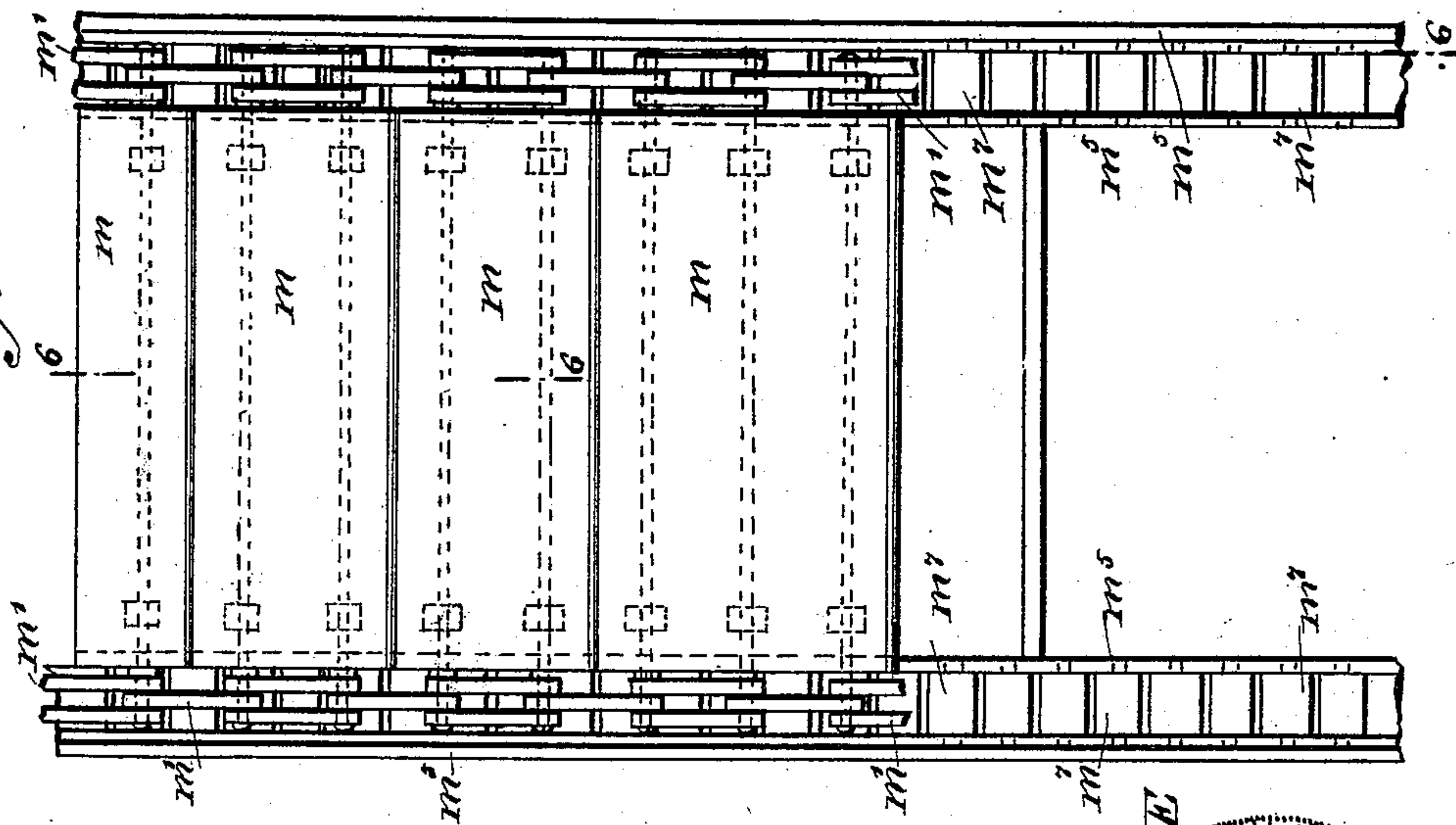


Fig. 4

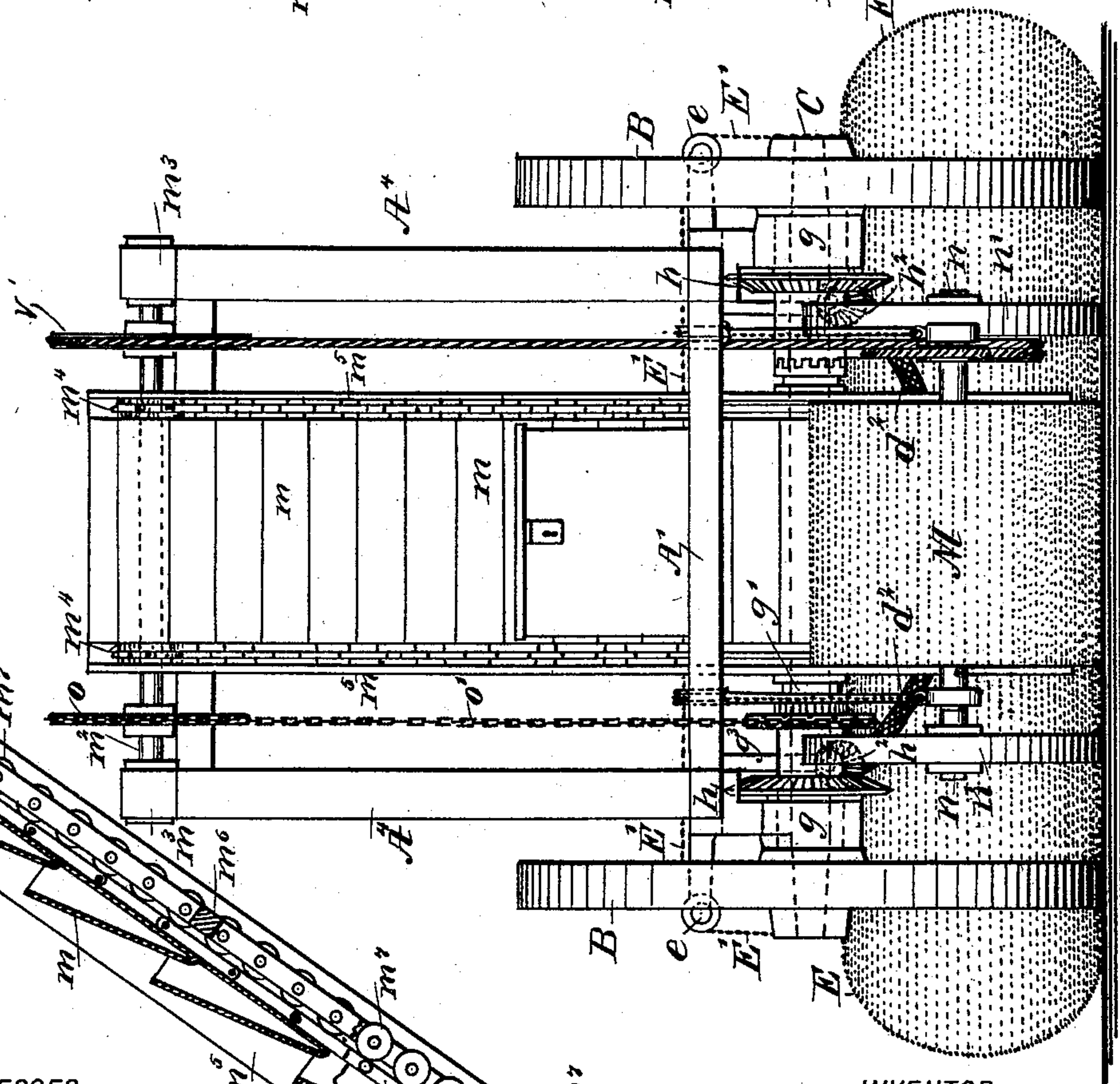
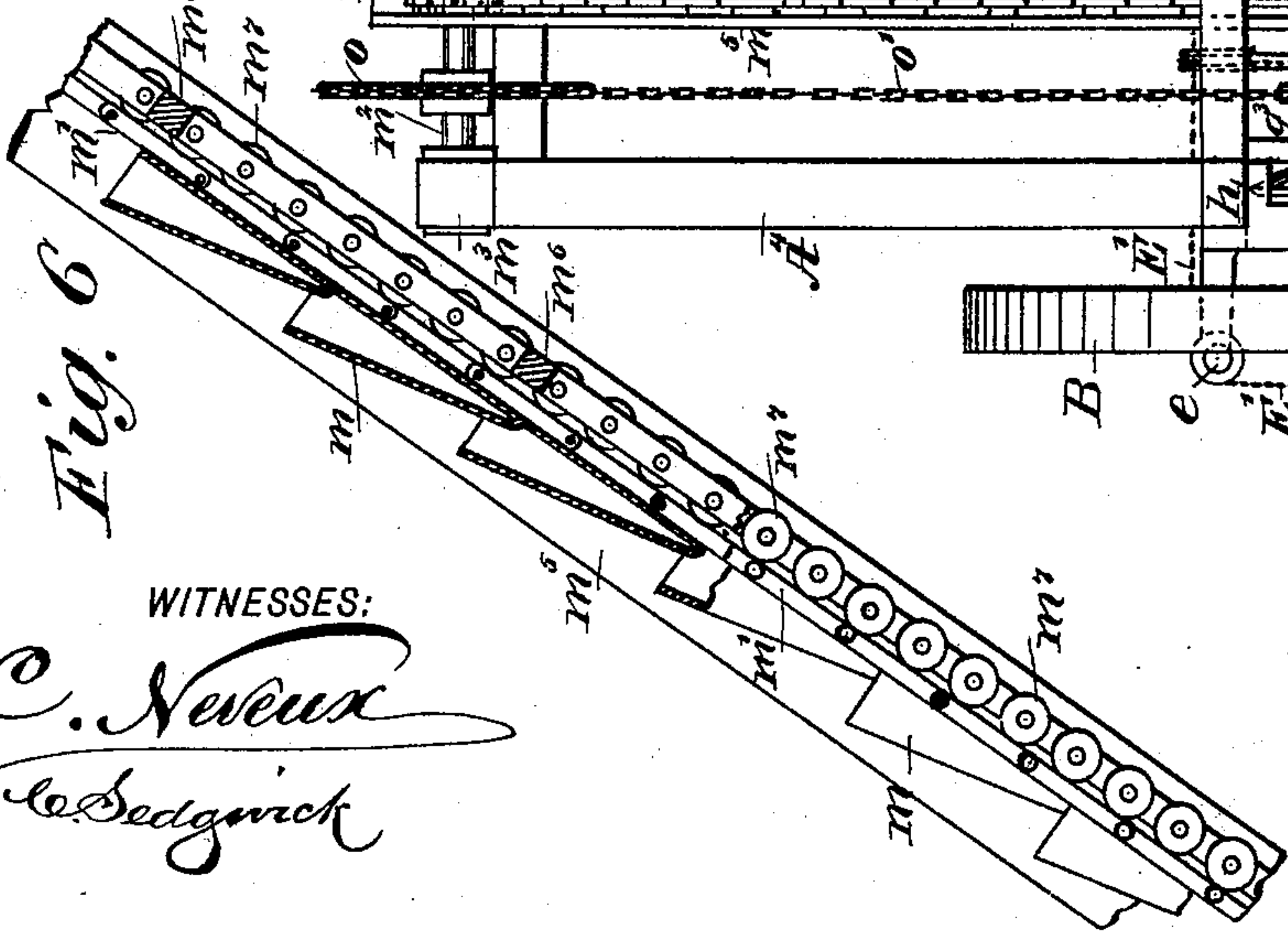


Fig. 6



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UNITED STATES PATENT OFFICE.

CHARLES GURNEY, OF BROOKLYN, NEW YORK.

STREET-SWEEPER.

SPECIFICATION forming part of Letters Patent No. 507,361, dated October 24, 1893.

Application filed January 11, 1893. Serial No. 458,053. (No model.)

To all whom it may concern:

Be it known that I, CHARLES GURNEY, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Road-Sweepers, of which the following is a full, clear, and exact description.

My invention relates to improvements in a class of sweeping devices employed to remove dirt of all kinds from a road bed, and deposit it in a receptacle; and has for its objects, to provide a novel and superior machine of the type indicated, which will be adjustable in its working parts, be convenient to control, and that will be reliable and effective in service.

To these ends, my invention consists in the construction and combination of parts, as is hereinafter described and claimed.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side view of the improved sweeper. Fig. 2 is a plan view. Fig. 3 is a reverse plan view. Fig. 4 is a rear view of the machine. Fig. 5 is an enlarged rear view in part, of the endless elevator forming a portion of the machine; and Fig. 6 is a transverse section in part, of the elevator, on the line 6—6 in Fig. 5.

There is a frame provided for the support of other parts of the machine, composed of two similar side beams A, of wood or metal, having a proper length, and held suitably spaced apart by the transverse frame pieces A', that are secured to the ends of the beams A, as indicated in Fig. 3.

The sweeper frame is mounted on four wheels B, B', that are in pairs respectively located near the rear and front of the structure, the rear wheels B, being firmly secured upon the ends of an axle C, as at a, in Fig. 3, which axle is adapted to rotate in the bracket boxes b, which are oppositely secured so as to depend from the side beams A, at a proper distance from their rear ends. The front wheels B', are rotatably secured upon the front axle B², which is held by any proper means transversely on the swiveling frame D, that is adapted to swing on the main frame by the pivot bolt c.

Between the front and rear wheels B', B, two cylindrical brushes E, are located, these similar brushes having a suitable diameter for effective service, and such a proportionate length, as will adapt them to occupy an angular position below the frame side beams A, from which they are hung.

As shown in Figs. 1 and 3, the center shafts d, of the brushes E, project beyond the brush splints at each end, sufficiently to provide journals, which latter engage boxes d', secured upon the lower ends of the spring arms F, the upper ends of said arms being secured upon the beams A; and such a relative curvature is given to the arms, as will adapt the front ends of the brushes to lie a proper distance outside of the wheels B', and their rear ends within the parallel planes of the beams A.

The length of the arms F, is so proportioned as to permit the brushes E, to lie horizontally when said arms are in a normal condition, and also to enforce a contact of said brushes with the surface of the roadbed they are to sweep.

The rear ends of the brushes E, are projected toward each other, and nearly have contact, any suitable angle of divergence from a median line of the sweeper frame A, A', being given thereto.

The arms F, are sufficiently elastic, to permit them to be flexed, and thus raise the brushes from the roadbed when this is desired, and to facilitate such an adjustment of the latter, chains or wire ropes E' are provided. The lifting chains E', are duplicated for each brush E, and one end of each chain member is secured to one of the boxes d', on the lower end of the spring hanger arms F.

As shown in Figs. 1 and 2, the chains E', extend upwardly from the brush ends, passing over the grooved pulleys e, that are bracketed and affixed by their bracket frames upon the side beams A, at the front ends of the brushes, and upon a flooring or transverse timber of the sweeper frame, at their rear ends. From the pulleys e, the two chains for each brush extend forwardly, and the chain for the front end of each brush passes inwardly to engage a bracketed pulley e', which pulleys are fastened upon the cross timber A², or flooring A³ of the sweeper frame; the positions given the pulleys e', adapting the front

member of each pair of lifting chains E' , to lie close to its fellow member, so that each of said chains may pass together forwardly, and be connected to one chain that passes over a loose pulley e^2 , and thence to be attached by its front end to the upright lever G .

The similar levers G , are secured at their lower ends upon a transverse rock-shaft G' , which is journaled in boxes seated upon and secured to the flooring A^3 , imposed upon and affixed to the sweeper frame A, A' , said shaft being placed near the front edge of the floor or platform whereon it is located.

The body of the rear axle C , is formed truly cylindrical from the inner ends of the hubs of the wheels B , toward the longitudinal center of said axle, and on each of these cylindric portions, a sleeve g , is loosely mounted. The sleeves g , are loosely fitted at their outer ends in the boxes b , so as to provide rotatable journals for the axle they are located upon, and on said sleeves adjacent to the inner faces of the boxes b , bevel gear wheels h , are secured.

From the inner ends of the shafts d , flexible shafts d^2 , are extended toward the bevel gear wheels h , which shafts d^2 , are journaled in boxes h' , near their ends that are adjacent to the bevel wheels, said boxes being secured to the frame beams A , so that the pinions h^2 which are affixed upon the shaft ends that project beyond the boxes h' , will have a meshed engagement with the gear wheels h , and be adapted to transmit rotary motion from the sleeves g , to the brushes E , when the sleeves are revolved.

On the axle C , near the inner ends of the sleeves g , two similar clutch heads g' , are located, and held to slide longitudinally of the axle by a feather or key connection for each head, as indicated by dotted lines at the right side of Fig. 3. These clutch heads, of ordinary form, are designed to interlock with mating clutch formations on the inner ends of the sleeves g , and when so connected adapt the brushes E to revolve toward each other when the sweeping machine is moved forwardly.

Upon each box h' , an arm h^3 , is inwardly projected of a sufficient length to form supports for the similar bell-crank levers h^4 , said levers having a pivoted connection with the inner ends of the arms, so that one limb of each bell crank may project toward one of the clutch heads g' , and loosely engage a peripheral groove in the same, as shown in Fig. 3. The other limbs of the bell cranks h^4 , are elongated sufficiently to allow their free ends to lap together, and also have a lapped contact with the pull-bar i , which parts are all pivoted together with one bolt, and the bar which extends centrally of the sweeper frame A, A' , toward the front of the machine, works at its front end in a box i' , secured upon the lower side of the floor or platform A^3 . On the pull bar i , and between the box i' , and joint on the ends of the bell crank arms, a spiral spring i^2 , is mounted which spring is made to press

upon these arms and hold the clutch heads g' , in engagement with the clutch heads on the sleeves g .

The front end of the pull bar i , is attached to a chain or like flexible connection i^3 , which extends forwardly and has its front end affixed to the body of a vertical shaft k , rotatably sustained on the platform A^3 , and having a ratchet wheel k' , secured upon it near said platform, so that a pawl k^2 pivoted on the platform may be swung and caused to interlock with the teeth on the ratchet wheel; a hand wheel k^3 , affixed on the upper end of the shaft k , affording means to rotate it and wrap a portion of the chain i^3 thereon. The ratchet wheel, and pawl when the latter is interlocked therewith serve to retain the chain i^3 in a wrapped condition, and thus rock the bell crank levers h^4 far enough to withdraw the clutch heads g' , from the sleeves g and arrest the rotation of the brushes E . The shaft k , is by preference located near the transverse center of the platform A^3 , directly in front of a seat I , provided for the driver of the team of draft animals that are connected to the front of the sweeping machine to move it.

Upon each of the side beams A , a housing frame A^4 , is erected, each housing consisting of a front timber and a rear timber, inclined toward each other, and connected at their upper ends by a horizontal timber as indicated in Figs. 1 and 2, thus affording vertical and parallel frame supports that are connected at the top by transverse beams secured by their ends to the horizontal top pieces of the housing frames.

The frame structure A^4, A^4 , is provided to sustain the upper portion of an elevator device at a proper height and in a correct position, so as to adapt the elevator to discharge material it raises, into a car J , on the platform A^3 , below the upper end of the elevator as will be further described. The elevator, as preferably constructed, consists of a series of transverse buckets m , having a like form, and secured at proper intervals of separation, by their ends, upon two similar endless sprocket chains m' . These chains are of a sufficient length, considered in their doubled condition, to adapt them to extend from the top of the housing frame structure to a point near the ground, and properly inclined by their supports, which latter consist essentially of a transverse counter-shaft m^2 , journaled at its ends in the boxes m^3 , secured oppositely on the horizontal members of each housing frame A^4 . Said shaft has two similar sprocket wheels m^4 , secured on it at proper points to receive the bights of the sprocket chains m' , that are imposed thereon as represented in Fig. 4. The buckets m , are sufficient in number to occupy the entire chains m' , and are so arranged that their open top sides will travel toward the wheels m^4 , on the side of the elevator nearest to the rear end of the machine. There are two

guide ways m^5 , provided to support the portion of the elevator chains that travels upwardly, and as indicated in Figs. 5 and 6 these similar parts each consist of a trough 5 having two sides held spaced apart and parallel by the transverse bars m^6 , that are sufficient in number to render the troughs stable. Between the sides of each guide-way m^5 , a series of rollers m^7 , is introduced, and 10 adapted to freely rotate by a journaled engagement of their ends with suitable perforations formed in said sides oppositely in pairs.

The length of the elevator buckets m , is so 15 proportioned as to allow their ends to lightly rest upon the inner sides of the guide-ways m^5 , while the chains m' to which they are attached by projections from their ends, rest upon the rollers m^7 , so that the weight of the 20 loaded elevator will be mainly sustained by the rollers m^7 , the inner sides of the guide-ways serving to direct the bucket and prevent any rocking of the same at their ends.

By preference, the guide-ways m^5 , are bent 25 or arched near their centers of length as at m^8 in Fig. 1, which is done for the purpose of giving a steep grade to the portion of the elevator below the point m^8 .

The bights of the sprocket chains m' , at 30 their lower ends, engage the peripheries of sprocket wheels having the same form and dimensions as the upper sprocket wheels m^4 , said lower wheels being secured at proper points on the transverse shaft m^9 , one end of 35 which is shown in Fig. 1, where other parts are broken away to expose it, and also in Fig. 3.

At a correct distance from the lower ends of the guide-ways m^5 , the similar trunnion 40 shafts n are oppositely secured to their outer sides as shown in Fig. 3, these shafts having a journaled engagement with the traveler wheels n' , which are of a like diameter, that is, sufficient to adapt them to support the 45 lower part of the elevator, and cause it to maintain a uniform distance from the ground traversed by the machine.

The conveyer buckets, and the chains they are secured upon, receive motion from the 50 sprocket wheel g^3 , secured upon one of the sleeves g at a proper point for its alignment, vertically considered, with a larger sprocket wheel o , secured on the counter-shaft m^2 ; an endless sprocket chain o' that engages the 55 peripheries of these wheels, thus affording means to transmit rotary motion from the sleeve g to the counter-shaft and elevator buckets when the brushes E are rotating, the elevator buckets being simultaneously arrested 60 when the brushes cease to revolve.

There is a transverse brush M located at the rear of the sweeper frame A , A' , having its periphery close to the lower portion of the elevator, said brush being elastically supported by the spring arms p , that curve rearwardly and downwardly from their upper 65 ends, that are secured upon the side beams

A , of the sweeper frame, as shown in Figs. 1 and 3. From the boxes p' on the lower end of the arms p which afford support for journal ends of the center shaft of the brush M , 70 chains or ropes r , project upwardly, having one end of each secured to the boxes. The chains r , pass over the bracketed pulleys r' , which are attached free to rotate, on the platform A^3 , and thence extend forwardly, one of 75 said chains engaging a loose pulley s , and thence extending transversely to pass around the loose pulley s' , joining with the other chain forwardly of the pulley last named, and 80 from it extending as a single chain or rope over a pulley s^2 , and forwardly to be attached by its end to an upright lever N , secured at its lower end upon the rock shaft G' , before mentioned. 85

There is an arch plate O , provided for each lever G , G' , N , and erected from the platform A^3 , at one side of each lever, which latter are so situated as to be within the reach of a 90 driver seated on the seat I , so that when these levers are rocked forwardly, and a spring bolt u , on each is made to enter a notch in the arch plate it is above, the forward draft of the chains connected to the levers named, will 95 elevate the brushes E , E' , and M , a proper distance from the ground, so as to permit the machine to be transported to and from the place where it is to be used as a sweeper, and avoid useless wear on the brushes.

The rear brush M is adapted for a proper 100 rotatable movement toward the elevator buckets, or in the direction of the curved arrow in Fig. 1, by a crossed belt v , placed on the grooved pulley v' , mounted upon and secured to the transverse counter-shaft m^2 , and 105 also upon a pulley v^2 , that is loosely secured upon an inward extension of the hub of one of the wheels n' , the pulley v^2 being double grooved, as indicated in Fig. 3, at the left 110 side, so as to receive another belt v^3 , having its rearward double portion or bight placed upon a smaller grooved pulley rigidly secured upon the shaft m^9 of the brush M .

There is a dumping car J , provided, which is constructed as shown in Figs. 1 and 2, the 115 body having trunnions w' , oppositely projected on its sides near the center, which trunnions loosely engage boxes on the upper ends of the standards J' , that are oppositely erected on the sides of the car frame at its longitudinal 120 center. The car body is maintained in a normally level condition by the removable prop posts J^2 , or similar means. The car complete, is located on the transverse car tracks W , that are secured on the platform A^3 , at a 125 proper point to adapt said car to receive the dirt from the elevator.

It will be seen that the forward movement of the improved sweeping machine over a 130 road bed that is to be swept, will, if its brushes are in contact therewith and adjusted to revolve, first sweep the dirt from the street gutter toward the center of the road bed, and then sweep the windrow thus produced, upon the

elevator buckets which will discharge it into the car J, at its open top, and when full, said car will be transported with the sweeper to a point where the car is to be removed there-
 5 from by rolling it off the side upon another track or upon the ground, to be subsequently unloaded or dumped, and then returned to its place on the sweeper for a resumption of operations until the work is completed.

10 The peculiar construction of parts controlling the brushes and elevator renders the improved sweeper very convenient in service, as all the working parts can be adjusted with ease, by the driver on the seat I.

15 Having thus fully described my invention, I claim, as new and desire to secure by Letters Patent—

1. The combination with the wheeled frame, and a rotary vertically movable brush, of an
 20 inclined elevator supported at its upper end to freely rise and fall, and having its upper shaft driven from the axle of the driving wheel, and ground wheels on the lower end of the elevator frame, whereby the lower end
 25 of the elevator will always remain in proper relation to the brush when passing over inequalities in the surface being swept, a double pulley v^2 loose on the axis of one ground wheel and belted to said brush and to the up-
 30 per elevator shaft, substantially as set forth.

2. The combination with the wheeled frame having downwardly curved or inclined springs p , and the transverse brush journaled in bearings in the lower ends of said springs and
 35 pressed downwardly thereby, and means for adjusting the brush, of the elevator into which the brush sweeps, the said elevator being piv-

oted to freely rise and fall and provided on its lower end with ground wheels $n' n'$, whereby it will be kept in proper relation to the brush, 40 substantially as set forth.

3. The combination with the wheeled frame having side frames or standards A^4 on its upper side, and a spring pressed brush M on its under side, of the transverse elevator shaft 45 m^2 journaled on the upper sides of the frames or standards A^4 and rotated from the drive wheels, the endless elevator, the frame m^5 of which at its upper end is mounted loosely on said shaft m^2 to permit the frame to freely 50 rise and fall, said frame being curved or bowed between its ends as at m^8 , and the ground wheels supporting the lower end of the elevator frame and permitting it to freely rise and fall, substantially as set forth. 55

4. A sweeping machine, comprising the wheeled frame, A, the spring arms F, the inclined forward brushes E E journaled in the lower ends of said arms and having flexible shafting connecting the inner ends of their 60 shafts with the rear drive wheels, a clutch mechanism, a rear transverse brush M, spring arms p , the adjusting mechanisms at the forward end of the frame for said brushes and clutches, the inclined elevator extending up- 65 wardly and forwardly from the rear brush, and a laterally removable car on the frame into which the elevator discharges, substantially as set forth.

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Witnesses:

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