

A. S. JANIN.

TROLLEY.

APPLICATION FILED DEC. 30, 1907.

917,445.

Patented Apr. 6, 1909.

3 SHEETS—SHEET 1.

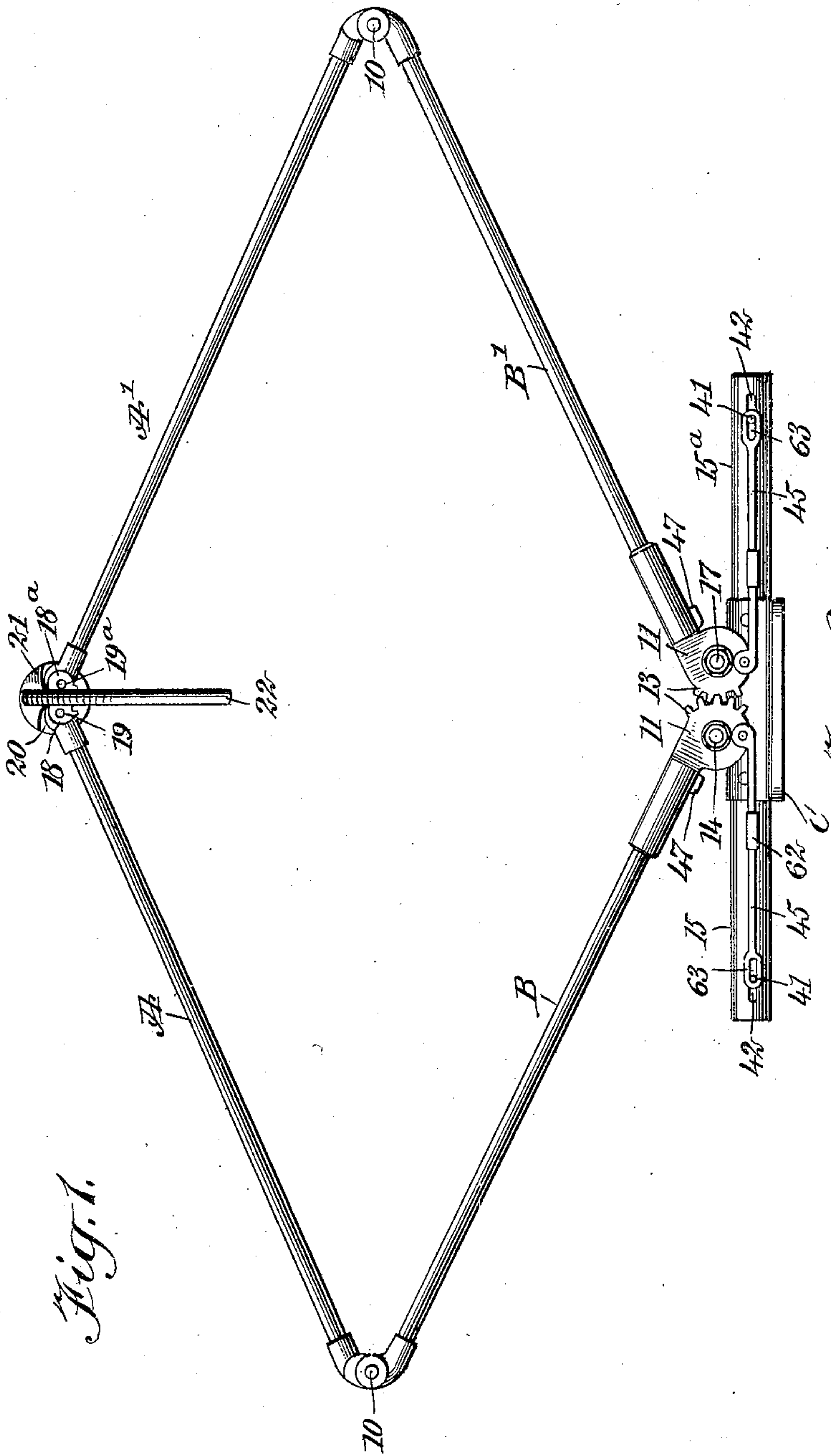


Fig. 1.

WITNESSES

*George Maylor*  
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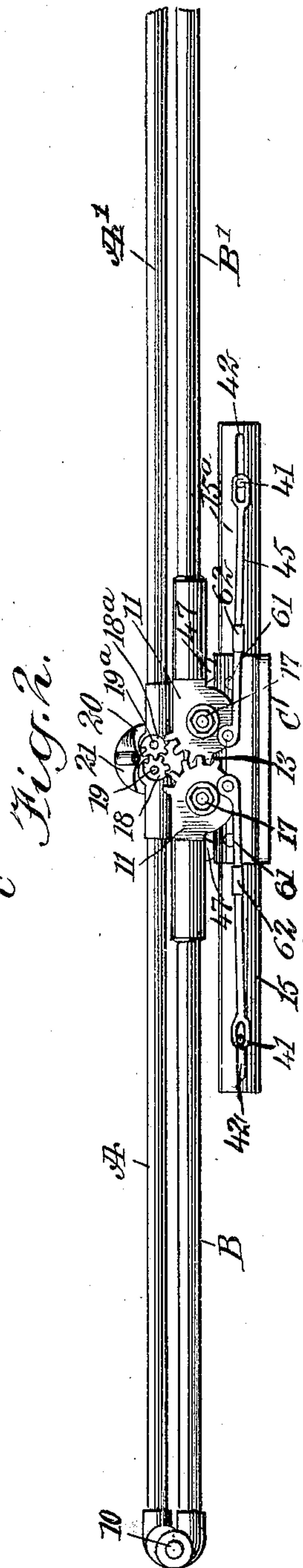


Fig. 2.

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Fig. 3.

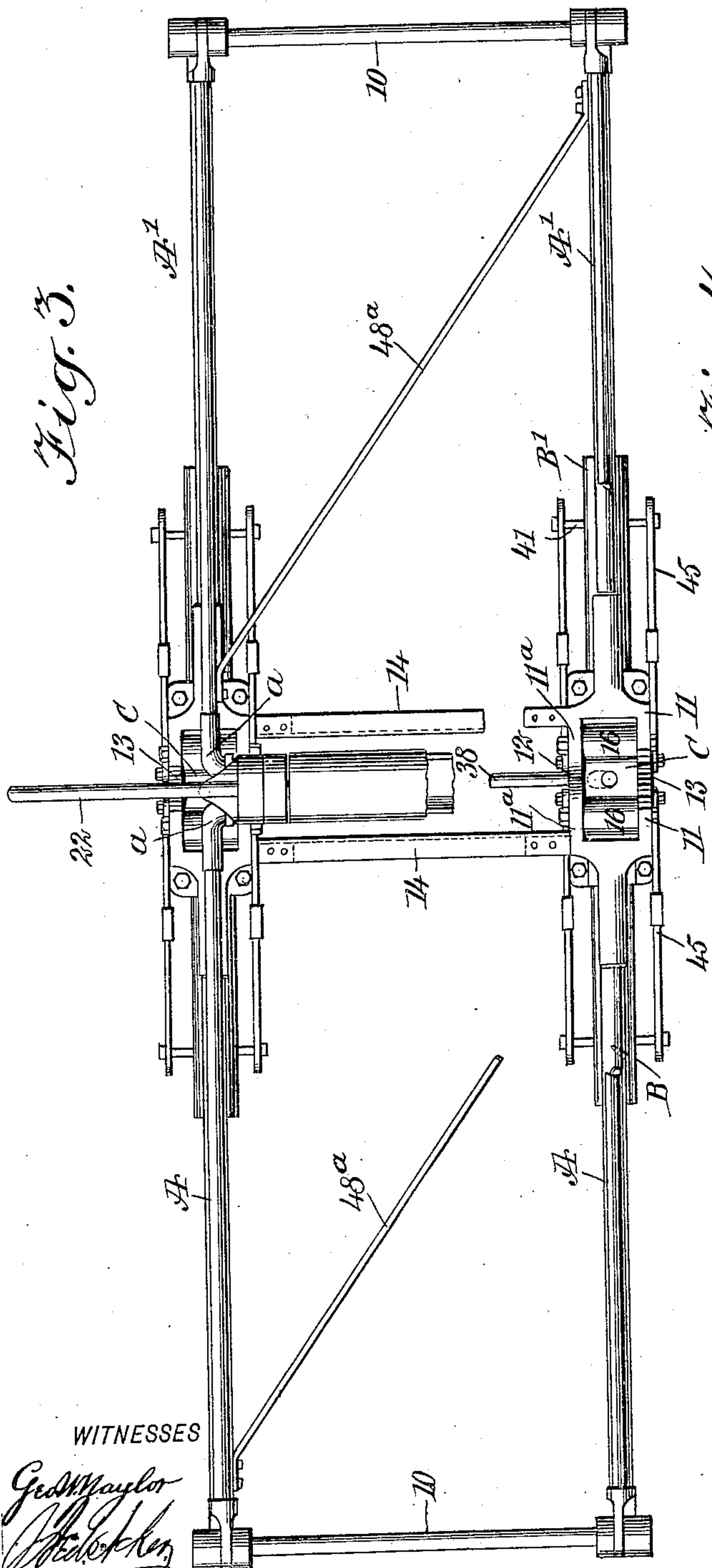
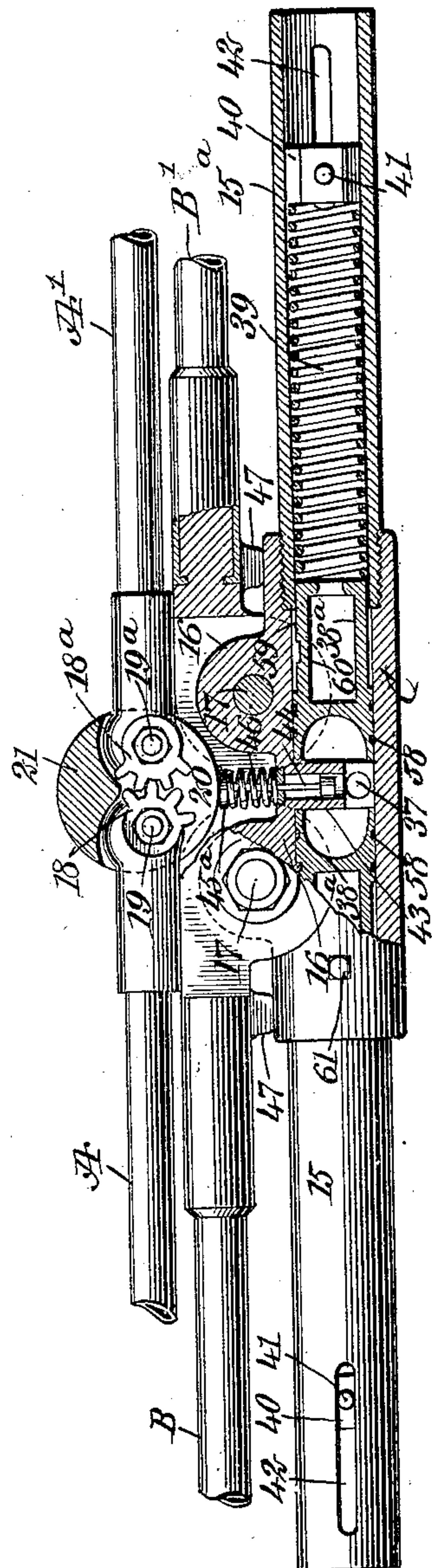


Fig. 4.



WITNESSES

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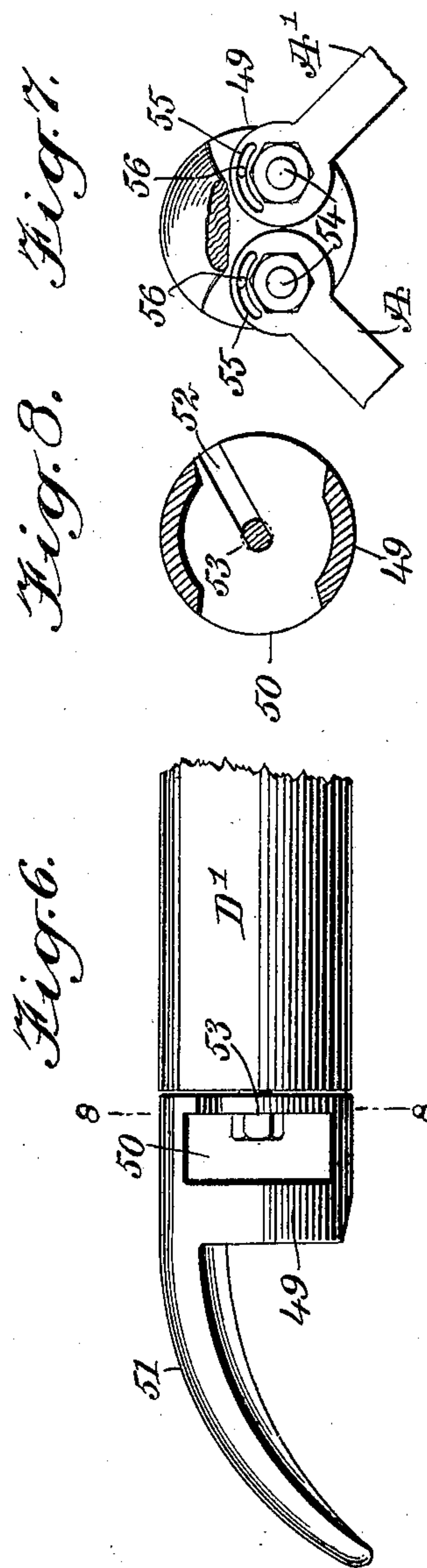
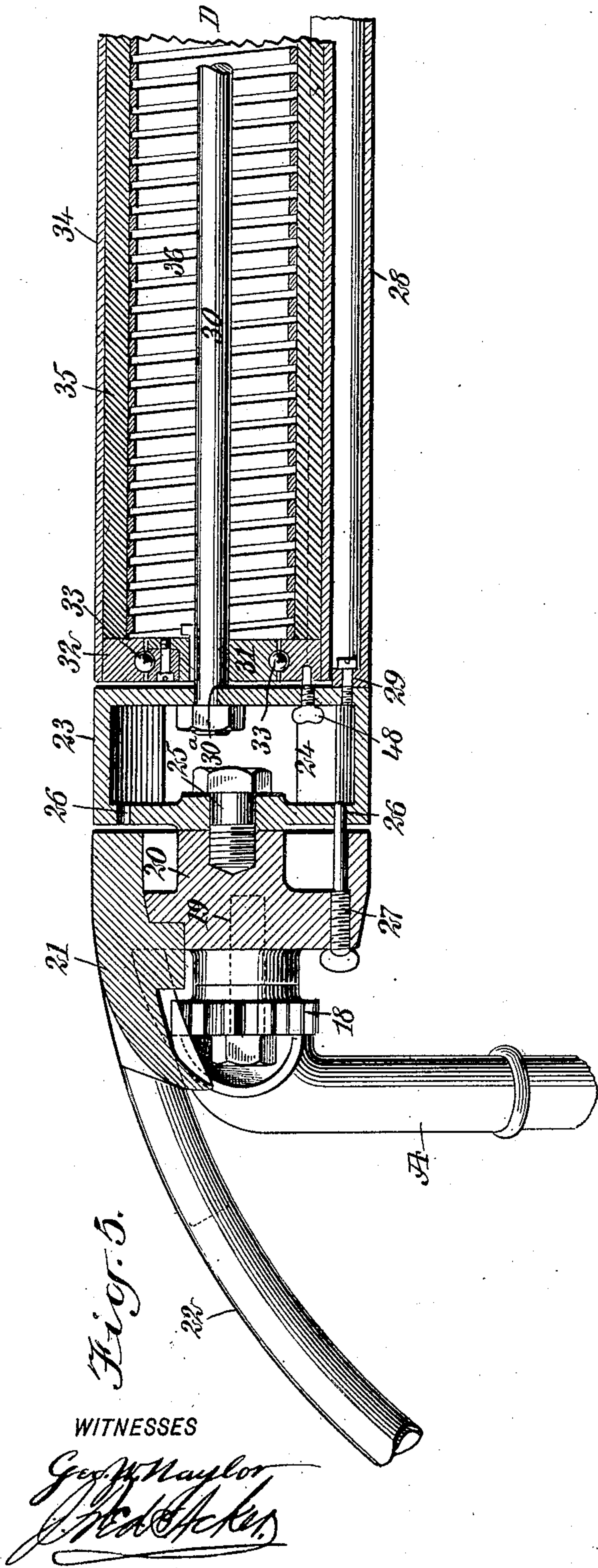
TROLLEY.

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# UNITED STATES PATENT OFFICE.

ALBERT S. JANIN, OF NEW YORK, N. Y., ASSIGNOR OF ONE-THIRD TO AMELIA JANIN, OF BROOKLYN, NEW YORK.

## TROLLEY.

No. 917,445.

Specification of Letters Patent.

Patented April 6, 1909.

Application filed December 30, 1907. Serial No. 408,618.

*To all whom it may concern:*

Be it known that I, ALBERT S. JANIN, a citizen of the United States, and a resident of the city of New York, Rosebank, borough of Richmond, in the county of Richmond and State of New York, have invented a new and useful Improvement in Trolleys, of which the following is a full, clear, and exact description.

The purpose of the invention is to provide a trolley with a collapsible diamond-shaped frame, spring and pneumatically operated, so designed that it will reliably operate at all times, especially when used in high speed work and in connection with heavy traffic; and it is also a purpose of the invention to so construct the trolley that it will be completely under the control of the motorman, and so that it will not leave the wire without being purposely withdrawn therefrom.

Another purpose of the invention is to provide a simple and durable trolley, which while light in structure will withstand the severe lateral strain consequent on the running of the car at high speed on a straight track, and on curves.

Another purpose of the invention is to so construct the trolley that in passing over railway crossings it will invariably reach the wire, and further, when a train carrying the trolley is run in tunnels and subways, it will successfully work in very low head-room.

It is likewise a purpose of the invention to provide a trolley that does not need reversing, since it operates as successfully in one direction as in the other, and which when taking the current from the third rail may be collapsed to lie close to the roof of the car or locomotive, at the will of the person in charge.

It is a further purpose of the invention to provide a trolley that will be noiseless in operation, and wherein the contact roller is designed to give it long life, the roller being accompanied by a scraper adapted to remove ice from the wire, and wherein also the roller can be locked and made to act as a scraper or slide.

A further purpose of my invention is to have the trolley raised and held in operative position by pneumatic pressure and provide means also to lock it in said position and work from that position when the air is exhausted.

Another purpose of my invention, which is very vital, is to have means when the trolley

is not in operative position to relieve the springs of their tension and let them expand to their normal position, whereas in other trolleys when they are lowered and kept in position for a length of time the springs become compressed and lose a great deal of their tension.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter set forth and pointed out in the claims.

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

Figure 1 is a side elevation of the improved trolley expanded to its full position; Fig. 2 is a similar view but illustrates the trolley fully collapsed; Fig. 3 is a plan view of the trolley; Fig. 4 is an enlarged side elevation of the central portion of the trolley, parts being in section; Fig. 5 is an enlarged longitudinal section through a portion of the contact roller; Fig. 6 is a side elevation of one end of the contact roller, illustrating a modified form of the bearing therefor; Fig. 7 is a sectional end view of the contact roller shown in Fig. 6; and Fig. 8 is a section taken practically on the line 8—8 of Fig. 6.

The frame of the trolley consists of two upper bars A and A' at each side, and two corresponding lower bars B and B'. These bars are connected at their outer end portions by suitable connecting rods 10, the connection being so made that when the trolley is in place the entire frame can be dropped to the lower flat position shown in Fig. 2, or can be elevated to the position shown in Fig. 1. The inner ends of the lower members B and B' of the frame are mounted to turn upon a tubular base C, which is in the nature of a cylinder and is adapted to be secured to the top of the car or locomotive or other vehicle to which the trolley is to be applied. The inner ends of the lower bars B and B' are bifurcated, as is shown in Fig. 3, providing thereby an outer member 11 and an inner member 11<sup>a</sup>, the two members at each bifurcated portion of the lower bar being parallel, as is also shown in Fig. 3, and the outer edges of the said members 11 and 11<sup>a</sup> are rounded off or are rendered segmental, as is illustrated at 12 in Fig. 3, but the inner ends of the outer members 11 at the



bifurcated end of the said lower bars B and B' are provided with teeth 13, and the said toothed portions are segmental, corresponding to the curvature of the opposing portions 12 above mentioned. Transversely opposing segmental sections of the frame are connected by transverse bars 14, likewise shown in Fig. 3, and these connecting bars insure that the sides of the frame shall have uniform movement.

Each base C is provided with a tubular extensions, and these extensions are designated as 15 and 15<sup>a</sup>; as illustrated in Fig. 4 the sections or extensions 15 and 15<sup>a</sup> are shown as being screwed to the base C to which they belong, but it will be understood that they can be otherwise attached, or that they may constitute an integral portion of said base. Each base C is provided at each side of the center at its upper surface, with a lug or bearing, the lugs or bearings being designated as 16, and the members 11 and 11<sup>a</sup> of the lower bar sections B and B', of the frame, are pivoted to these lugs by means of suitable pivot pins 17, as is shown in Figs. 3 and 4. The inner ends of the upper bar sections A and A' of the frame terminate in toothed segments 18 and 18<sup>a</sup>, and these toothed segments 18 and 18<sup>a</sup> are pivotally connected with cheek pieces 20 by means of suitable pivot pins 19 and 19<sup>a</sup>. The teeth of the segments 18 and 18<sup>a</sup> are adapted to mesh as likewise the teeth of the lower segments 11, as is shown in Fig. 2.

A guard lip 21 is made to extend outward and downward from the cheek pieces 20, a sufficient distance to form a shield or a protective medium for the upper segments 18 and 18<sup>a</sup>. In addition to the aforesaid guard lips 21, guide arms 22 are likewise made to extend downward and outward from the cheek pieces, the guide arms being integral with the aforesaid guard lips, as is shown in Fig. 5. These arms 22 are adapted as directors for the wire. A bearing 23 is located at the inner side of each cheek piece 20, as is illustrated in Fig. 5, and these bearings are circular and are hollow and are provided with openings in one of their sides, the openings being designated as 24, and these bearings 23 are pivoted to the said cheek pieces by means of suitable pivot pins 25, as is also shown in Fig. 5. Each bearing 23 is provided at its outer face with opposing openings 26 located preferably near the periphery of said bearings, and either one of the openings 26 is adapted to receive the inner end of a pin 27, that is preferably screwed into a cheek piece 20, as is also shown in Fig. 5, so as to hold the bearings 23 in adjusted position.

A scraper 28 is made to connect the bearings 23, the scraper being segmental in cross section, and the convexed face of the scraper 28 is flush with the outer or peripheral face of

the bearing 23, and the scraper 28 is attached to the said bearings 23 by means of suitable bolts 29, or the equivalents thereof. A shaft 30 is made to extend from the central portion of one bearing 23 to the central portion of the opposing bearing, said shaft having transverse shoulders 30<sup>a</sup> near the ends to stop end movement, the bearings turning loosely on said shaft, and the said shaft 30 carries a contact roller D and the heads of the said contact roller are in two sections, an inner section 31 and an outer section 32, the inner section 31 of the heads being secured by keys or otherwise to the shaft 30, and the outer sections 32 of the heads of the said roller are free to turn upon the fixed inner sections 31 on ball bearings 33. Preferably the roller D is constructed as shown in Fig. 5, consisting of an outer metal tube 34 that is carried over the heads of the roller and is secured to the outer sections 32 of said heads, and an inner tube 35 of rubber, together with a spiral spring 36 that has bearing against the rubber tube 35 and serves to force the said rubber tube against the outer metallic tube.

Each cylindrical base C is provided at its central portion with an opening 37, and each of said openings 37 receives a pipe 38 that connects the bases together and leads to any source of compressed air, under the control of the motorman or other person attending to the direction of the vehicle. Opposing plungers 38<sup>a</sup> are located in each cylindrical base C, being one at each side of the opening 37, and these plungers are acted upon by the compressed air that enters the said cylindrical base C, and a spring 39 is located in each extension 15 and 15<sup>a</sup> of each cylinder or base C, the inner ends of the said springs having bearing against the outer ends of the plungers 38<sup>a</sup>, and the outer ends of the springs 39 have bearing against cylindrical blocks 40, that slide in the said extensions 15 and 15<sup>a</sup>, and a pin 41 is passed through each of these blocks 40, and said pins 41 extend out beyond the opposite sides of the extensions 15 and 15<sup>a</sup> from the base, through longitudinal slots 42 produced in said extensions, as is best shown in Fig. 4. A piston rod 45 is attached to each outer end of each of said pins 41, and these piston rods at their inner ends are pivotally and eccentrically connected with the toothed sections 11 forming a portion of the lower frame bars B and B', so that when air under compression is admitted to the bases C, the plungers or pistons 38<sup>a</sup> are forced outward, placing the springs 39 under compression, and likewise carrying the pins 41 in an outward direction, whereupon the piston rods 45 are likewise carried outward, thus causing the frame members to be separated and carried upward to the position shown in Fig. 1. When the supply of air is cut off, the frame mem-



bers return to their lower position, the upper members lying flat upon the lower members, as is shown in Fig. 2, and both the upper and lower members at such time are substantially parallel with the top of the car or other vehicle, as is illustrated also in Fig. 4.

In order to assist the frame in rising, and likewise to provide a cushion for the upper members of the frame when the said frame is in its lower or collapsed position, a tubular pocket 43 is formed at the central portion of each base C, being open at top and bottom, and the said pockets extend out through the top portions of said bases, and in each of the said pockets 43 a plunger 44 is located, having a lower and an upper head, the upper head being the larger one and is designated as 45<sup>a</sup>. This upper head is held some distance above the top of the base C carrying it, by means of a suitable spring 46, and when air is forced into the base C it forces the plunger 44 upward and since when the frame is lowered the cheek pieces rest upon the larger head 45 of said plungers, as the plungers rise they assist the upper members of the frame in rising, and when the frame is collapsed the cheek pieces will come in engagement with the upper heads 45<sup>a</sup> of the said plungers, when the upper members of the frame have reached their lowest position, and thus the plungers under these circumstances will act as cushions for the upper portions of the frame, as is illustrated in Fig. 4.

When the frame is in its lower position, the lower members thereof are supported by lugs 47, carried thereby adjacent their inner ends, which lugs rest upon the upper faces of the bases C, said lugs keeping the frame in horizontal position. The contact roller D may be locked stationary so as to act as a scraper when desired, and this is accomplished by means of a pin 48, one of which is located in the inner wall of each bearing 23, and the said pins when employed are made to enter the outer or movable sections 32 of the heads of the said roller. The object in making the bearings 23 rotatable and in providing means for locking the said bearings in adjusted position, is to carry the scraper 28 either to a point below or a point above the said contact roller.

In Fig. 6 I have illustrated a slight modification in the construction of the upper portion of the frame, wherein the bearings 23 are omitted and likewise the scraper, and the cheek pieces 49 are provided with openings 50 extending through them, and while the guide arm 22 is omitted, the cheek pieces 49 are provided with guard lips 51 as in the other form of construction. The cheek pieces 49 at their inner ends are provided with diagonal slots 52 that receive the trunnions 53 of the contact roller D', as is shown in Fig. 8.

In Fig. 7 I have illustrated a slightly different way of connecting the upper or inner ends of the upper frame members A and A' to the cheek pieces 49. The said attachment is accomplished by pivoting the upper ends of the said upper frame members to said cheek pieces by means of simple pins 54, the gears or teeth being omitted from this portion of the said bars and instead segmental slots 55 are produced in the said inner ends of the said upper frame members A and A', and bearings 56 secured to the cheek pieces 49 are made to extend outward through said slots.

The inner ends of the upper frame members are inwardly curved where they connect with the cheek pieces, as is shown at *a* in Fig. 3. It will be observed that the bifurcated parts 11 and 11<sup>a</sup> of the lower frame members constitute toggles. When the contact roller is locked it acts as a sliding bearing, and it may be here remarked that the pistons or plungers 38<sup>a</sup> are provided with packing rings 58 fitted in grooves in their peripheries at their inner ends, to allow said packing rings to have full compression, the outer end portions of the said pistons or plungers being of lesser diameter, as is shown also in Fig. 4.

The plungers or pistons 38<sup>a</sup> are provided with annular exterior grooves 59, and a recess 60 is formed in the base wall of each recess, as is shown in Fig. 4, which recesses are adapted to receive pins 61, that extend through the base, when the pneumatics is not used. At such time, the springs 39 are employed to hold the trolley frame in its upper position, being placed under tension and held so by forcing the plungers or pistons outward and causing the pins 61 to enter the recesses 60.

The piston rods 45 are made in two sections connected by a coupling 62, so that they can be adjusted to compensate for wear; and where the piston rods 45 receive the pins 41, slots 63 are made to admit of play of the plungers after the collapsing of the frame.

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

1. In trolleys for locomotives and trains, a collapsible diamond-shaped frame, spring and pneumatically controlled, and an auxiliary lifting device for the frame, said lifting device serving as a cushion for the frame when lowered.

2. In a trolley for locomotives and trains, a collapsible diamond shaped frame, means for expanding the frame, and a pneumatic cushion for the frame when collapsed, said cushion also serving to exert a lifting action on the frame.

3. In trolleys for locomotives and trains, a collapsible diamond-shaped frame, spring and pneumatically controlled, said frame



consisting of upper and lower pivotally supported members, means for expanding the frame through said controlling pneumatics, the frame collapsing through gravity as the  
 5 pneumatic influence is withdrawn, and a cushion for the upper members of the frame when collapsed, which cushion is caused to exert a lifting influence upon the upper frame members when the said controlling  
 10 pneumatics is applied.

4. In trolleys for locomotives and trains, two pairs of oppositely arranged cylinders, upper and lower sets of frame members pivoted together, the lower frame members having  
 15 bifurcated and segmental toothed inner ends, each pivoted to a cylinder, rigid connections between the inner ends of the sets of lower members, a roller carried by the upper frame members, pistons in the cylinders,  
 20 sliding members in the pistons, springs interposed between the sliding members and pistons, and a connection between each sliding member and the inner end of each lower frame member, the connection being  
 25 loosely connected with the sliding member and eccentrically pivoted to the frame member.

5. In trolleys for locomotives and trains, two pairs of oppositely arranged cylinders,  
 30 upper and lower frame members pivoted together, the inner ends of the lower members being bifurcated and pivoted to a cylinder each member of the bifurcation being segmental and toothed, rigid connections between  
 35 the inner ends of the sets of lower members, a roller carried by the upper frame members, pistons in the cylinders, sliding members in the cylinders, springs interposed between the sliding members and pistons,  
 40 and a pair of rods loosely connected to each sliding member and eccentrically pivoted to the bifurcated segmental inner end of a lower frame member.

6. In a trolley of the character described,  
 45 two pairs of oppositely arranged cylinders having longitudinally slotted outer ends, upper and lower frame members pivoted together, the inner ends of the lower members being bifurcated and pivoted to a cylinder,  
 50 each member of the bifurcation being segmental and toothed, a rigid connection between the inner ends of the sets of lower members, a roller carried by the upper frame members, pistons in the cylinders, sliding  
 55 members in the cylinders and provided with pins projecting through the slots of the cylinders, springs interposed between the sliding members and pistons, and adjustable rods having their outer ends slotted to receive  
 60 the pins of the sliding members and their inner ends eccentrically pivoted to the segmental inner ends of the lower frame members.

7. A trolley of the character described,

comprising upper and lower sets of pivoted  
 frame members, the inner ends of the upper  
 frame members being inwardly curved,  
 gears on the inwardly curved ends of the  
 upper frame members, opposing members of  
 the lower frame members being segmental  
 70 and having meshing gears, braces connecting corresponding inner ends of the bottom frame members to give both sides of the frame a uniform movement, cheek pieces to  
 which the inner ends of the upper frame  
 75 members are pivoted, bearings carried by the cheek pieces, means for locking said bearings in adjusted position, a contact roller carried by said bearings, and means  
 for locking the said roller whereby it may act  
 80 as a sliding contact.

8. A trolley of the character described, comprising upper and lower sets of frame  
 members, a device to raise the frame in operative position, comprising a base and double  
 85 plungers or pistons adapted to receive pneumatic pressure, said plungers or pistons being separated from each other by a partition or wall in the center of the said base, said  
 pistons or plungers pushing out from the said  
 90 partition, the said plungers or pistons having slots in their peripheral surfaces at their inner ends, and packing rings in said slots, a piston placed in a vertical position between the  
 horizontally operated pistons or plungers,  
 95 being located in said partition and having an upward pushing action, likewise acting as a cushion, means for supplying compressed air to the base, extensions from the base, springs  
 fitted for movement in said extensions, being  
 100 placed under tension by the outward movement of horizontally operated pistons, carrier blocks on which the springs act, and means whereby the carrier blocks are connected  
 105 with the lower pivotal portions of the frame.

9. A trolley of the character described, comprising upper and lower sets of frame  
 members, a base, pistons or plungers adapted to receive pneumatic pressure, sundry of said  
 110 pistons or plungers moving outwardly and the others upwardly, means for supplying air to the said base, means for operating the frame, cooperating with the pistons and  
 plungers, which means are carried by the  
 115 base, a contact roller, a slide and scraper carried by the upper portion of the frame, the said contact roller having open bearings at each end, and a brace attached to said roller  
 and a second brace fitted and locked to the  
 120 support on which the said roller turns, the said braces being adapted to receive ball bearings between them, and means for locking the friction roller in operative position,  
 and means for controlling the position of the  
 125 scraper relatively to the contact roller.

10. A trolley of the character described, comprising a base, upper and lower sets of



frame members pivoted together and to the base, a roller carried by the upper frame members, a plurality of pneumatically operated plungers in the base, sundry of the plungers moving horizontally and the others vertically, and means between the horizontally moving plungers and the lower frame members for moving the frame members into operative position by the movement of the plungers.

11. A trolley of the character described, comprising a base, upper and lower sets of frame members pivoted together and to the base, a roller carried by the upper frame members, a plurality of pneumatically and spring actuated plungers, sundry of the plungers moving horizontally and the others vertically, sliding members operated by the springs of the horizontally moving plungers, and connections between the said members and the lower members of the frame.

12. A trolley of the character described, comprising a base, upper and lower sets of frame members pivoted together and to the base, a roller carried by the upper frame members, oppositely arranged cylinders carried by the base, the outer ends of the cylinders being slotted, plungers in the cylinders, sliding blocks in the cylinders and having pins projecting through the slots of the cylinders, springs in the cylinders between the plungers and blocks, rods loosely engaging the pins of the blocks and pivoted to the inner ends of the lower frame members, and means for admitting air to the cylinders to operate the plungers.

13. A trolley of the character described, comprising a base, upper and lower sets of frame members pivoted together and to the base, a roller carried by the upper frame members, oppositely arranged cylinders carried by the base, plungers in the cylinders, sliding members in the cylinders, springs between the plungers and members, connections between the sliding members and the lower frame members, intermediate cylinders in the base, plungers in the cylinders, and having heads on their plunger rods outside of the cylinders for engaging the frame, springs surrounding the plunger rods be-

tween the cylinders and heads, and means for admitting air to all of the said cylinders.

14. In a trolley of the character described, a collapsible diamond shaped frame, a roller mounted in the frame, means for expanding the frame, a cylinder, a plunger in the cylinder and having its plunger rod provided with a head adapted to engage the frame, a spring surrounding the plunger rod between its head and the cylinder, and means for admitting air to the cylinder.

15. In a trolley of the character described, a collapsible diamond shaped frame, a roller carried by the frame, pneumatically and spring actuated plungers for raising the frame, and means for locking the plungers stationary after the frame has been expanded to permit the frame to be held in its uppermost position by the springs.

16. In a trolley of the character described, a support, a collapsible diamond shaped frame carried by the support, oppositely arranged cylinders carried by said support, recessed plungers in the cylinders, movable members in the cylinders, springs between the said members and plungers, connections between the movable members and the lower frame members, and pins in the support and adapted to be engaged with the recesses of the plungers to lock the same.

17. In a trolley of the character described, a support, a collapsible diamond shaped frame formed of pairs of upper and lower members pivoted together, the lower members being pivoted to the frame and having bifurcated inner ends, said ends and the inner ends of the upper members being segmental and provided with teeth, cheek pieces to which the upper members are pivoted, adjustable bearings carried by the cheek pieces, a roller mounted in the bearings, and means for expanding the frame.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALBERT S. JANIN.

Witnesses:

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JOHN P. DAVIS.