

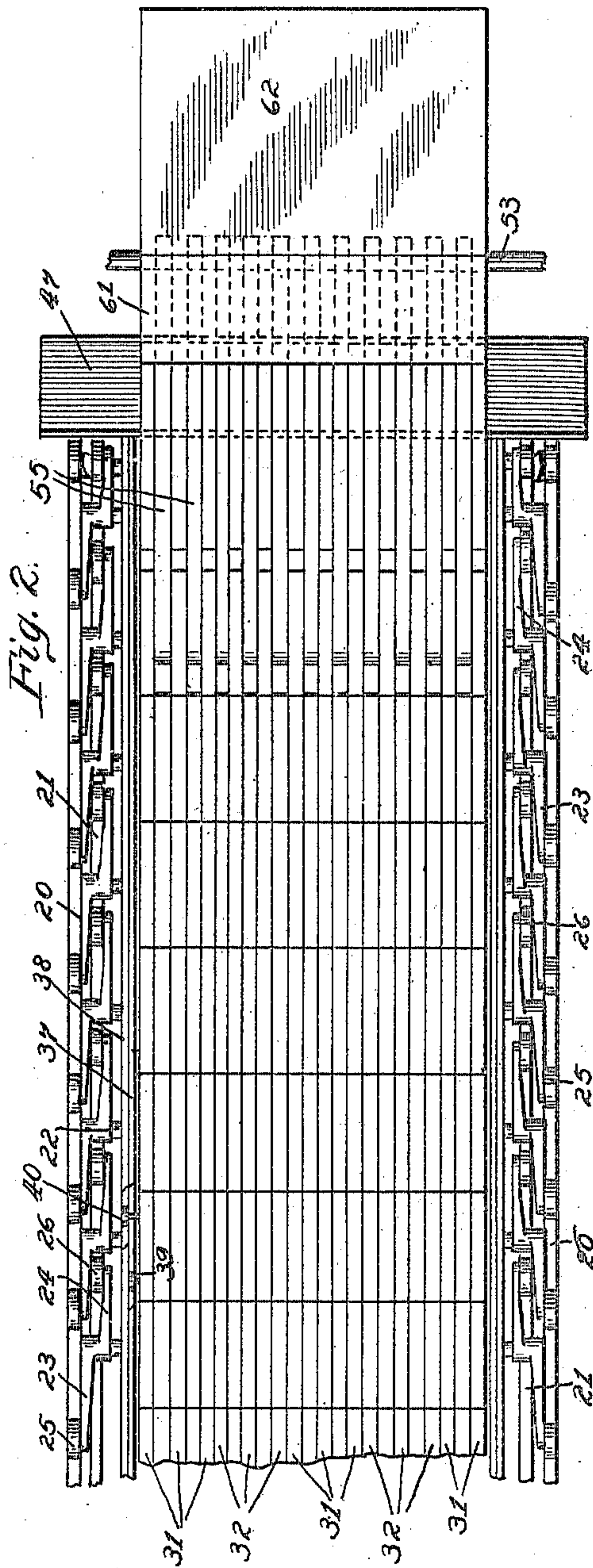
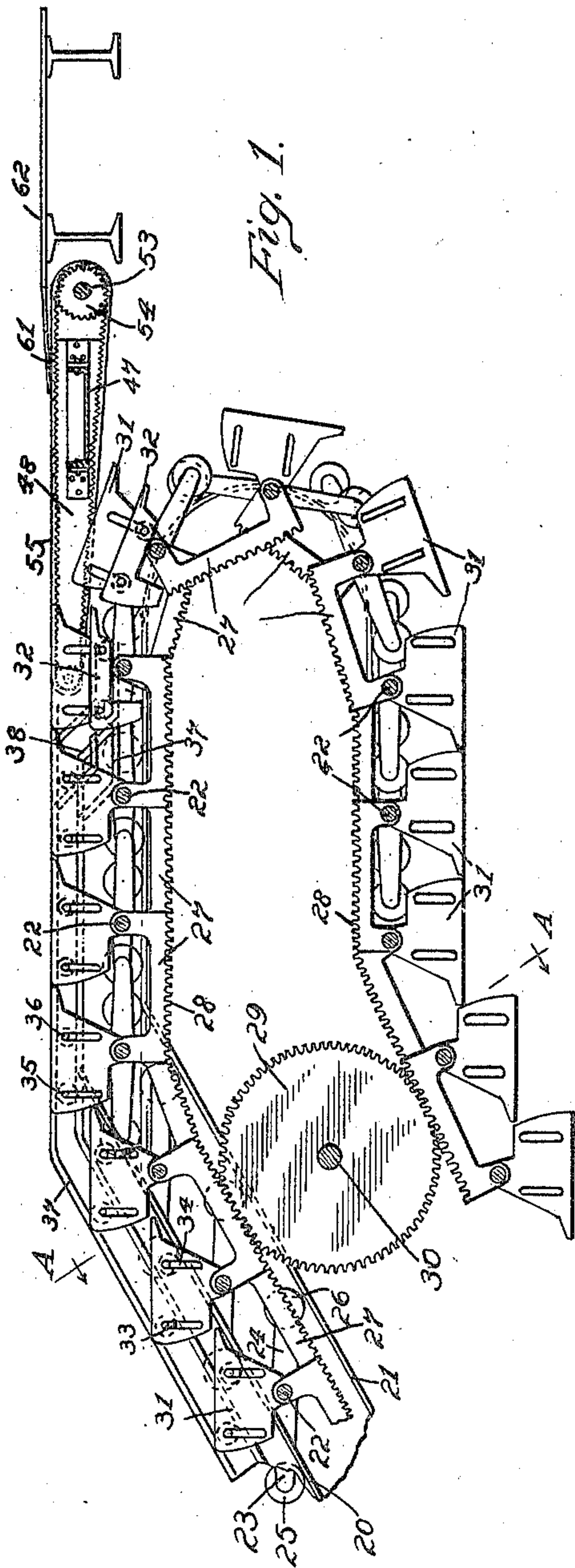
C. D. SEEBERGER.
ELEVATOR.

APPLICATION FILED JULY 10, 1902. RENEWED JUNE 14, 1909.

950,796.

Patented Mar. 1, 1910.

4 SHEETS—SHEET 1.



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4 SHEETS—SHEET 2.

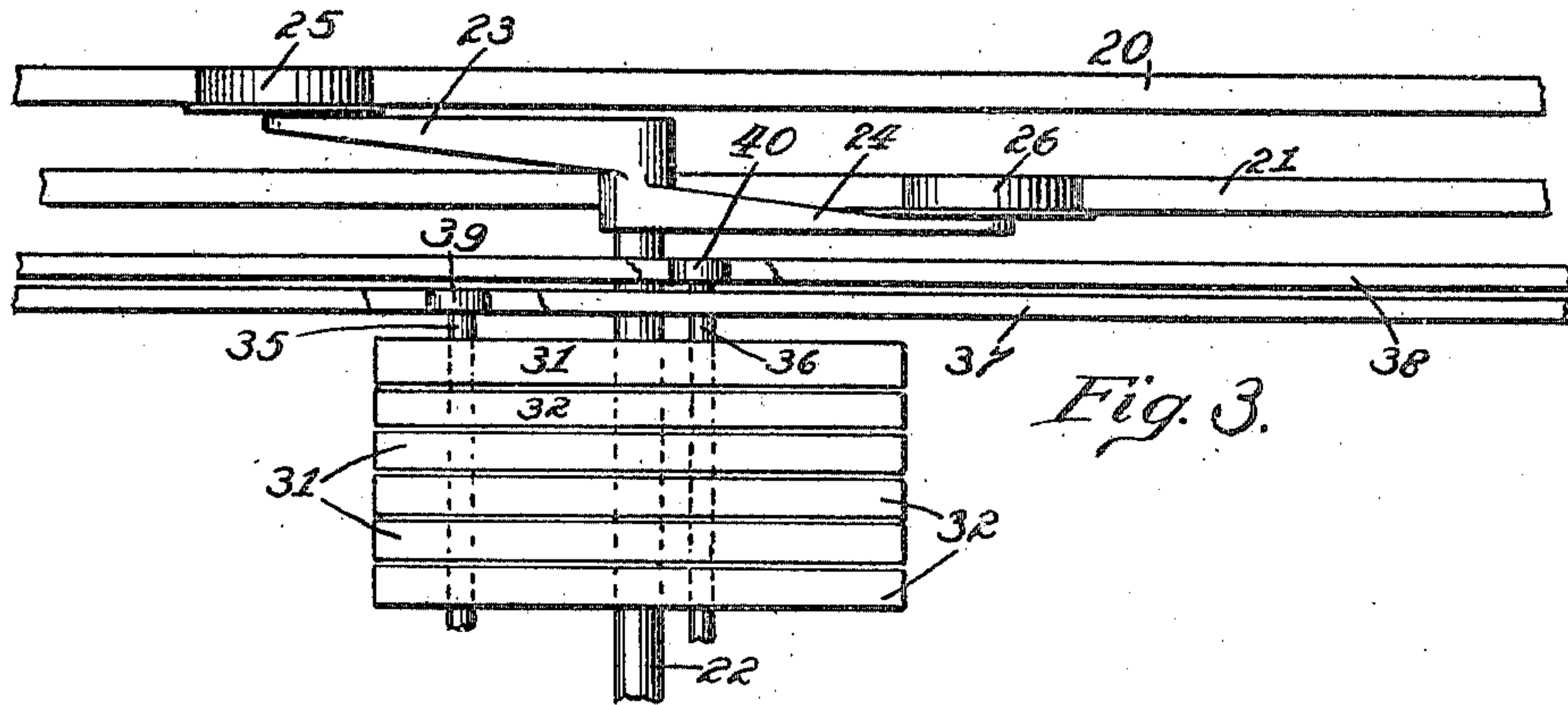


Fig. 3.

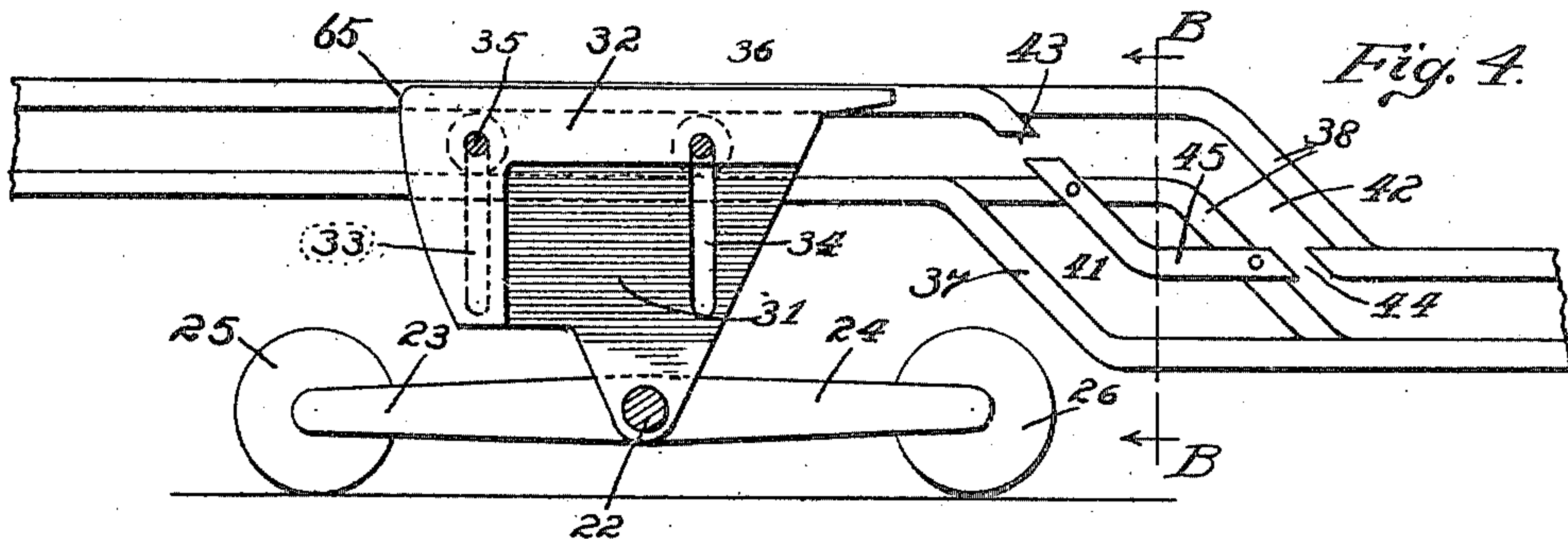


Fig. 4.

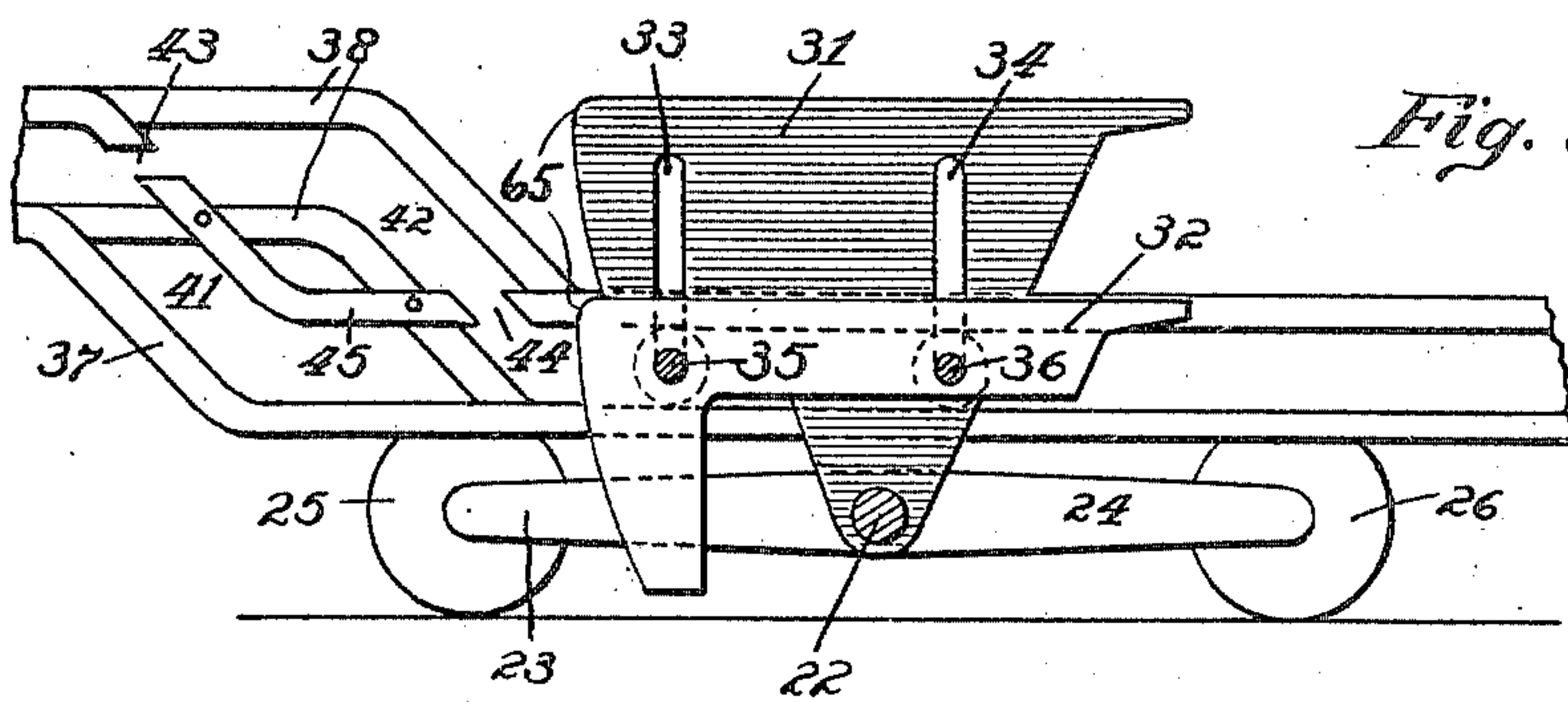


Fig. 5.

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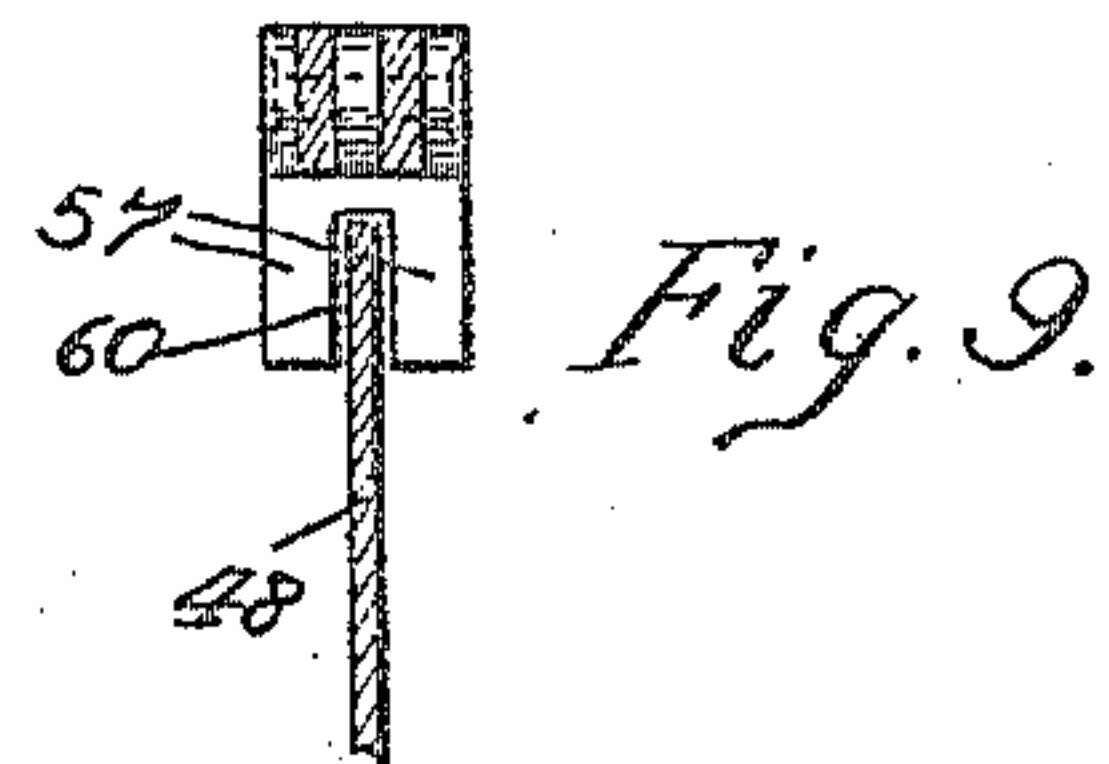
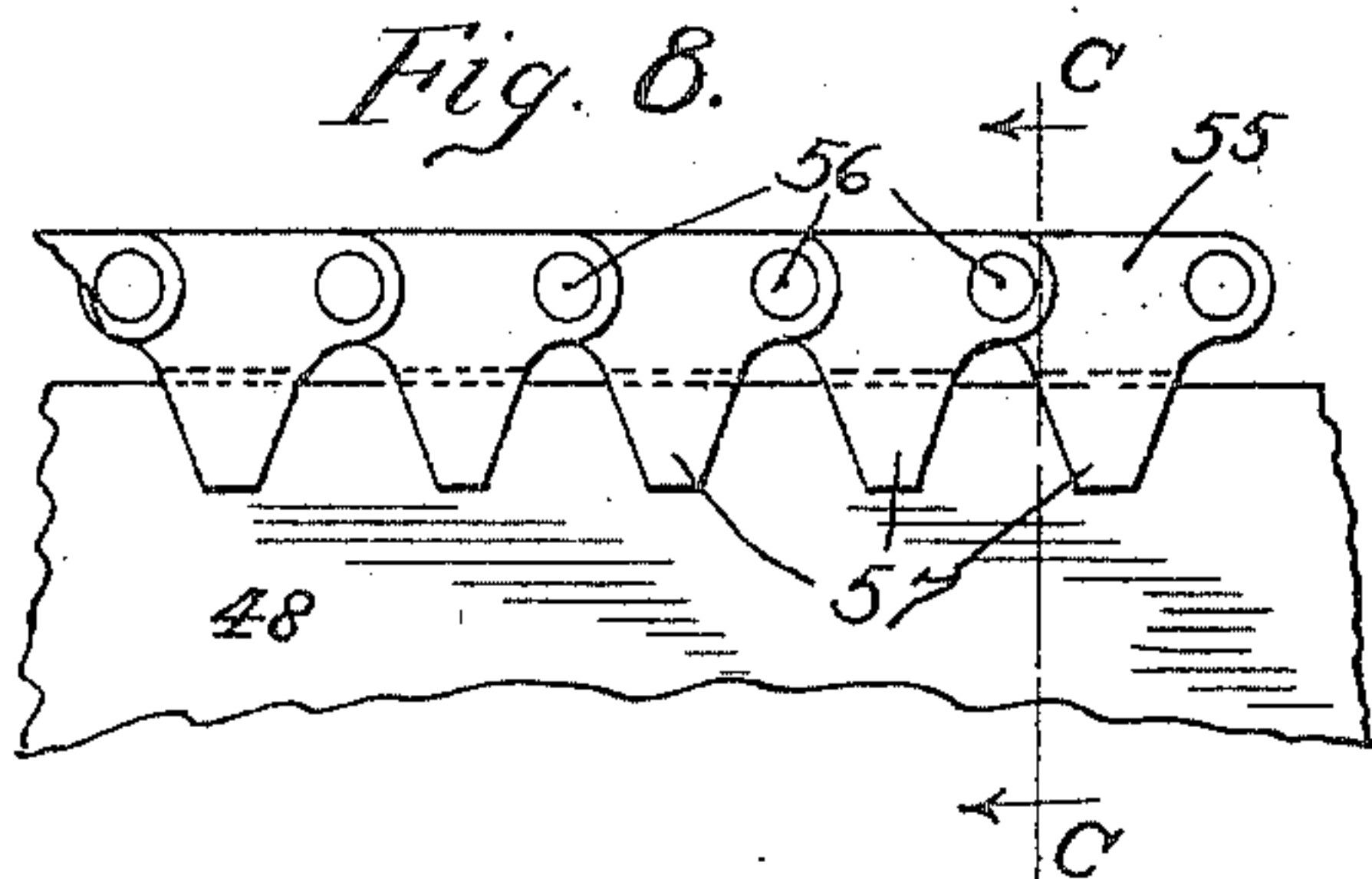
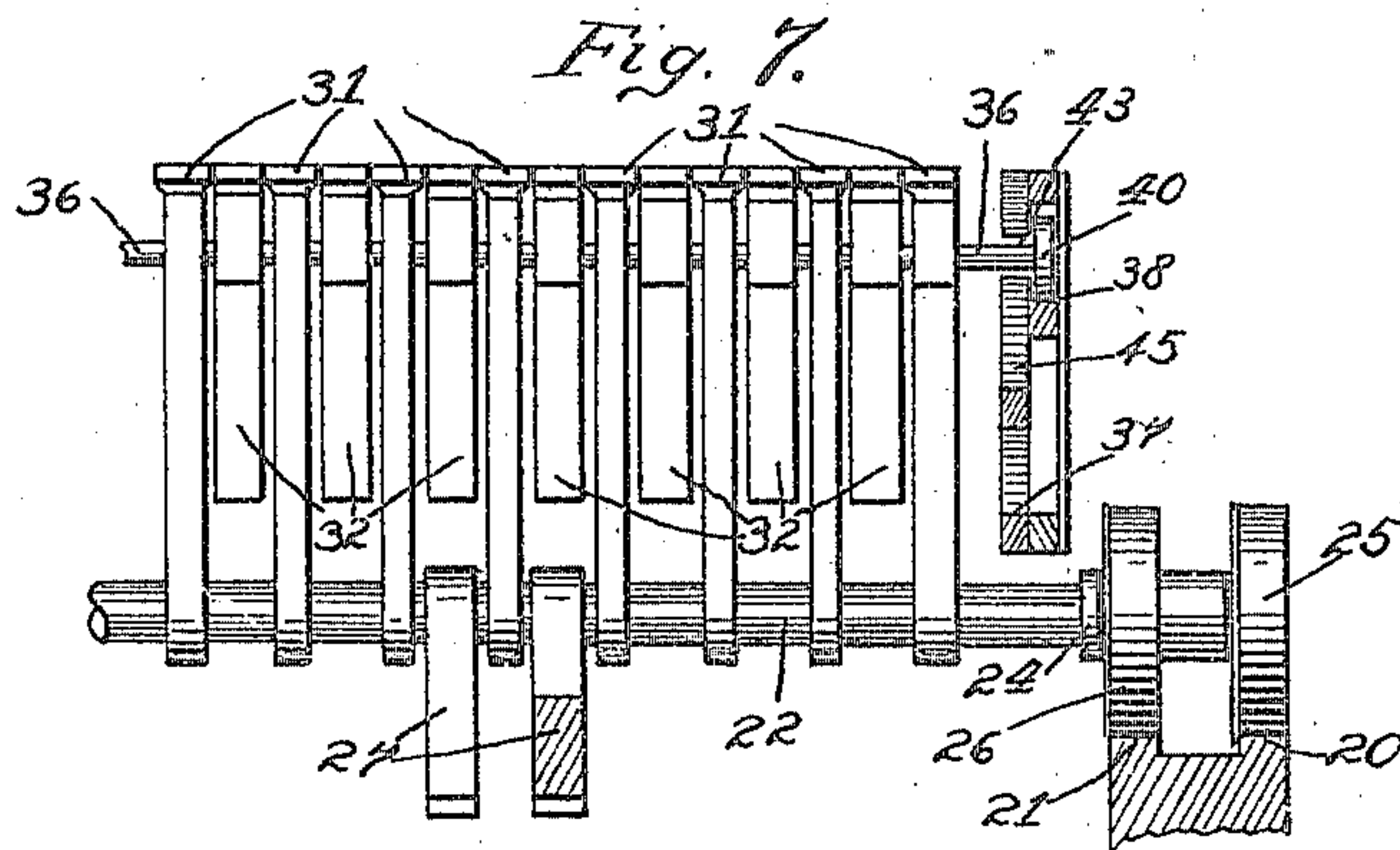
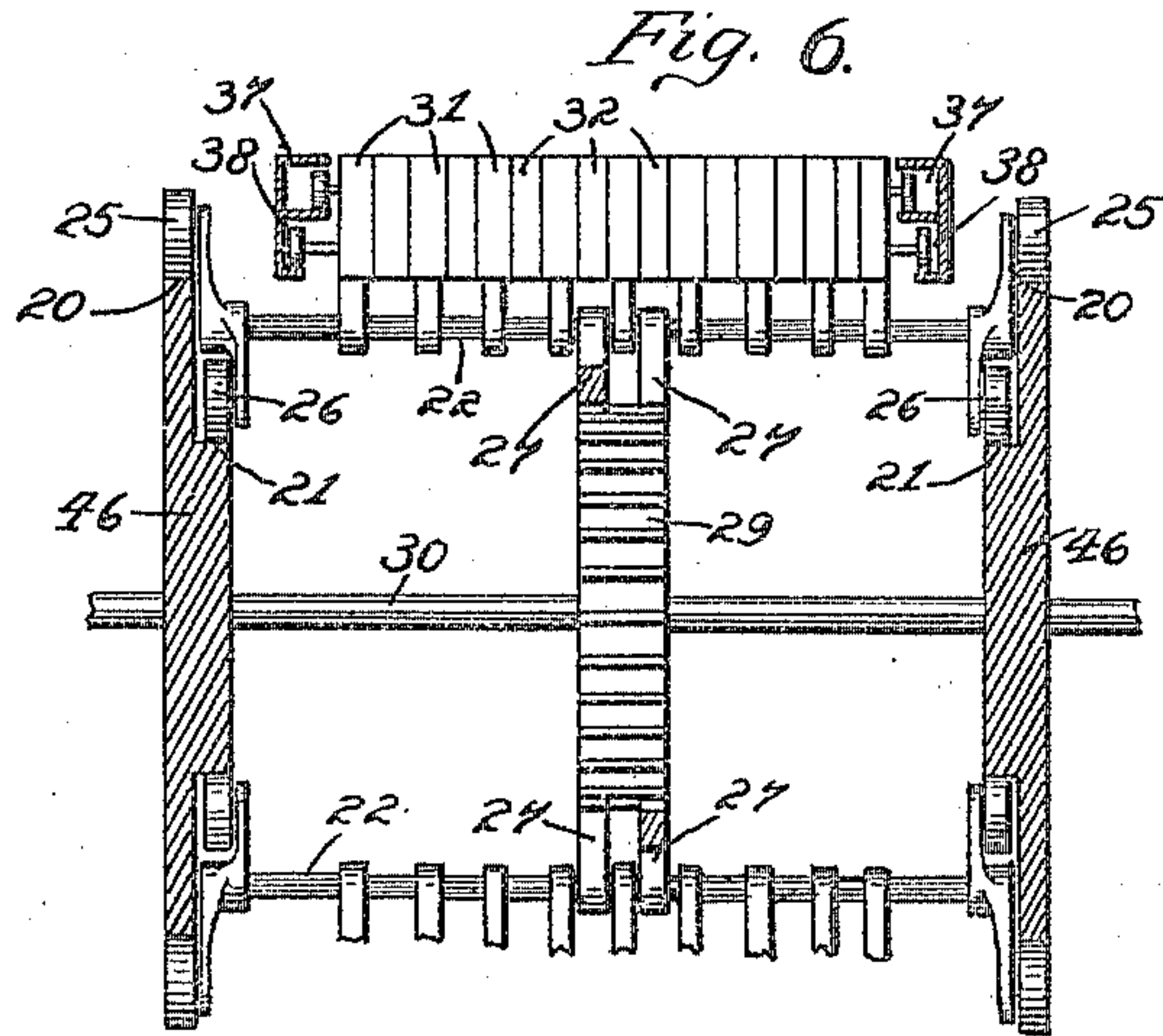
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4 SHEETS—SHEET 4.

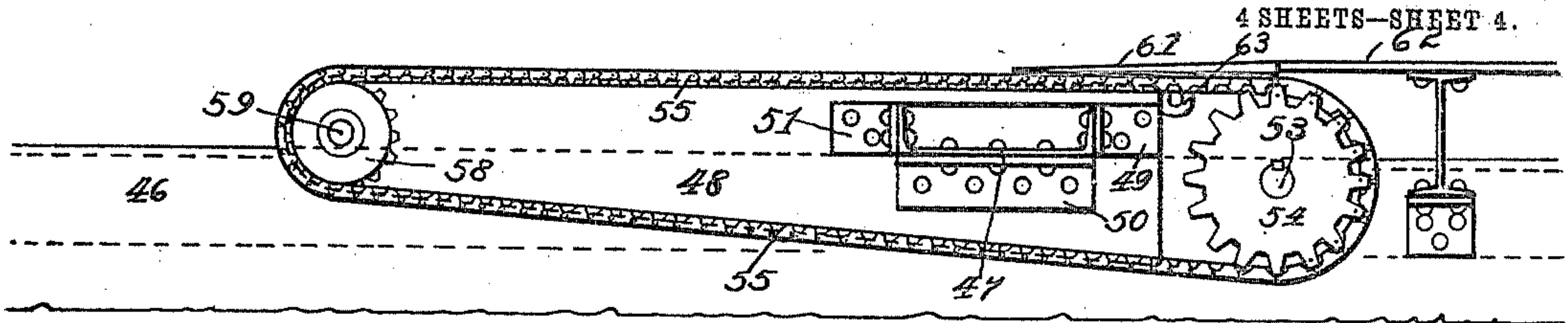


Fig. 10.

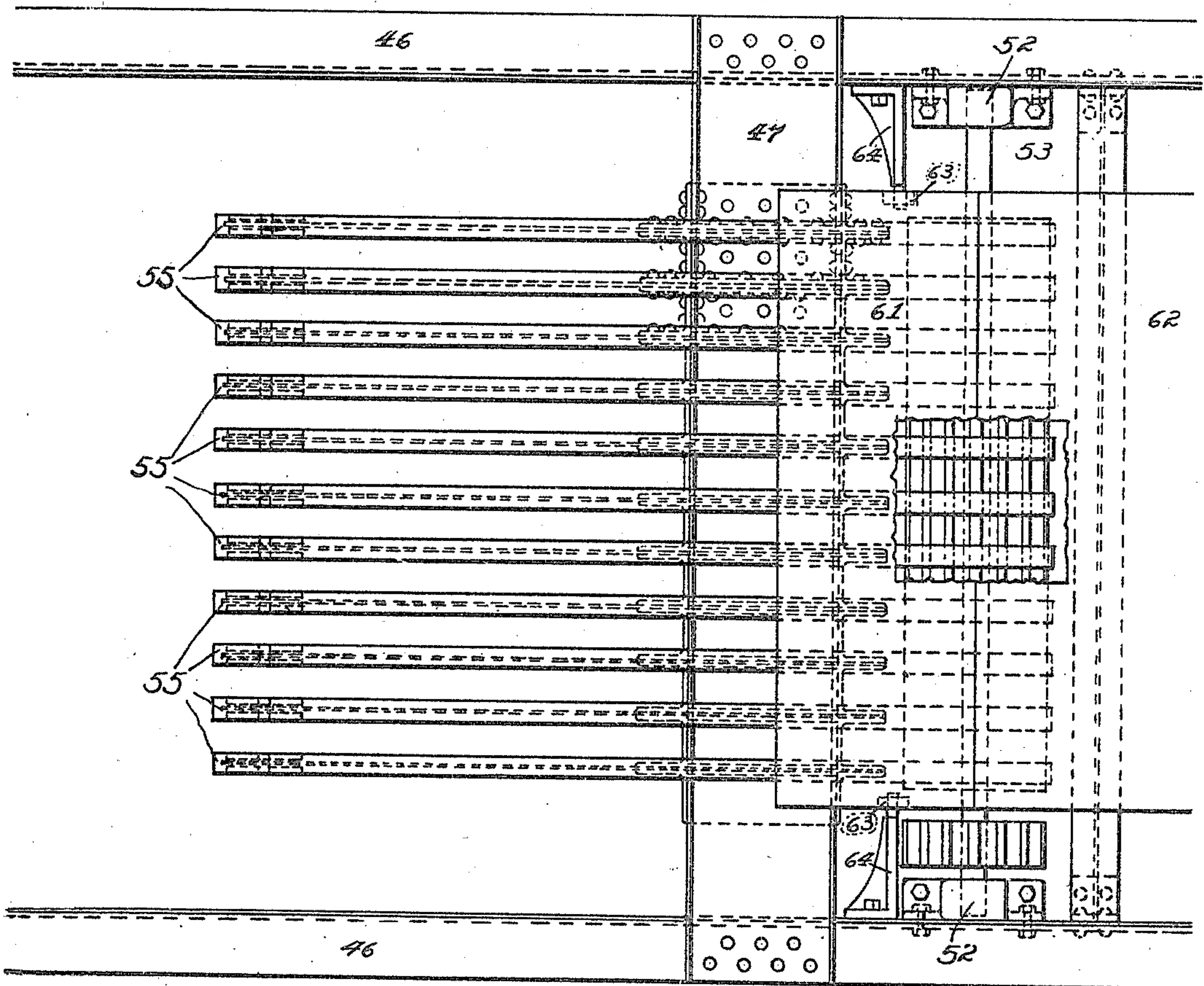


Fig. 11.

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UNITED STATES PATENT OFFICE.

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ELEVATOR.

950,796.

Specification of Letters Patent.

Patented Mar. 1, 1910.

Application filed July 10, 1902, Serial No. 114,996. Renewed June 14, 1909. Serial No. 502,133.

To all whom it may concern:

Be it known that I, CHARLES D. SEEBERGER, a citizen of the United States, residing at Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Elevators, of which the following is a specification.

My invention is concerned with certain new and useful improvements in elevators, and is designed primarily to produce an improved landing mechanism by which the exit of the passenger may be made from the rapidly moving steps to the stationary structure in which it is located with as little jar as possible.

My invention is therefore primarily concerned with a novel auxiliary landing, and secondarily with a novel form of step devised for use with this auxiliary landing, but which might be used elsewhere. Likewise a somewhat different form of step might be used with the same landing.

My invention is finally concerned with a novel design for the riser of a step which is designed to reduce the wear and strain incident to passing from an inclined ascending portion to a horizontal landing portion, and similar points, as will be fully and at length described.

To illustrate my invention, I annex hereto four sheets of drawings in which the same reference characters are used to designate identical parts in all the figures, of which—

Figure 1 is a central longitudinal section through the upper portion of an elevator embodying my invention showing the relation thereof to the auxiliary landing; Fig. 2 is a plan view of the same; Fig. 3 is a top plan view of one end of the step in connection with the various guide rails with which it coöperates; Fig. 4 is a side elevation of the structure shown in Fig. 3; Fig. 5 is a similar view of the same mechanism but on an advanced portion of the tracks; Fig. 6 is a view in section on the line A—A of Fig. 1; Fig. 7 is a view in section on the line B—B of Fig. 4; Fig. 8 is a detail view of a portion of the auxiliary landing mechanism; Fig. 9 is a sectional view of the same on the line C—C of Fig. 8; Fig. 10 is a side elevation of the auxiliary landing mechanism; and Fig. 11 is a plan view of the same with a portion of the floor broken out.

In Fig. 1 I illustrate the upper portion

of a system containing my invention, and it will be understood that the inclined portions and the lower landing may be similar to or are of the customary general design. The tracks 20 and 21, except for the portions to be hereinafter described are of the customary construction employed where four wheeled trucks are used, the two tracks on each side being in different vertical planes throughout their course to accommodate the location of the wheels, and being in different horizontal planes on the inclines to hold the tread surfaces horizontal, and on the same horizontal plane on the landing portions for the same purpose. The steps consist of the axle bars 22 having the arms 23 and 24 rigidly secured on the outer ends thereof upon which are journaled the rear and front wheels 25 and 26 respectively, which coöperate with the tracks 20 and 21 respectively. These axle bars 22 are connected by the preferably U-shaped links 27, which have the rack teeth 28 making rack bars of the links formed on the under edges thereof, and coöperating with and driven by the spur gear 29 secured on the driving shaft 30 preferably located near the upper end of the incline and in position to mesh with both the ascending and descending portions of the system to divide the strain thereon.

All the mechanism thus far described is of any ordinary and approved construction, and may be varied so far as consistent with operativeness without interfering with its coöperation with my invention.

The step body is made up of a series of brackets 31 rigidly secured to the axle bars 22, and separated from each other by spaces of a uniform width in which are placed the depressible sections 32. Referring to Figs. 3 to 5, it will be seen that the rigid sections or brackets 31 have formed therein the elongated vertical slots 33 and 34, through which pass the shafts 35 and 36 which extend through journal bearing apertures in the brackets 32. With this arrangement, it will be apparent that all the brackets 32 can be elevated or depressed simultaneously by means of the shafts 35 and 36, the movements of which are controlled by the ends thereof which coöperate with the tracks or ways 37 and 38 respectively, rigidly secured in any suitable manner adjacent the main tracks 20 and 21. The ends of the shafts 35 and 36 are preferably enlarged to form the wheels 39 and 40, which fit snugly

enough in the ways 37 and 38 respectively to permit them to roll freely therein. At the point where it is desired to depress the brackets 32, and change the tread surface of the steps from the substantially solid to the grooved surface, the inclines 41 and 42 are located in the tracks 37 and 38, the incline 42 being in advance of the incline 41 a distance equal to that between the shafts 35 and 36, so that the tread surface of the bracket 32 will remain horizontal as it is depressed. To accommodate the passage of the shaft 36 through the wall or upper rail of the way or track 37, the recesses 43 and 44 are cut therein at the position shown, the portion 45 which is detached thereby from the main body being conveniently secured to the surface of the track 38. It will be apparent that these tracks 37 and 38 have the same relative arrangement in order to hold the brackets 32 horizontal throughout the operative portion of the stairway the same as the main tracks 20 and 21. By a consideration of the mechanism thus described, it will be apparent that all the sections 32 of any step up to the time it reaches the inclined portions 41 and 42 of the tracks 37 and 38, as seen in Fig. 4, will remain in their elevated position, but as they pass from this position to that shown in Fig. 5, the sections 32 will be depressed so as to leave the spaces between the rigid brackets 31, in order to cooperate with the auxiliary landing to be described, or for any purpose that may be desired.

Referring now to Figs. 8 and 11, it will be seen that between the channel bars 46, or whatever structure may be employed to support the mechanism, I locate the auxiliary landing mechanism, supporting it by the cross beam 47. This cross beam has at intervals corresponding to the spaces occupied by the depressible brackets 32 the horizontal, thin metallic strips 48 rigidly secured thereto as by means of the angle pieces 49, 50 and 51, which are bolted to the cross piece 47 and the horizontal strips 48 respectively. Journaled in suitable bearings 52 mounted on the structure 46 is the shaft 53, which has secured upon the main central portion thereof the grooved cylinder 54, which practically operates as a plurality of sprocket wheels, which mesh with the sprocket chains 55, best shown in detail in Figs. 8 and 9, and which consist of the plurality of links connected by the pivot pins 56, and having the extensions 57 formed on the under side thereof, these extensions 57 being so shaped that when the chain is vertical, a set of teeth are formed thereby, which cooperate with the grooves in the cylinder 54 and with the teeth of the sprocket wheels 58, a pair of which are secured upon a stub bearing 59 supported from the inner end of the vertical plate 48, so that the

chains 55 cooperate with the cylinder 54 and the sprocket wheels 58, and are driven by power which may be applied in any suitable manner to the shaft 53. This power is preferably applied so that the auxiliary landing formed by these chain belts 55 moves at a less rate of speed than the steps proper. The plates 48 extend throughout the edges thereof into the grooves 60 formed in the extensions 57 of the chain links so as to prevent their being laterally displaced as well as to support them. Referring to Fig. 2, it will be seen that the chain belts 55 extend between the rigid brackets 31 of the steps and serve to receive the traveler as he is automatically discharged thereon by the steps sinking down as they do in passing around the curve at the end. This auxiliary landing preferably moving at a slower rate of speed, the passenger is, without any material jar, transferred from the rapidly moving steps to the auxiliary landing, whence he can step onto the float 61, which consists of a plate, preferably metallic, arranged with its inner edge to rest on the surface of the chain belts 55, and with its outer edge on the landing proper 62. To hold the float 61 in position, I provide the slotted ears 63 on the under surface thereof, with which cooperate pins carried by the brackets 64 secured to the structure 46 so as to prevent any horizontal movement of the float while permitting it to move vertically as freely as may be necessary to conform to the variations and the heights of the steps or auxiliary landings with which it cooperates.

Inasmuch as the tread surface of the step is at a greater distance from the tracks than the wheel centers, it will be apparent that in passing over convex portions of the tracks, as from an ascending inclined portion to the horizontal landing portion, the velocity of the tread is greater than the wheel centers, and this is manifested by a tendency to strain the step structures and cause them to bind together at their upper edges. To relieve this I round off the corner of the nosing a trifle, as best seen at 65 in Figs. 4 and 5, which serves to overcome this difficulty.

While I have herein shown and described my invention as embodied in the form which I at present consider best adapted to carry out its purposes, it will be understood that it is capable of wide modifications, and that I do not desire to be limited in the interpretation of the following claims except as may be necessitated by the state of the prior art.

What I claim as new, and desire to secure by Letters Patent of the United States is—

1. The combination with an endless movable carrier, of a landing, said landing consisting of a fixed frame work and one or more movable parts or sections, and means for moving the upper surface of the mov-

able portion of said landing in the same direction as and independently of the moving carrier.

2. The combination with an endless movable stairway, of a landing, said landing consisting of a fixed frame work and one or more movable parts or sections, and means for moving the upper surface of the movable portion of said landing in the same direction as and independently of the moving stairway.

3. In a device of the class described, a step composed of a plurality of rigid brackets and intermediate sections depressible so as to form a solid or fluted tread surface, as may be desired.

4. In a device of the class described, the combination with the step composed of a plurality of rigid brackets and movable intermediate sections, and means for depressing the intermediate sections automatically at any desired point.

5. In a device of the class described, the combination with the step composed of a plurality of rigid brackets and movable intermediate sections, and means for depressing the intermediate sections automatically at any desired point consisting of rods connected to the movable sections, and cam guide rails coöperating with the ends of the rods.

6. In a device of the class described, the combination with the step composed of a plurality of rigid brackets and movable intermediate sections, and means for depressing the intermediate sections automatically at any desired point consisting of rods connected to each of the movable sections and passing through vertical slots in the rigid brackets, and cam guide rails at the ends of said steps coöperating with the ends of the rods.

7. In a device of the class described, the combination with the step composed of a plurality of rigid brackets and movable intermediate sections, and means for depressing the intermediate sections automatically at any desired point consisting of the rods having the wheels on the ends thereof journaled in the movable sections, and the guide rails at the ends of the steps in which the wheels on the rods roll, substantially as and for the purpose described.

8. In a device of the class described, the combination with the step composed of a plurality of rigid brackets and movable intermediate sections, and means for depressing the intermediate sections automatically at any desired point consisting of two rods passing through the movable sections and having their ends terminating outside of the steps in different vertical planes, and two sets of cam tracks in different vertical planes coöperating with the two rods and having their cam portions spaced apart the distance

between the two rods so as to hold the sections horizontal as they are depressed.

9. In a device of the class described, the combination with the step composed of a plurality of rigid brackets and movable intermediate sections, and means for depressing the intermediate sections automatically at any desired point consisting of the two rods connected to the movable sections and passing through two vertical slots in the rigid brackets and terminating in different vertical planes at their ends outside of the step, and two cam tracks in different vertical planes at each end of the step coöperating with the ends of said rods and having their cam portions spaced apart a distance equal to the distance between the rods so that the surfaces of the sections remain horizontal as they are depressed.

10. In a device of the class described, the combination with the ways, of a plurality of steps traveling thereon and having depressible sections to form fluted tread surfaces at the landings, and the auxiliary landing mechanism adapted to extend into the depressed portions of the steps on the landings for the purpose described.

11. In a device of the class described, the combination with the ways, of a plurality of steps traveling thereon and having the fluted tread surfaces at the landings, and the auxiliary landing mechanism adapted to extend into the depressed portions of the steps on the landings for the purpose described consisting of a plurality of suitably supported narrow belts, and means for driving the same.

12. In a device of the class described, the combination with the ways, of a plurality of steps traveling thereon and having the fluted tread surfaces at the landings, and the auxiliary landing mechanism adapted to extend into the depressed portions of the steps on the landings for the purpose described consisting of a plurality of suitably supported narrow belts, and means for moving said belts at a different lineal rate of speed than the steps are moved.

13. In a device of the class described, the combination with the ways, of a plurality of steps traveling thereon and having the fluted tread surfaces at the landings, and the auxiliary landing mechanism adapted to extend into the depressed portions of the steps at the landings for the purpose described, and consisting of a plurality of narrow belts supported by the plates 48, and means for moving said belts.

14. In a device of the class described, the combination with the ways, of a plurality of steps traveling thereon and having the fluted tread surfaces at the landings, and the auxiliary landing mechanism adapted to extend into the depressed portions of the steps at the landings for the purpose de-

scribed, and consisting of a plurality of narrow belts made up of the links having projections on the under surface thereof constituting teeth, supporting pinions for said belts at one end thereof, and driving pinions at the other end thereof meshing with said belts to advance them for the purpose described.

15. In a device of the class described, the combination with the auxiliary landing mechanism consisting of the cross beam 47 supported from the frame-work 46 and in turn having the plates 48 secured thereto, of the gear pinions 58 journaled on either side of said plates on the shafts 59 at one end thereof, the gear pinion 54 at the other end thereof, and the chains made up of the links 55 having the projections 57 thereon forming teeth which mesh with the pinions and having the recesses 60 therein into which the plates 48 extend to support the belts formed by said links.

16. In a device of the class described, the combination with the moving landing, of the rigid stationary landing, and the floating plate 61 interposed between the stationary landing and the auxiliary landing substantially as shown and described.

17. In a device of the class described, the combination with the moving landing, of the stationary landing, the floating plate 61 having the lugs 63 thereon with the elongated vertical slots therein, and the pins extending from the supporting structure into said slots, substantially as and for the purpose described.

18. A moving carrier, and a reproach therefor including a plurality of forwardly moving units constructed and operating in such manner as to effect the transfer of passengers or freight from the main carrier at reduced speed.

19. A moving carrier and an auxiliary landing including a plurality of forwardly moving units, constructed and operating in such a manner as to effect the transfer of passengers or freight from the main carrier at reduced speed.

20. A moving carrier and an auxiliary landing including a plurality of units having axes substantially at right angles to the line of movement of the main conveyer, constructed and operated in such manner as to effect a reduction of speed of passengers or freight resting thereon below the speed of the main conveyer.

21. In a traveling stairway having a framework, a grated landing, an endless flight of grated steps, and means to operate the same, and means whereby the tread-surface of the steps enters the landing and descends therethrough.

22. In a traveling stairway having a framework, a grated landing, an endless flight of grated steps, and means to operate the same, and means whereby the tread-surface of the steps enters the grated landing and then descends through the grated landing to deposit the passengers thereon.

23. In a traveling stairway having a framework, a horizontal grated landing, an endless flight of grated steps and means to operate the same, the means to cause the tread-surface of the steps to enter the tread-surface of the grated landing and then vertically descend through and deposit the passenger on the landing, and to preserve the tread-surface substantially horizontal.

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

CHARLES D. SEEBERGER.

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