

No. 890,802.

PATENTED JUNE 16, 1908.

C. D. SEEBERGER.
ELEVATOR.

APPLICATION FILED NOV. 8, 1902. RENEWED OCT. 25, 1906.

3 SHEETS—SHEET 1.

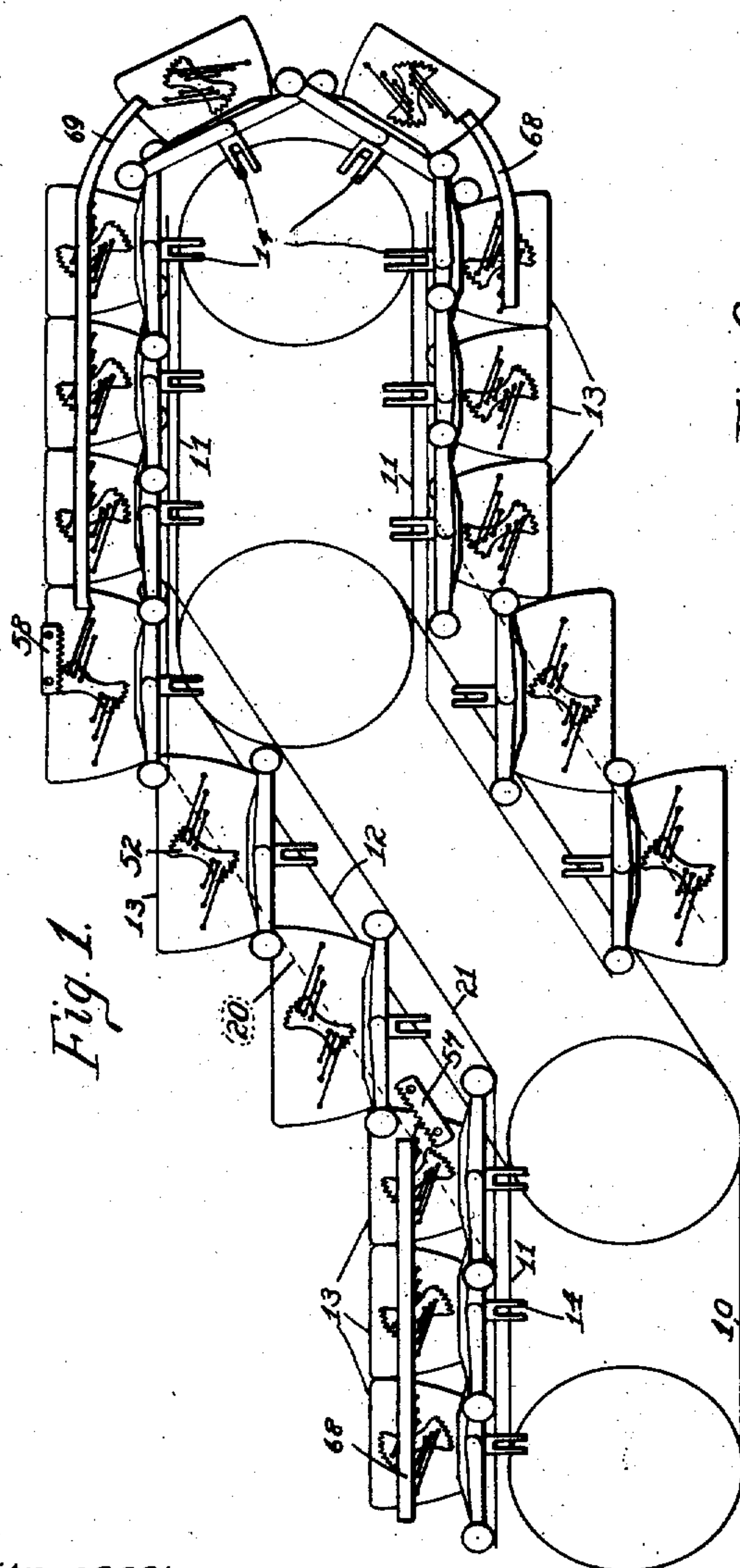
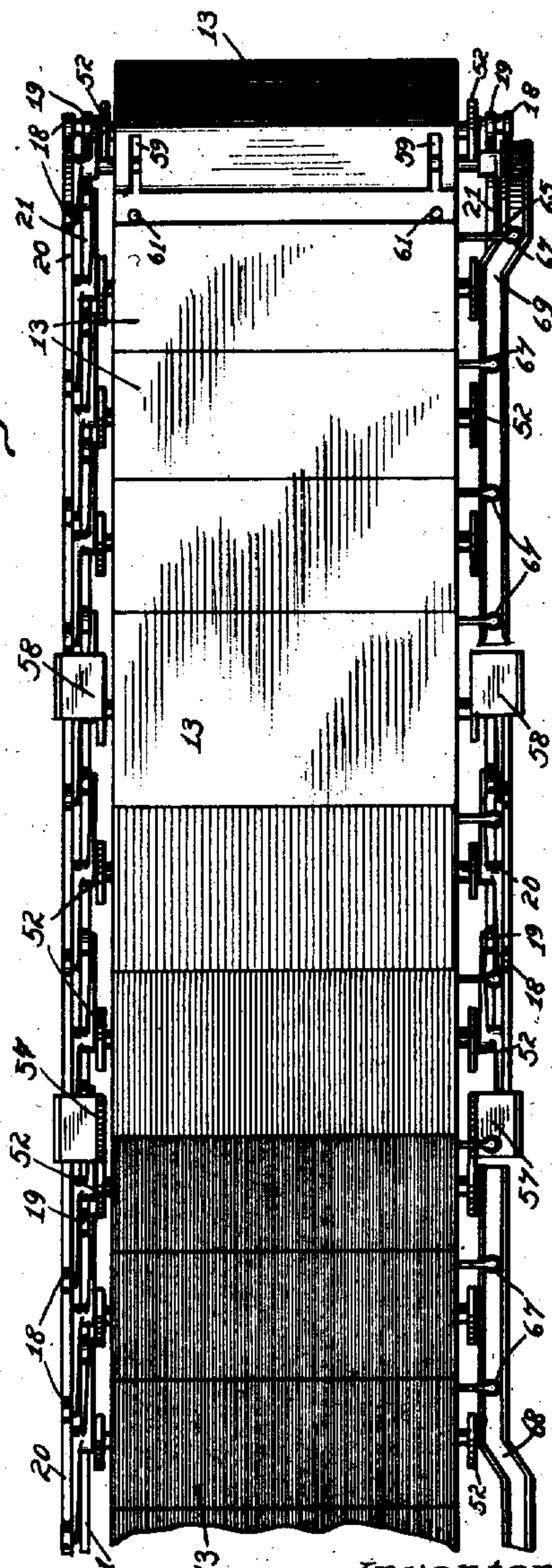


Fig. 1.

Fig. 2.



Witnesses:

E. Molitor

R. H. Gustafson.

Inventor

Charles D. Seeberger,

by Coburn, McRoberts & McClary,
ATTYS.

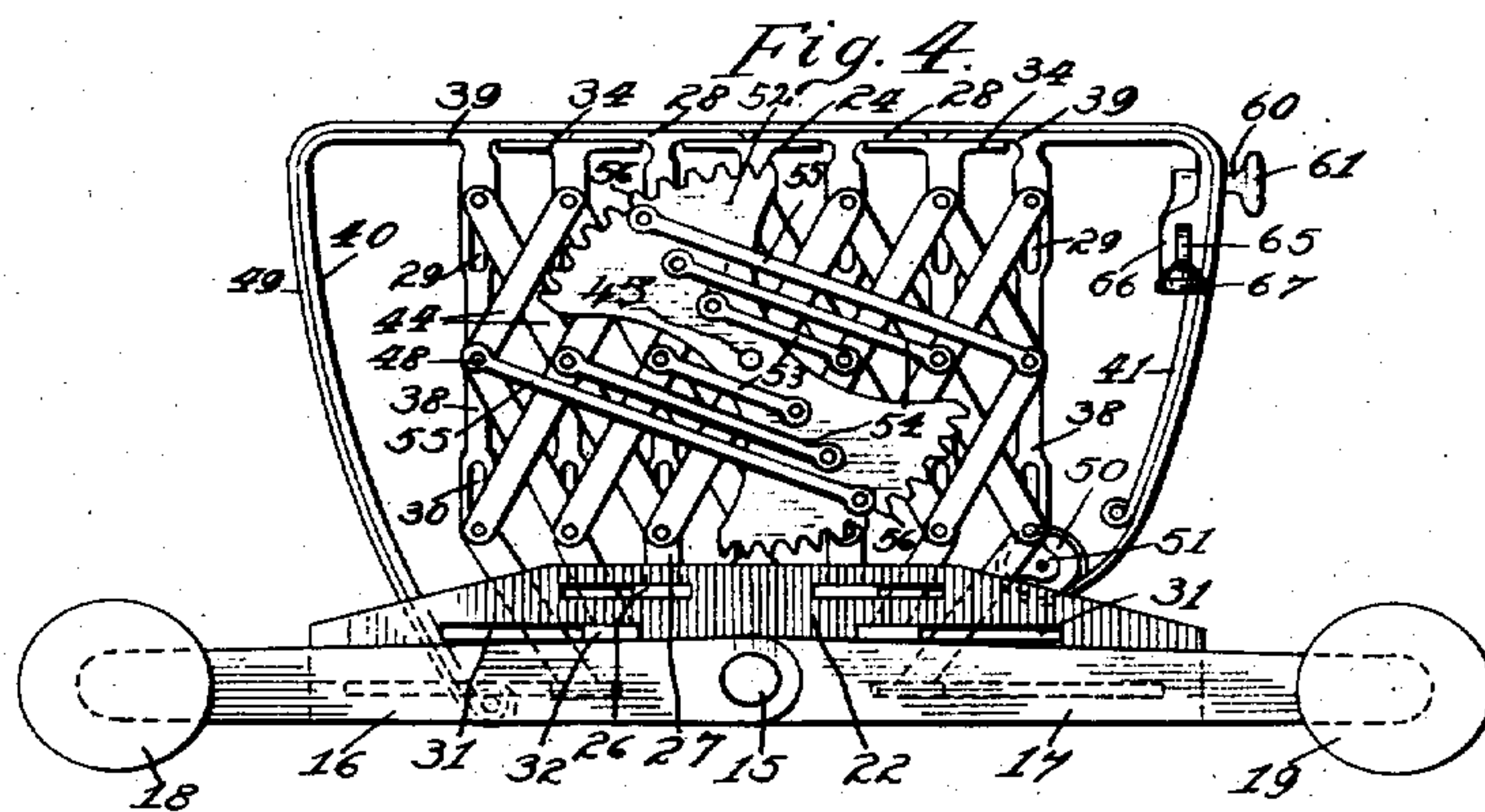
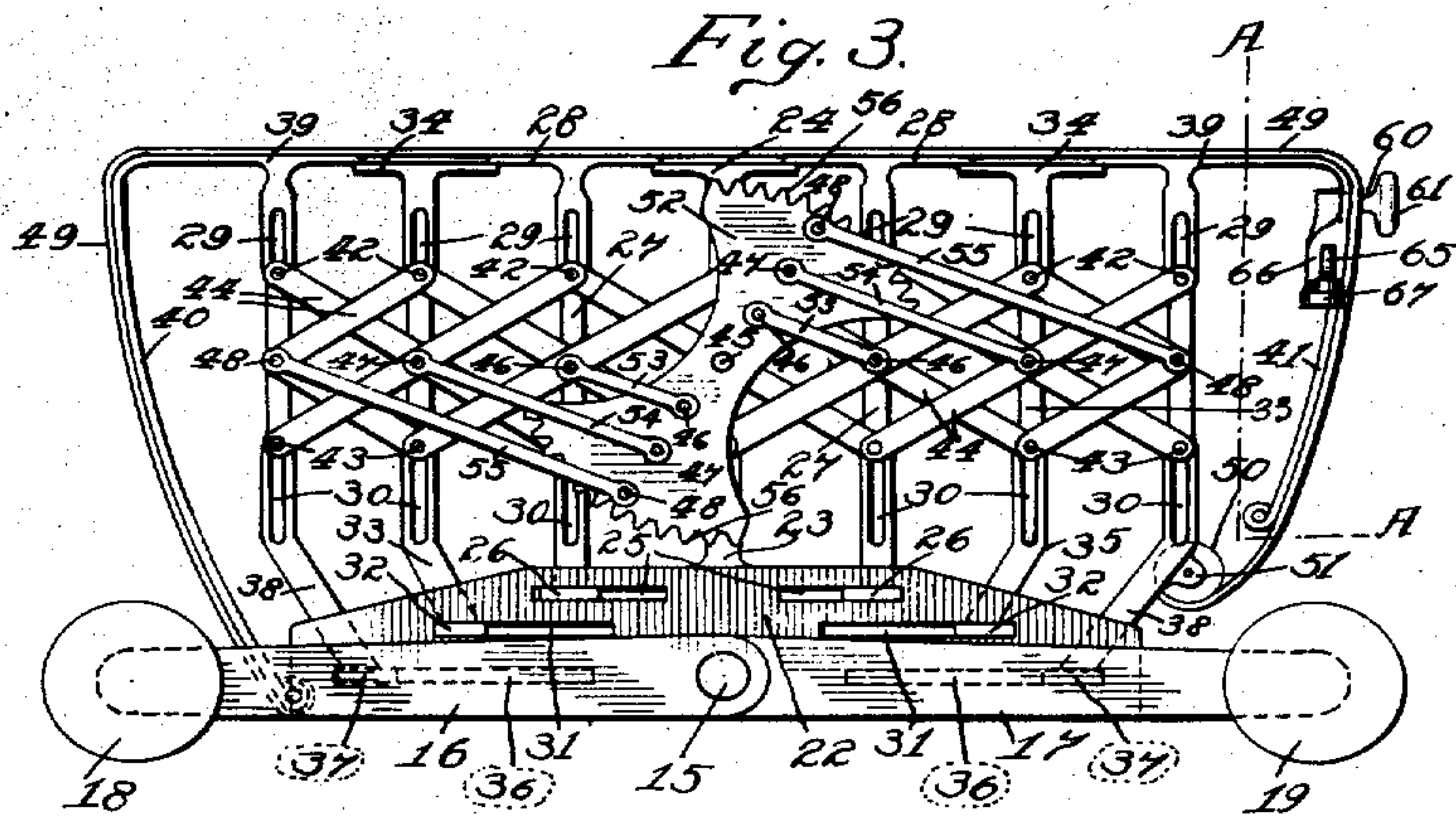
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R. H. Gustafson.

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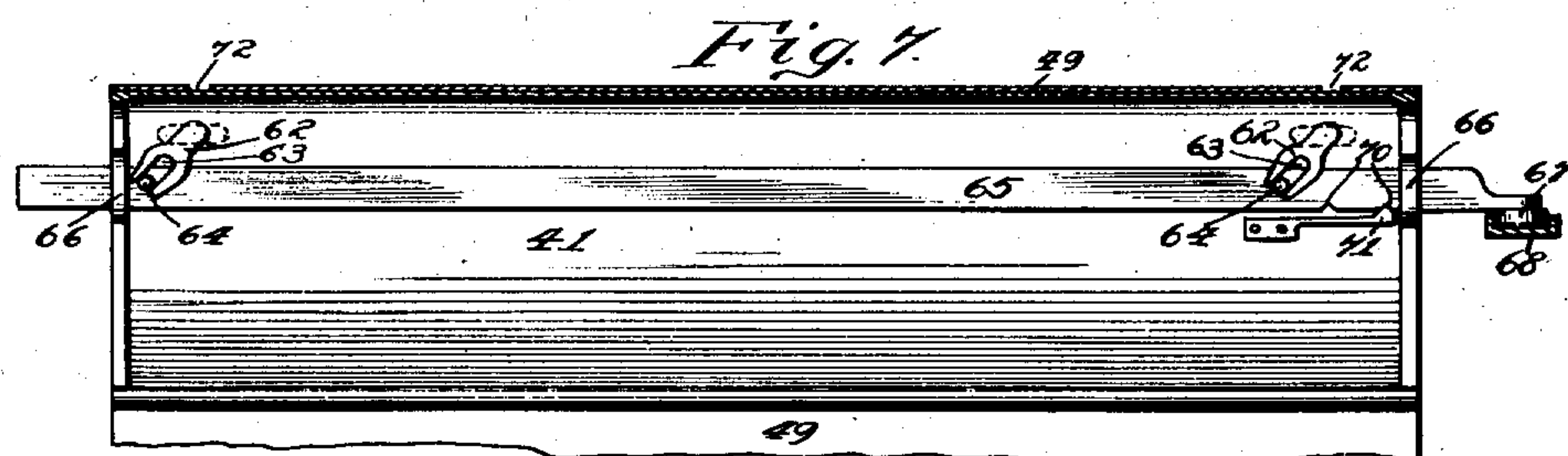
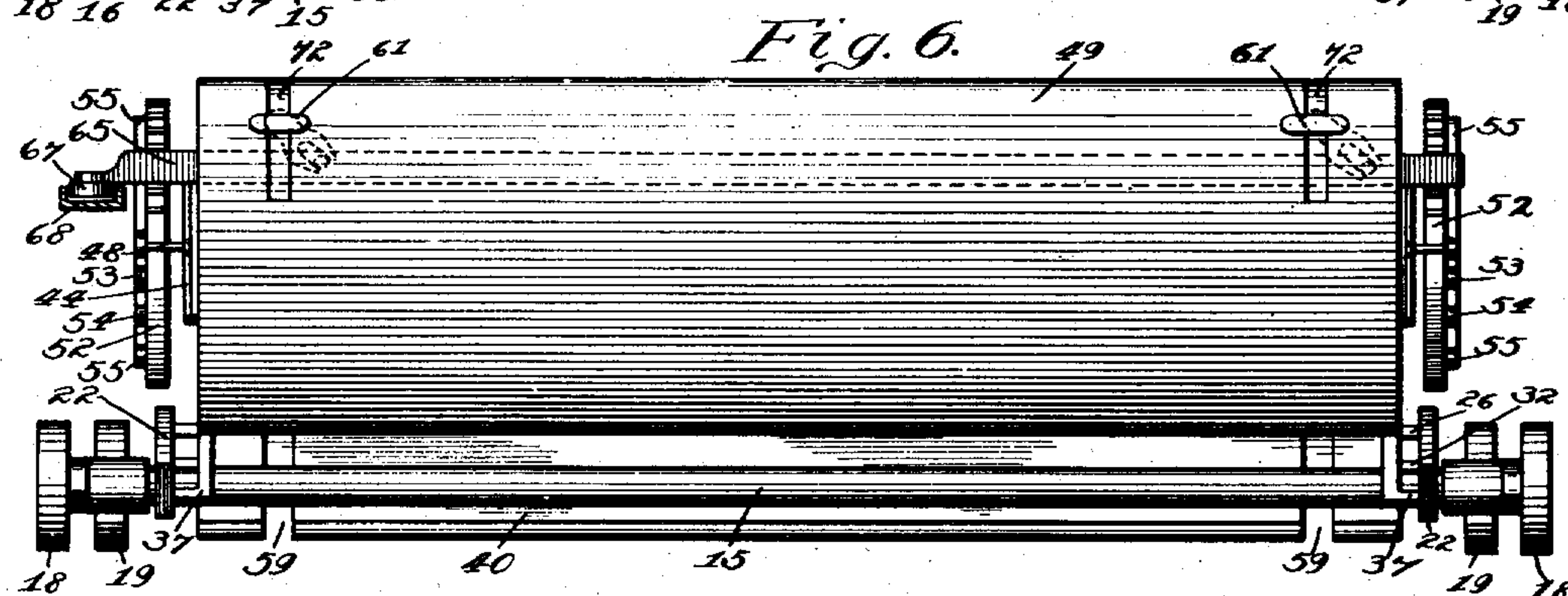
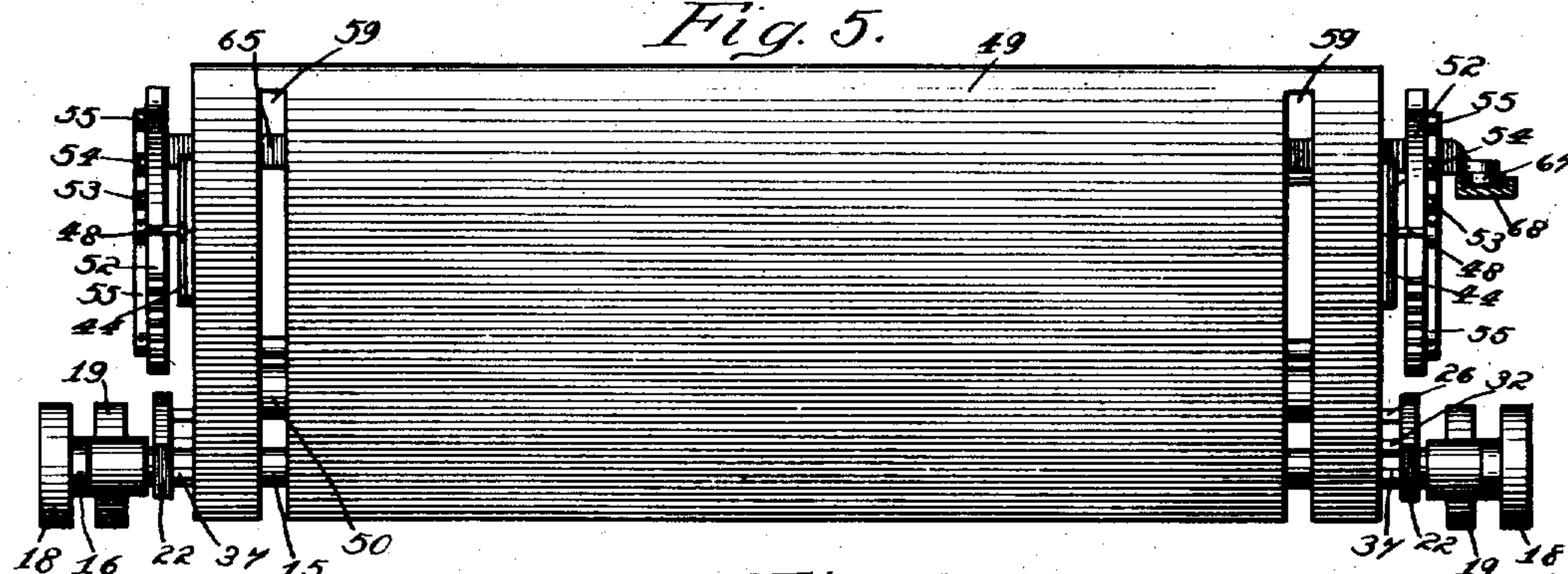
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3 SHEETS—SHEET 3.



Witnesses:
J. Molitor
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UNITED STATES PATENT OFFICE.

CHARLES D. SEEBERGER, OF YONKERS, NEW YORK.

ELEVATOR.

No. 890,802.

Specification of Letters Patent.

Patented June 16, 1908.

Application filed November 8, 1902, Serial No. 130,503. Renewed October 25, 1905. Serial No. 284,321.

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 present invention is concerned with certain improvements in elevators, such as moving stairways of the general type shown in my application Serial No. 110,641, filed June 7, 1902. In the aforesaid application, the steps telescope into each other on the landings, while in my present construction I employ a step that is capable of having its tread surface widened or narrowed, as the case may be; in the construction employed, the tread surfaces being narrowed on the horizontal landings, and extended on the inclined portions where the driving mechanism runs more rapidly.

My invention is further concerned with the step capable of having its tread surface contracted and expanded, irrespective of the purpose for contracting or expanding it.

My invention is further concerned with a novel system of and mechanism for automatically connecting and disconnecting the steps as they pass certain points on the ways, which may be applied to any desired system where it is needed.

To illustrate my invention, I annex hereto three 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 side elevation, diagrammatic in its nature, illustrating my present invention; Fig. 2 is a top plan view of the same; Fig. 3 is an end elevation of one of the steps detached showing the tread surface expanded; Fig. 4 is a similar view showing it contracted; Figs. 5 and 6 are front and rear elevations of one of the steps; and Fig. 7 is a sectional view of the same on the line A—A of Fig. 3.

I have illustrated my invention as applied to a moving stairway of the type in which a cable 10 at the lower landing runs at a certain rate of speed, and a cable 11 at the upper landing runs at preferably the same rate of speed, while the steps on the incline are driven by the cable 12 which runs at a higher rate of speed. The steps 13 are not connected with each other, except temporarily in the manner hereinafter specified, and are

each provided with the cable grips 14 by which they are attached to the cables so as to be moved thereby, the construction of the cables, grips, and automatic mechanism for operating them being the same as that shown in my aforesaid application No. 110,641, or any similar suitable mechanism. The steps 13 are provided with the customary axle bars 15 having the arms 16 and 17 on their ends, the arms 16 having the wheels 18 journaled on their outer ends, and the arms 17 being similarly provided with the wheels 19. These wheels 18 and 19 are on different planes, as is customary in this class of devices, in order to cooperate with the different tracks upon which they run, the rear wheels 18 running on the tracks 20 and the forward wheels 19 running on the tracks 21 in order to keep the tread surfaces of the steps horizontal throughout the portions of the tracks that are utilized for carrying purposes. The mechanism hitherto described is of the ordinary construction or similar to that shown in my aforesaid application No. 110,641 and claimed therein.

At each end of each step just inside of the arms 16 and 17 is secured the vertical plate 22; which has projecting upward from the center thereof a rigid standard 23, which terminates in the flat horizontal plate 24, extending the length of the step and connecting the two standards 23. Formed in the upper portion of the plate 22 on either side of the standard 23 and close thereto are the comparatively short horizontal slots 25, in which slide the horizontal bases 26 of the two sliding standards 27, which are provided at their upper ends with the horizontal flat plates 28 which in the expended position of the step slightly overlap the plate 24. These standards 27 are also provided with the vertical slots 29 and 30 for the purpose to be described. Beneath and a little outside of the slots 25 are the similar, but longer, slots 31, in which slide the horizontal bases 32 of the second pair of movable standards 33, which are similar in all respects to the standards 27, except that their top plates 34 extending across the top of the steps are beneath the plates 28, and are slightly overlapped thereby when the step is extended. As a convenience in the construction of the steps, I preferably incline the lower ends of the standards 33 inward, as shown at 35. Formed in the plates 22 beneath and somewhat outside of the slots 31 are the still

longer horizontal slots 36, which receive the sliding bases 37 of the pair of movable standards 38. These standards 38 are similar to the standards 33, except the plates 39 at their upper ends overlap the plates 34, in this respect resembling the plates 28 of the standards 27. These plates 39 are extended, as shown at 40 on one side and at 41 on the other side to form the body of the risers of the steps, which are of the curved form customarily employed in this class of devices. The standards 23, 27, 33 and 38 are all provided with the vertical slots 29 and 30, with which cooperate the pins 42 and 43 of the set of lazy-tongs 44, which are supported at their center by the pin 45 projecting outward from the standard 23, and which are secured at their centers to the standards 27, 33 and 38 by the pins 46, 47, and 48, respectively, the effect of this construction being that the standards can be extended to the position shown in Fig. 3 or contracted to that shown in Fig. 4, thus furnishing the step with a broad or narrow tread surface as may be desired. To make the outer surface of the tread surface and the risers substantially flush throughout in the expanded position, I provide a flexible covering 49, which is secured to the bottom of the extension 40, and passes over the adjacent riser, the tread surface, the other riser, and is finally attached to the strong spring roller 50 journaled in the brackets 51 formed on the adjacent standards 38.

As will be seen from Fig. 1, the steps are in the contracted position shown in Fig. 4 on the landings, and in the expanded positions shown in Fig. 3 on the inclines of the carrying and return runs of the elevator, and to automatically contract and expand the steps, I provide the double gear segments 52, pivoted at each end of the steps, preferably on the pins 45. These segments are connected at different radial distances from the pin 45 with the pins 46, 47 and 48 by the links 53, 54 and 55, which vary in their lengths as is necessary to expand or contract the step by the swinging of the segment from the position shown in Fig. 3 to that shown in Fig. 4, and vice versa. On the two ends of the segments, I form the rack teeth 56 which mesh with the rack bars 57 when they are to be expanded or the rack bars 58 when they are to be contracted, these rack bars being suitably supported from the main structure and located, as seen in Fig. 1, where the tracks change from the horizontal to the incline, and vice versa.

I preferably employ mechanism for connecting the steps on the operative portions of the tracks, and for this purpose, I form in the extension 40 and the adjacent covering 49 the vertical slots 59, through which pass the shanks 60 of one or more buttons having the elongated heads 61. As it is necessary to separate these steps in going around the

curves, I provide means for turning the buttons from the engaging position shown in Fig. 6 to a position at right angles thereto in which the heads will be free to pass out of the slots 59, and for this purpose I extend the shanks 60 through suitable bearings in the extension 41 and provide them with the downwardly projecting arms 62 having the elongated slots 63 therein cooperating with the pins 64 on the bar 65 mounted to slide in suitable bearings 66 formed on the inner face of the ends of the extensions 41. On one end of each bar 65, I place a contact member 67, which preferably takes the form of an anti-friction roller, which cooperates with the cam tracks 68 and 69, the track 68 serving to turn the buttons to engaging position when the operative portion of the track is reached, and the track 69 serving to turn them to disengaging position when it becomes necessary to go around the curve. By reason of this arrangement the steps are interlocked on the transporting portion of the system and while so interlocked or connected provide a unitary moving structure. To hold the bar 65 in whichever position of adjustment it may be thrown without the necessity of employing continuous cam tracks cooperating with the roller 67, I provide a pair of notches 70 on the under surface of the bar with which cooperates the spring detent 71, to hold the bar firmly but yieldingly in either position of adjustment. To accommodate the rolling and unrolling of the flexible covering 49 with reference to the buttons 61, I make the slots 72 therein extend through so much of the adjacent covering as is necessary.

While I have shown 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 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. In a device of the class described, a step having its tread surface expansible and contractible throughout its entire length.
2. In a device of the class described, a step having its tread surface expansible and contractible and of unbroken continuity.
3. In a device of the class described, the combination with the tracks, of the carriers having their upper surfaces expansible and contractible throughout their entire lengths, and means for automatically expanding or contracting said surfaces at certain points of the tracks.
4. In a device of the class described, the combination with the wheel-base having the rigid standards thereon, of the sliding standards mounted therein and movable to and from the rigid standards, plates connecting

said standards and forming the basis of a carrying surface, and lazy-tong connections between said standards.

5 In a device of the class described, the combination with the wheel-base having the rigid standards thereon, of the sliding standards supported thereon and movable to and from the rigid standards, overlapping plates connecting said standards and constituting the basis of a carrying surface, and lazy-tong connections between said standards.

10 6. In a device of the class described, the combination with the tracks, of the carriers each consisting of the wheel-base having the rigid standards thereon and the sliding standards supported thereby and movable to and from the rigid standards, plates connecting said standards and constituting the basis of the tread surface of the carrier, lazy-tong connections between said standards; and means for automatically moving said lazy-tongs to expand or contract the tread surface at certain points on the tracks.

25 7. In a device of the class described, the combination with the tracks, of the carriers each consisting of the wheel-base having the rigid standards thereon and the sliding standards supported thereby and movable to and from the rigid standards, plates connecting said standards and constituting the basis of the tread surface of the carrier, lazy-tong connections between said standards; and means for automatically moving said lazy-tongs to expand or contract the tread surface at certain points on the tracks, consisting of members pivotally connected to the rigid standards on the carriers, links connecting said members and the lazy-tong elements, and means for swinging said member at the desired points.

40 8. In a device of the class described, the combination with the tracks; of the steps each consisting of the wheel-base having the rigid standards thereon, the sliding standards supported thereby and movable to and from the rigid standards, plates connecting said standards and constituting the basis of the tread surface of the step, lazy-tong connections between said standards, segments pivotally mounted on the rigid standards and having teeth on their peripheries, links connecting said segments and the lazy-tong elements; and racks on the supporting structure suitably located to cooperate with the teeth of the segments to contract or expand the steps automatically at the points desired.

55 9. In a device of the class described, the combination with the wheel-base having the rigid standards thereon and the vertical plates having the horizontal slots therein, of the sliding standards having the elongated horizontal bases sliding in said slots and movable to and from the rigid standards, plates connecting said standards and constituting the basis of the tread surface, and

lazy-tong connections between said standards.

10. In a device of the class described, the combination with a step having its tread surface expansible and contractible, of a covering therefor adapted to contract and expand with the tread surface.

11. In a device of the class described, the combination with a step having its tread surface expansible and contractible, of a covering therefor adapted to contract and expand with the tread surface consisting of a flexible sheet secured at one end to the step and having the other end wound on a spring-roller suitably supported by the step.

12. In a device of the class described, the combination with the ways, of a plurality of carriers, driving mechanism therefor, connections between the adjacent carriers, and means for automatically connecting and disconnecting said carriers as they pass certain points in the ways.

13. In a device of the class described, the combination with the ways, of a plurality of carriers, driving mechanism to which they can be individually connected and disconnected, connections between the adjacent carriers, and means for automatically connecting and disconnecting said carriers as they pass certain points in the ways.

14. In a device of the class described, the combination with the ways, of a plurality of carriers, driving mechanism therefor, connections between the adjacent carriers, and means for automatically connecting and disconnecting said carriers as they pass certain points in the ways consisting of the rotatable button having an elongated head projecting from each carrier and engaging a vertical slot in the riser of the adjacent carrier, and means for rotating said button at various points on the track.

15. In a device of the class described, the combination with the ways, of a plurality of carriers, driving mechanism therefor, connections between the adjacent carriers, and means for automatically connecting and disconnecting said carriers as they pass certain points in the ways, consisting of the rotatable button having an elongated head projecting from each carrier and engaging a vertical slot in the riser of the adjacent carrier, and means for rotating said button at various points on the track consisting of a sliding bar extending to the end of the carrier, and cams cooperating with the end of said bar.

16. In a device of the class described, the combination with the ways, of a plurality of carriers the riser of each of which is provided with vertical slots; driving mechanism therefor, rotatable buttons having elongated heads projecting from each carrier and adapted to cooperate with the vertical slots in the riser of the adjacent carrier, yokes connected with said buttons on the inner side of the riser, a

sliding bar extending longitudinally on the interior of the riser and having pins engaging said yokes, cam tracks on the supporting structures, and antifriction rollers on the sliding bars engaging said cam tracks.

17. In a device of the class described, a step having an expansible and contractible tread surface of unbroken continuity.

18. In a device of the class described, the combination of a plurality of carriers having expansible and contractible tread surfaces of unbroken continuity, and means for expanding or contracting said surfaces.

19. In a device of the class described, the combination of a plurality of carriers having expansible and contractible tread surfaces of unbroken continuity, and means for expanding or contracting said surfaces independently of each other.

20. In a device of the class described, the combination of a plurality of carriers having expansible and contractible tread surfaces of unbroken continuity, and means for automatically expanding or contracting said surfaces.

21. In a device of the class described, the combination of a plurality of carriers having expansible and contractible tread surfaces of unbroken continuity, and means for automatically expanding or contracting said surfaces independently of each other.

22. In a device of the class described, the combination of a plurality of carriers having expansible and contractible tread surfaces of unbroken continuity, and means for automatically expanding or contracting said surfaces independently of each other and during the movement of the carriers.

23. In a device of the class described, the combination with a plurality of carriers provided with mechanism for connecting them to each other, of means for automatically actuating said mechanism to connect and disconnect the carriers.

24. In a device of the class described, the combination with a plurality of carriers, of means for automatically connecting and dis-

connecting the carriers during the movement of the latter.

25. In a device of the class described, the combination with a way, of a series of steps adapted to run on said way, means for driving the steps, and means to connect said steps together on the way.

26. In a conveyer, interlocked sections forming a unitary structure upon an inclined way.

27. In a conveyer, interlocked tread surfaces forming a unitary device on the incline.

28. In a device of the class described, a unit composed of interlocked steps on the incline.

29. In a device of the class described, a unit composed of interlocked steps on the incline, and means for driving the steps as a unit.

30. In a device of the class described, a way having inclined and horizontal portions, of a series of steps adapted to run on the way, means for driving the steps, and means for connecting the steps to form a unitary structure on the said inclined and horizontal portions of the way.

31. In a conveyer, a series of moving steps, ways on which the steps travel comprising horizontal and inclined portions and end-curves, means to connect the steps together on the horizontal and inclined portions of the ways, and means to disconnect them at the end-curves.

32. In a conveyer, a way having horizontal and inclined portions and end-curves, a series of steps traveling on the way and each provided with means which interlocks with an adjacent step on the inclined and horizontal portions and unlocks at the curves.

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

CHARLES D. SEEBERGER.

Witnesses:

E. W. MARSHALL,
W. H. BRADY.

Correction in Letters Patent No. 890,802.

It is hereby certified that in Letters Patent No. 890,802, granted June 16, 1908, upon the application of Charles D. Seeberger, of Yonkers, New York, for an improvement in "Elevators," an error appears in the printed specification requiring correction, as follows: In line 95, page 1, the word "expended" should read *expanded*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 7th day of July, A. D., 1908.

[SEAL.]

E. B. MOORE,
Commissioner of Patents.

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31. In a conveyer, a series of moving steps, ways on which the steps travel comprising horizontal and inclined portions and end-curves, means to connect the steps together on the horizontal and inclined portions of the ways, and means to disconnect them at the end-curves.

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