

No. 719,765.

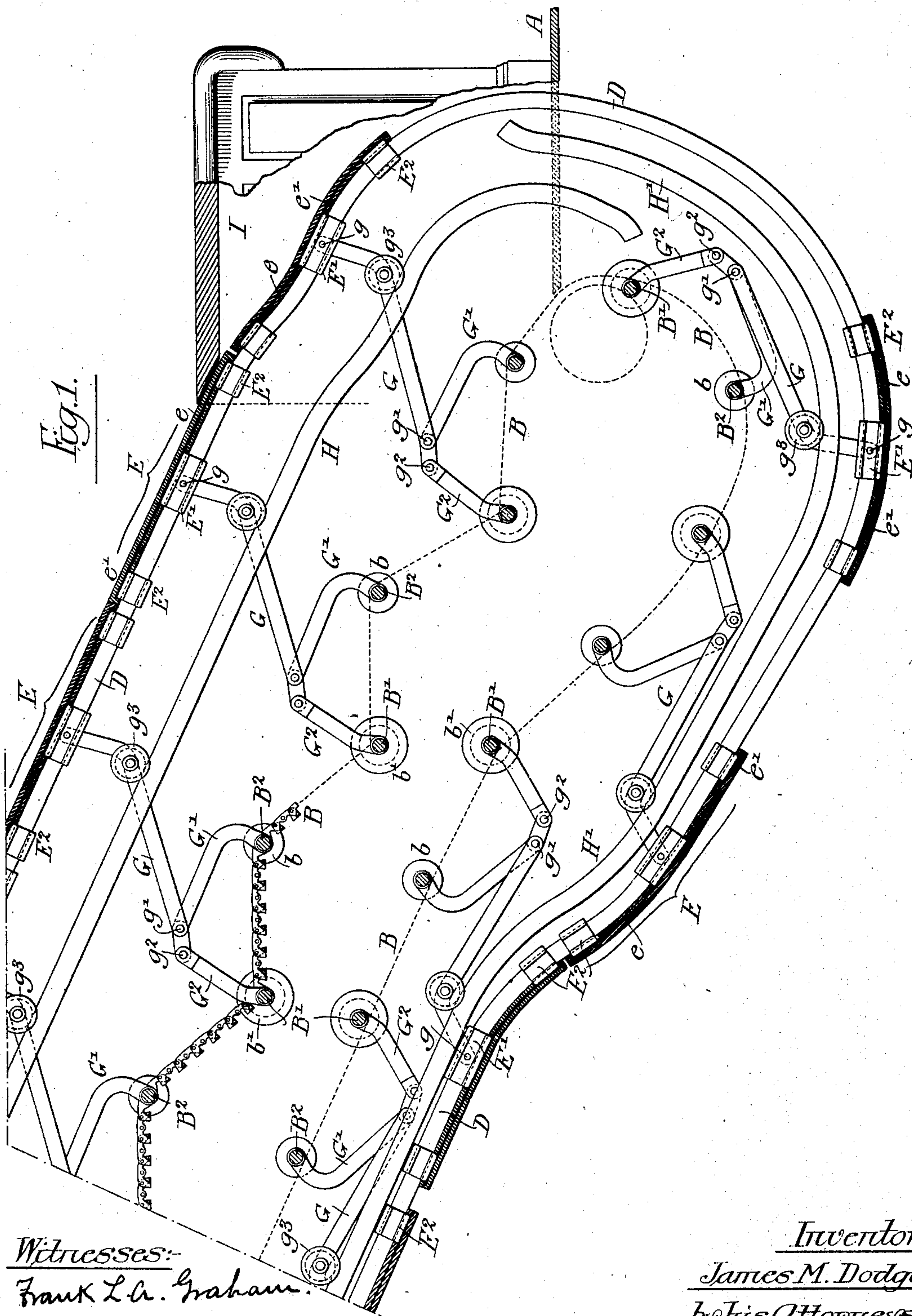
PATENTED FEB. 3, 1903.

J. M. DODGE.  
MOVING HAND RAIL.

APPLICATION FILED DEC. 4, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses:

Frank L. Graham.

Herman E. Metcalf.

Inventor:

James M. Dodge,

by his Attorneys:

Howe & Howson



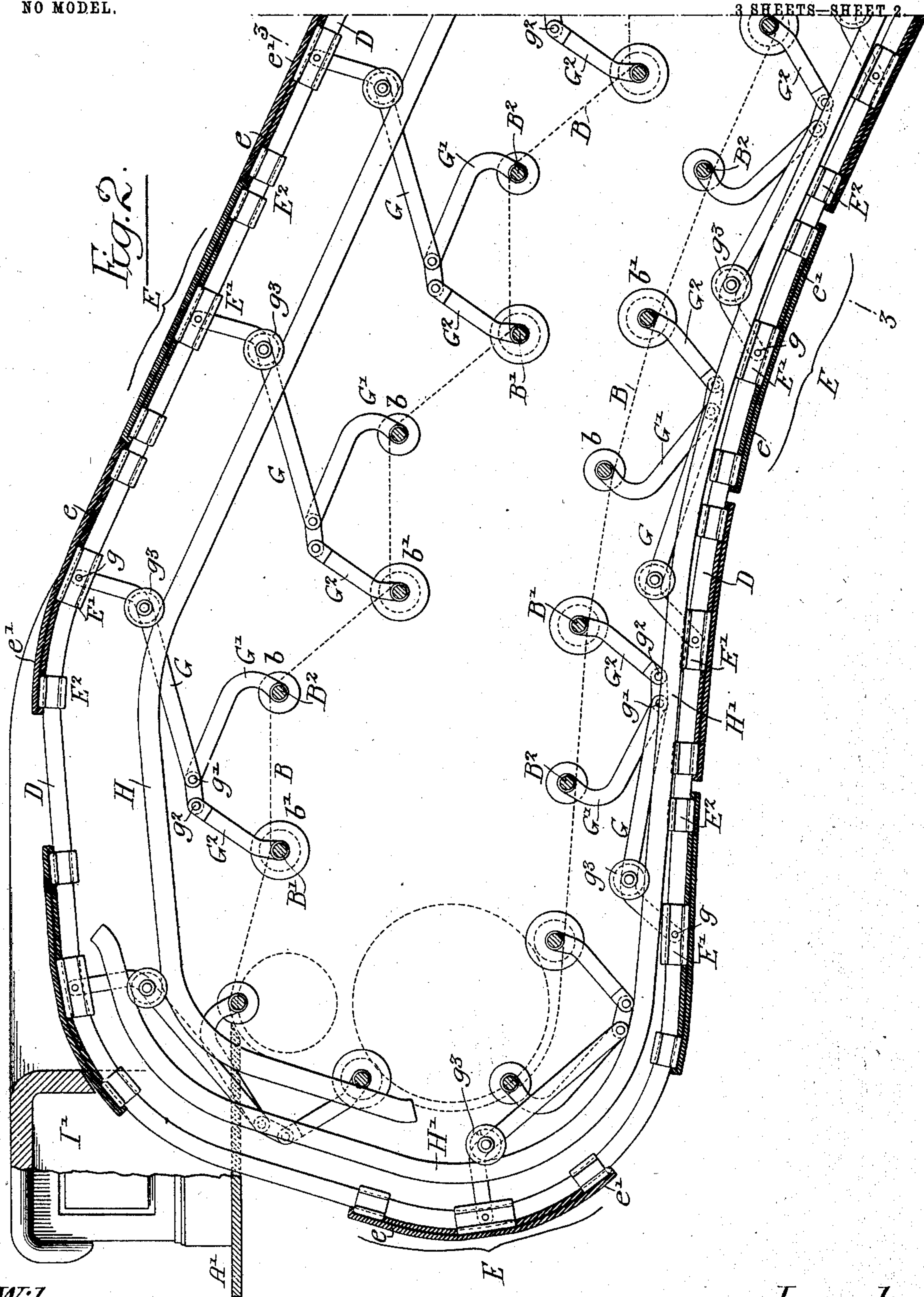
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Hanson & Hanson

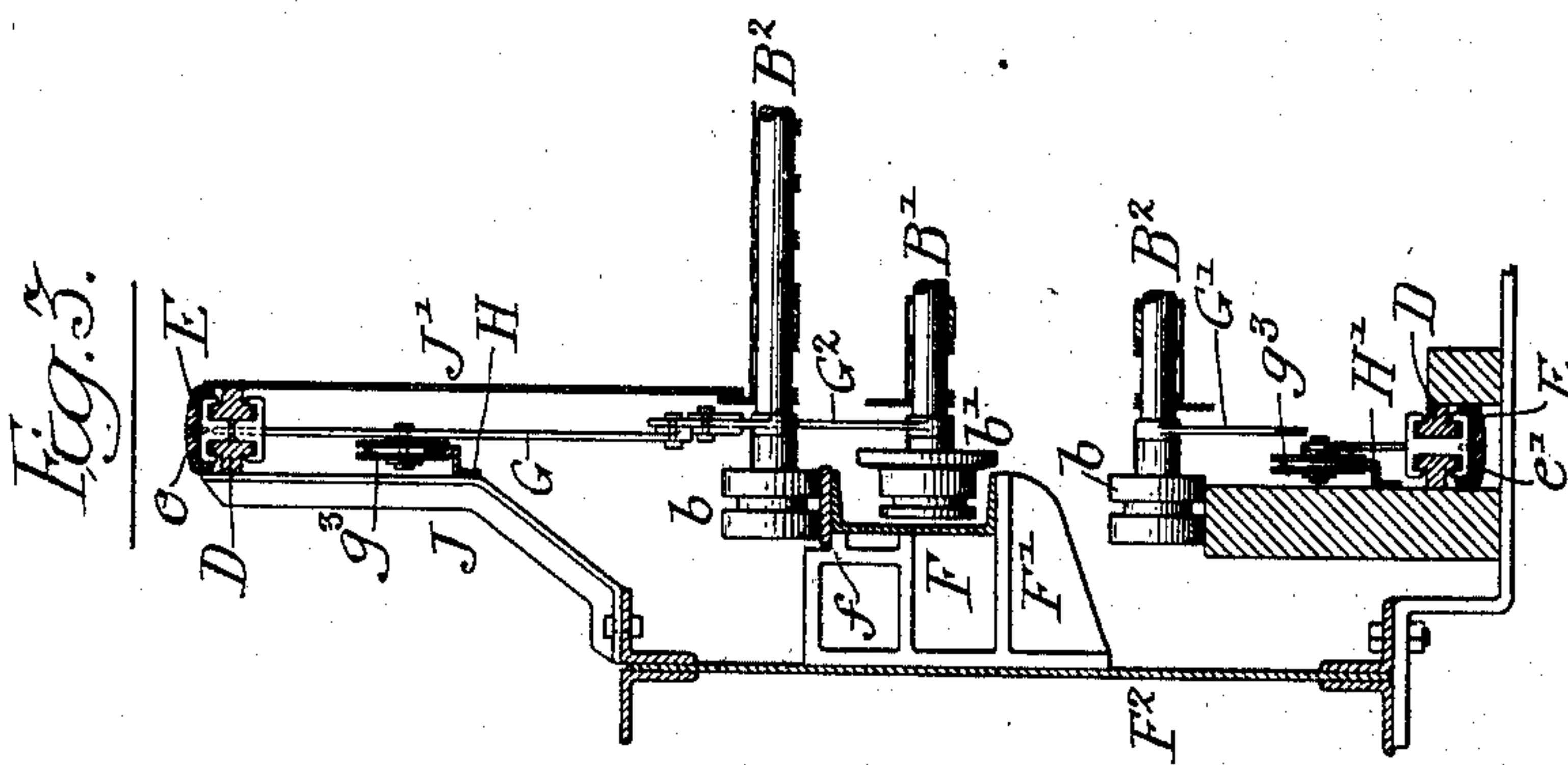
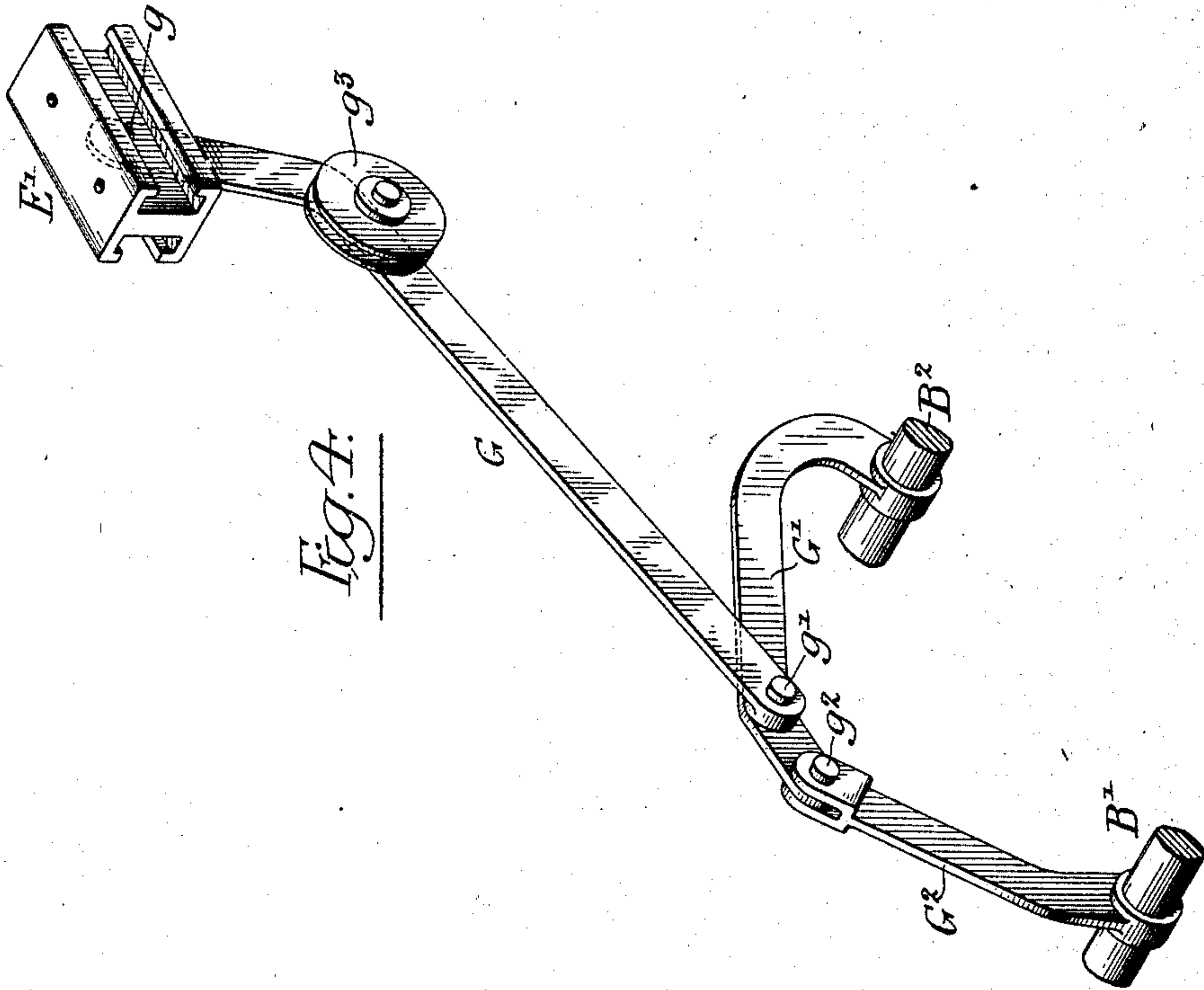
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Frank L. A. Graham;  
Herman E. Mettius

Inventor:-

James M. Dodge;  
by his Attorneys;  
Hawson & Brown



# UNITED STATES PATENT OFFICE.

JAMES M. DODGE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE STAIR LIFT COMPANY, OF CAMDEN, NEW JERSEY, A CORPORATION OF NEW JERSEY.

## MOVING HAND-RAIL.

SPECIFICATION forming part of Letters Patent No. 719,765, dated February 3, 1903.

Application filed December 4, 1902. Serial No. 133,836. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES M. DODGE, a citizen of the United States, residing at Philadelphia, Pennsylvania, have invented certain Improvements in Moving Hand-Rails, of which the following is a specification.

My invention relates to certain improvements in moving stairways or inclined planes in which there is a moving hand rail or support within reach of the person being carried by the moving portion of the stair-lift.

The object of my invention is to move the hand-rail at the same speed as the moving portion of the stair-lift, and this object I attain by connecting the hand rail or support directly to the moving portion of the stair-lift. The hand support or rail travels in an endless guide and is made up of a series of sections coupled directly to the moving portion of the stair-lift.

In the accompanying drawings, Figure 1 is a longitudinal sectional view of the base portion of a stair-lift, illustrating my invention. Fig. 2 is a longitudinal sectional view of the upper portion or head of the stair-lift. Fig. 3 is a sectional view through the hand-rail and a portion of the stair-lift on the line 3 3, Fig. 2; and Fig. 4 is a perspective view of the arms coupling the hand-support to the moving portion of the stair-lift.

A A' are the two floors, connected by the moving portion or carrier B of the stair-lift, on which are cross-shafts B' B<sup>2</sup>, having wheels b b', respectively. Both wheels travel on a rail on the return-run, and the wheels b travel on a rail f' on the carrying-run. These rails are supported by beams F, carried by brackets F' on the supporting structure F<sup>2</sup>. This construction is fully illustrated and claimed in an application for patent filed by me on the 27th day of December, 1902, Serial No. 136,815.

I have shown a portion of the carrier of the stair-lift in full lines in Fig. 1, and the balance of the stair-lift (shown in Figs. 1 and 2) I have indicated by dotted lines, as the details of the stair-lift forms no part of the present invention.

The particular type of carrying-belt shown is fully illustrated in the patent granted to me on the 12th day of December, 1899, No.

639,154, and it will be understood that my invention can be applied to other types of moving stair-lifts or may be applied to moving inclined planes without departing from my invention.

D is an endless track or guide for the hand-rail or hand-supports. Traveling on the endless track D is a series of sections E. Each of these sections in the present instance is composed of a central block E' and end blocks E<sup>2</sup> E<sup>2</sup>, which are shaped to fit the rail D, and the several blocks are connected together by a yielding metallic plate e, which is inclosed within a covering of rubber or other suitable yielding material, forming the hand support or rail. The sections are of such length and so designed that they will abut each other as they run parallel with the carrying-run of the stair-lift, but separate as they pass around either end and in some points in the return-run, as indicated in the drawings. The sections E are coupled directly to the moving portion of the stair-lift by arms connected to the cross-shafts B' B<sup>2</sup> on the carrier of the stair-lift.

G is an arm pivoted at g to the block E' and connected to an arm G' at g', and this arm is connected to the shaft B<sup>2</sup> of the stair-lift at one end, and its opposite end is connected at g<sup>2</sup> to an arm G<sup>2</sup>, which in turn is connected to the shaft B' of the stair-lift, as clearly shown in Fig. 4. On the arm G is a grooved wheel g<sup>3</sup>, which travels on rails H H'. These rails overlap each other at the upper and lower ends of the stair-lift, so as to allow the grooved wheels to readily transfer from one rail to the other.

In the present instance the rail H is directly in line with the exposed portion of the hand rail or support and runs parallel with it, so that when the stair-lift is flexed to form steps and risers of the carrying-run the sections E of the hand-rail abut one another, forming what may be termed a "continuous" endless hand-rail, as it is continuous during the portion of its travel which is exposed to be grasped by the person being conveyed; but short hand-holds spaced apart may be used in some instances.

In order to protect the ends of the hand-rail



above the floor, I mount a stationary hand rail or guard I at the lower portion and extend it to a point beyond where the sections come together, as indicated in Fig. 1, and at the upper end of the stair-lift I form another guard I', and I extend it beyond the point of separation at the upper end. One form of device I may use is simply an open guard into the channel of which the hand-rail may pass, so that the stationary guards will force the hand of the person being carried off the hand-rail in order that it will not be caught by any fixed projections.

It will be noticed that the connections between the hand-rail and the moving portion of the stair-lift are so arranged that they will be extended on the upper portion or carrying-run of the stair-lift, but will be closed in passing around the ends and on the return-run.

In the present instance I have shown two rails D D, Fig. 3, and each rail has a T-head, and the blocks E have lips and are shaped so as to overlap the T-heads of each rail. The inner rail is supported by brackets J, projecting from the frame F<sup>2</sup>, while the outer rail is supported by a plate J', forming a guard and inclosing the mechanism connecting the hand-rail with the moving portion of the stairway.

In some instances my invention may be applied to a moving sidewalk or a horizontal conveyer without departing from the invention; but it is especially applicable in connection with moving stairways having steps and risers or moving inclined planes.

In a companion application filed October 25, 1902, Serial No. 128,777, I have claimed, broadly, a moving stairway or plane having an endless carrying-section with an endless hand rail or support connected directly to the moving carrying-section, and in this application I make the following claims:

1. The combination in a moving stairway or plane, of an endless carrying-section, with a hand rail or support connected directly to the moving carrying-section, and a guide for the hand rail or support, substantially as described.

2. The combination in a moving stairway or plane, of an endless carrying-section, a series of sections forming a hand rail or support, each section being connected directly to a moving carrying-section, and guides for the said section, substantially as described.

3. The combination in a moving stairway or plane, of an endless carrying-section, a series of hand rail or support sections, each section being flexible, and means for connecting the said sections directly to the moving carrying-section, substantially as described.

4. The combination in a moving stairway or plane, of an endless carrying-section, an endless track, a hand rail or support made up of a series of sections, each section having blocks arranged to travel on the track, and arms connecting each section to the moving

portion of the stairway, substantially as described.

5. The combination in a moving stairway or plane, of an endless carrying-section, an endless track, hand-rail sections arranged to travel on the track, three arms connected together, one arm connected to the hand-rail section and the other two arms connected to the moving portion of the stair-lift, substantially as described.

6. The combination in a moving stairway or plane, of an endless carrying-section, an endless track, a series of hand-rail sections mounted on the track, each section composed of a central block and two end blocks united by a flexible connection forming the hand-rail, with arms connecting the said sections to the moving portion of the stairway, substantially as described.

7. The combination in a moving stairway or plane, of an endless carrying-section, an endless track, three arms connected together, one of said arms being connected to the moving hand-rail section and the other two arms being connected to the conveying-section, a guide-rail, and wheels on one of said arms arranged to travel on said guide-rail, substantially as described.

8. The combination in a moving stairway or plane, of an endless carrying-section, a hand-rail section connected directly to the endless carrying-section, said hand-rail section having blocks engaging a guide-track, a flexible metallic band connecting the several blocks, and a covering of flexible material forming the hand-rail proper, substantially as described.

9. The combination in a moving stairway or plane, of an endless carrying-section, an endless track for the hand-rail, said track being T-shaped, blocks having lips engaging the said track, said blocks being flexibly connected together to form a hand rail or support, and means for coupling said hand rail or support directly to the moving portion of the stairway, substantially as described.

10. The combination in a moving stairway or plane, of an endless carrying-section, an endless track for a moving hand-rail, a series of sections forming the hand-rail and arranged to travel on the track, means for imparting motion to the said sections, and guards at the upper and lower ends of the stairway or plane extending over the hand-rails so that the sections making up the hand-rail will abut and form a continuous hand-rail at the exposed portions, substantially as described.

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

JAMES M. DODGE.

Witnesses:

WILL. A. BARR,  
JOS. H. KLEIN.