

Feb. 17, 1953

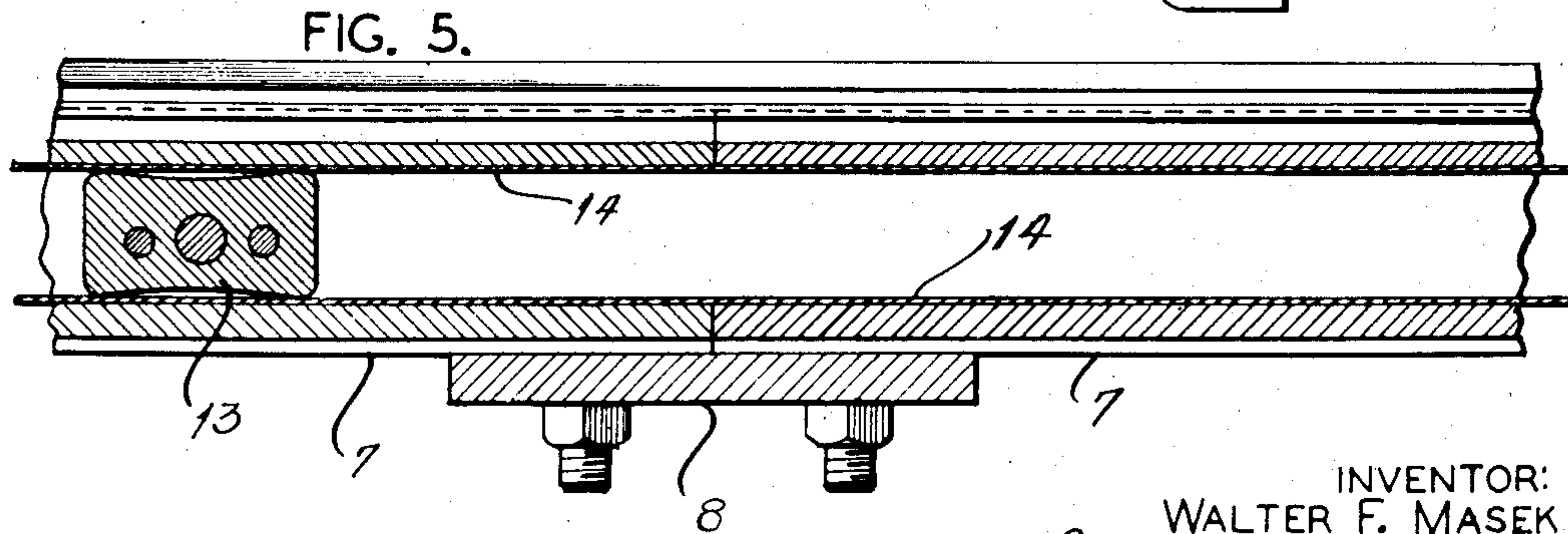
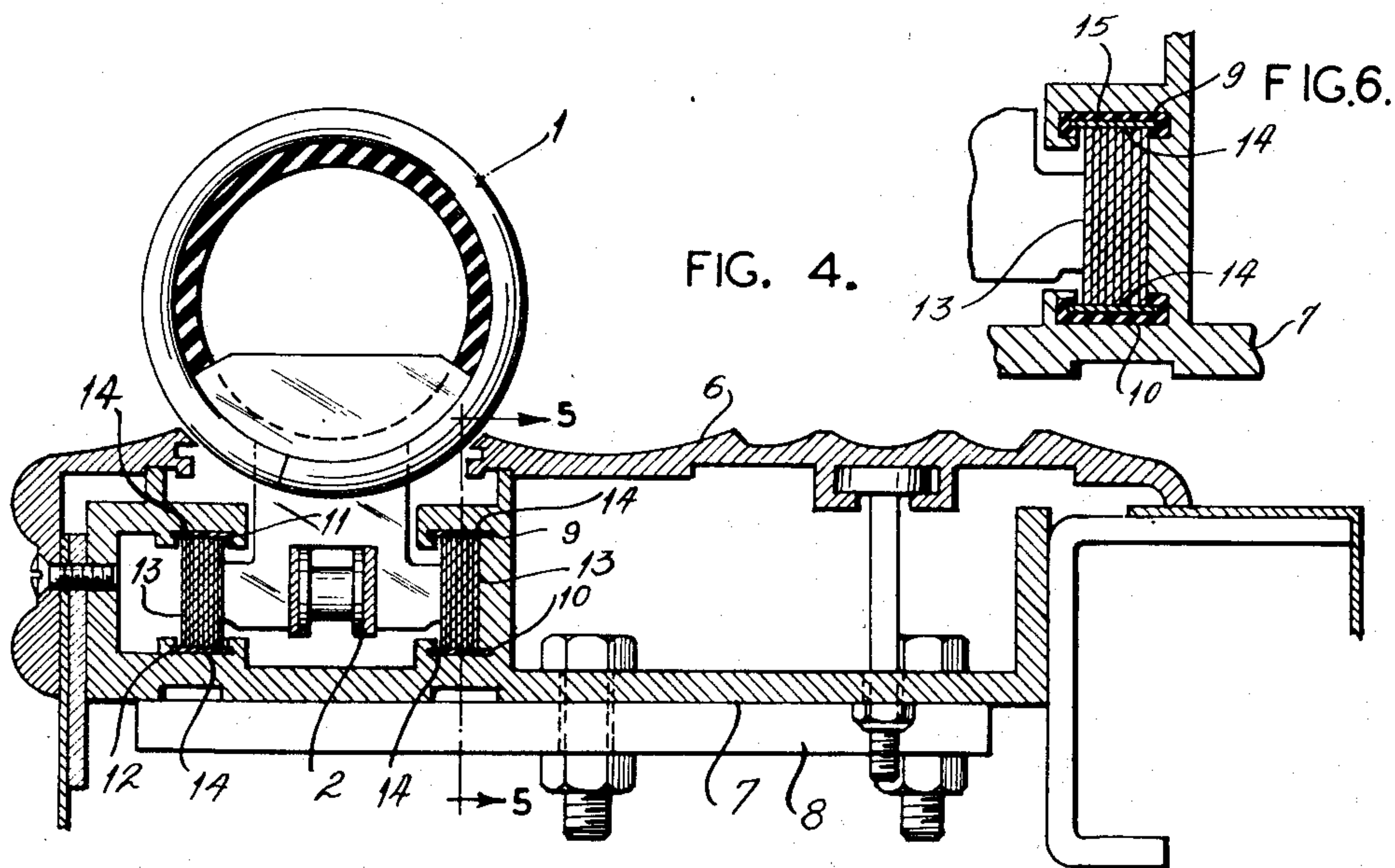
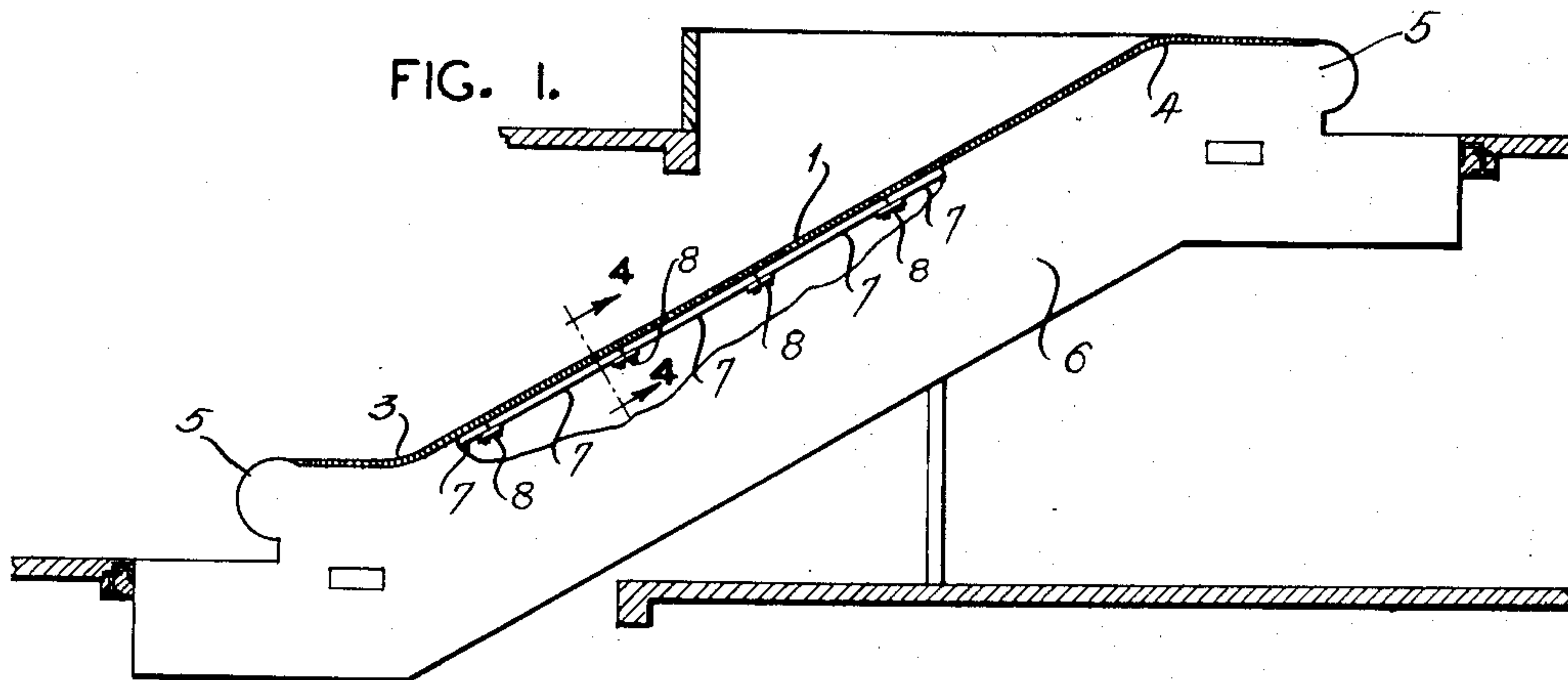
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2,628,700

HANDRAIL FOR MOVING STAIRWAYS

Filed July 6, 1950

2 SHEETS—SHEET 1



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2 SHEETS—SHEET 2

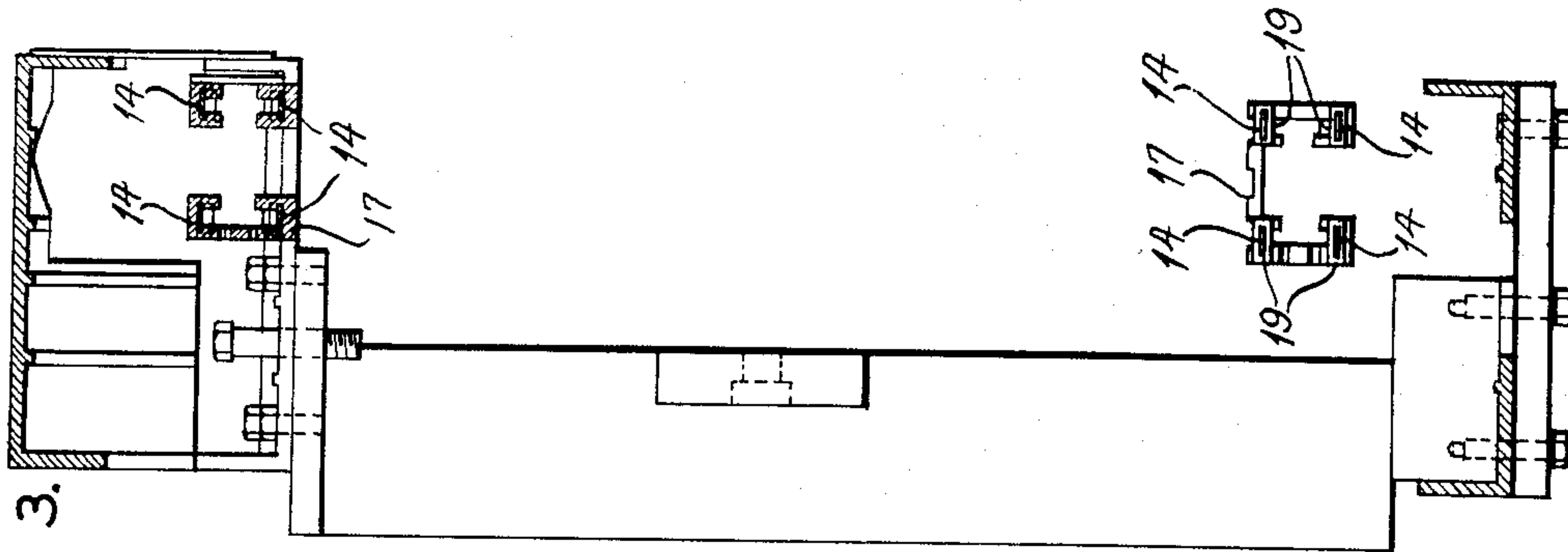


FIG. 3.

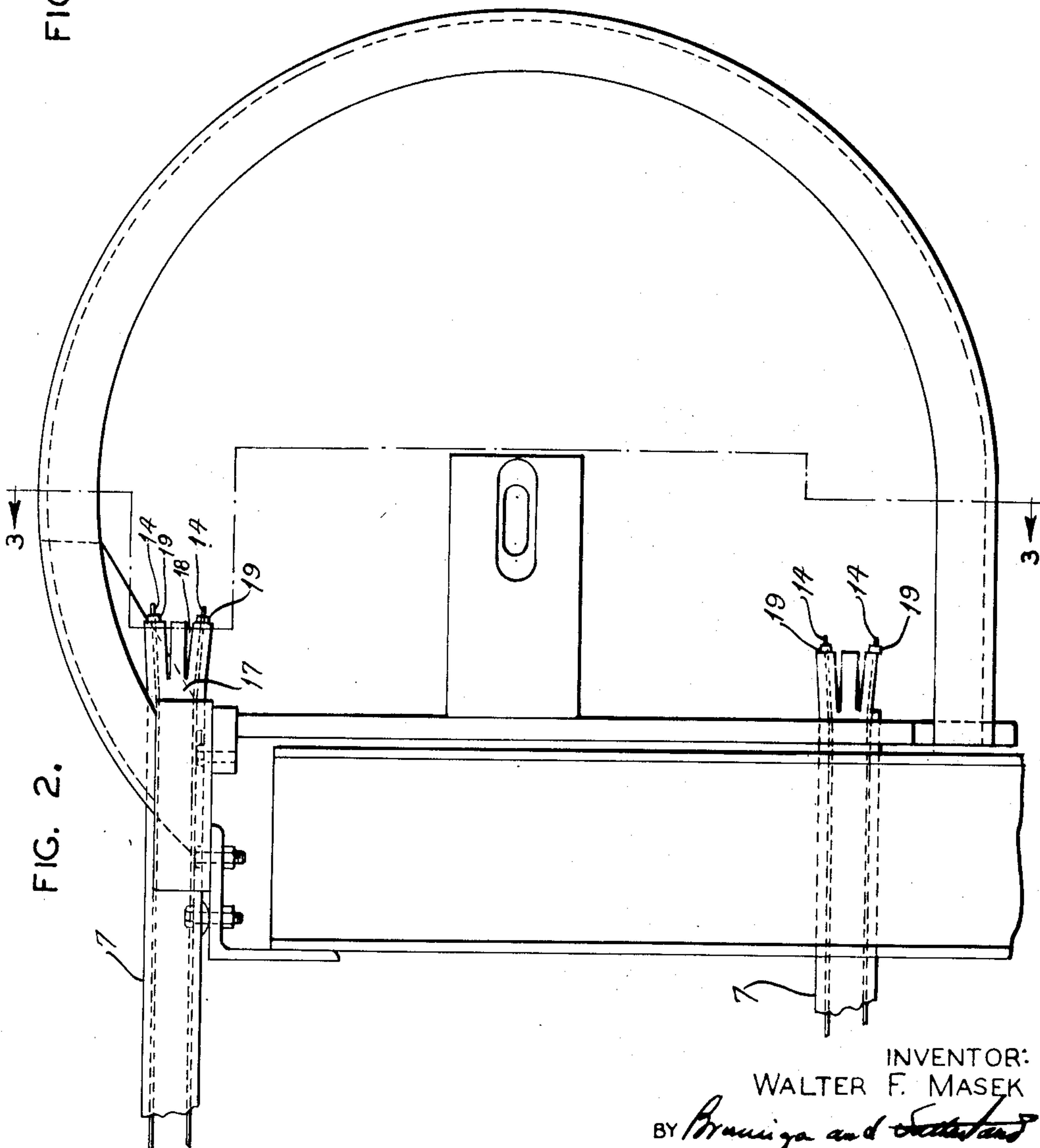


FIG. 2.

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# UNITED STATES PATENT OFFICE

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## HANDRAIL FOR MOVING STAIRWAYS

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11 Claims. (Cl. 198—16)

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This invention relates generally to moving stairways, and particularly to an apparatus for guiding the moving hand rail of such stairways.

In moving stairways of the character whose grip member (i. e., the part which is exposed to be engaged by the hand of a passenger) is stretchable, and hence cannot be subjected to tensile stress in that portion of its orbit where it is exposed for gripping, it is desirable to provide a chain drive for moving the stretchable grip member about its orbit. Such arrangements are disclosed in the copending applications of Walter F. Masek, Serial No. 663,223, filed April 18, 1946 (now Patent No. 2,545,741), and Walter F. Masek and William F. Richardson, Serial No. 73,818, filed January 31, 1949 (now Patent No. 2,578,566), of which applications this application is a continuation as to common subject-matter.

In hand rail constructions of the character above referred to, the chain, being substantially non-stretchable, is relied upon to confine the grip member of the hand rail to the proper orbit, which frequently involves changing of direction in the exposed run of the hand rail, and always involves changing of direction in the concealed run where, as is usual, the hand rail is formed as a continuous loop. In the interest of safety, it is desirable that the exposed portion of the moving hand rail travel in definitely fixed spaced relationship to the stationary parts along which it travels, and consequently the chain, which is depended upon not only to move but to guide the exposed portion of the hand rail, must be guided with precision.

In the construction of the stationary parts of the balustrade of a moving stairway, particularly those adjacent the exposed portion of the moving hand rail, it is both difficult and costly to produce parts which are integral from one end to the other of the balustrade. This difficulty is accentuated when, as is quite common, the direction of travel of the moving hand rail changes intermediate the ends of its exposed portion.

The object of the present invention, generally stated, is to provide a stationary balustrade, composed of sections joined end-to-end, and having a continuous guide surface.

Other objects of the invention will become apparent to those skilled in the art when the following description is read in connection with the accompanying drawings, in which:

Figure 1 is a view in side elevation of a moving stairway, part being broken away to reveal

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the relationship of the elements with which the present invention is concerned;

Figure 2 is an enlarged view of the terminal portions of the balustrade shown in Figure 1;

Figure 3 is a sectional view taken along line 3—3 of Figure 2;

Figure 4 is an enlarged sectional view taken along line 4—4 of Figure 1.

Figure 5 is a sectional view taken along line 5—5 of Figure 4; and

Figure 6 is a sectional detail similar to a portion of Figure 4 but showing a modification thereof.

In the accompanying drawings, the present invention is illustrated in connection with a hand rail having a grip element 1 formed of helically coiled wire, moved and guided about its orbit by a link chain 2. As shown in Figure 1, the exposed portion of the grip element 1 is required to change direction at 3 and 4, as the hand rail levels out near the upper and lower newels 5. The exposed portion of the hand rail 1 is moved along adjacent a stationary balustrade 6, which covers and protects the moving parts. While the balustrade 6 is primarily protective and ornamental, it contains certain structural parts, including the members which confine the chain 2 to a fixed orbit. The present invention is primarily concerned with such members.

In accordance with the present invention, generally stated, the components of a balustrade which are utilized to confine the hand rail to a fixed orbit are constructed of sections joined end-to-end, some being curved, others rectilinear. The present invention contemplates that said sections be provided with a track member which is continuous from end-to-end of the composite structure resulting when the aforesaid sections are joined end-to-end. The invention particularly contemplates that said sections be formed of extruded metal which, in the process of extrusion, are provided with slots adapted to receive a thin metallic tape, which may be threaded through said slots after the sections are joined end-to-end, thus bridging the joints between the sections and providing an uninterrupted track for guiding the drive chain.

As shown in the drawings, the balustrade includes a plurality of sections 7 of extruded metal, shaped as shown particularly in Figure 4. These sections are connected together end-to-end by splice plates 8, so as to form a composite member extending between the newels 5.

The cross-section of the section 7 is designed to provide a series of slots 9, 10, 11, and 12, the



lateral extremities of each of which are overhung by the metal of the section. Between the slots 9 and 10, and likewise between the slots 11 and 12, a substantial vertically extending open space is provided, so that together the slots 9 and 10, and their intervening open space, constitute an I-shaped slot, or two T-shaped slots, the one being right side up, the other upside down.

After the several sections 7 are joined end-to-end and secured together, the slots 9, 10, 11 and 12 of the several sections will be in substantial alignment, although at the joint between the sections there may be, and usually is, a slight irregularity which may obstruct smooth sliding movement of a member thereacross, or unduly wear a member sliding thereacross. Such a sliding member is intended to operate in the space between the slots 9 and 10, and in the space between the slots 11 and 12. The sliding member may take the form of a block 13, preferably formed of thermo-setting plastic composition and connected to the drive chain 2, as disclosed with greater particularity in the co-pending application Serial No. 73,818, above mentioned.

In order to provide a smooth, regular, uninterrupted track upon which the blocks 13 may slide without undue wearing, strips of tape 14 are threaded through the respective slots 9, 10, 11 and 12 from one end of the composite guide to the other. The strips 14 may be steel tape, having a thickness on the order of about one thirty-second of an inch, and a width corresponding substantially to the width of the slots 9, 10, 11 and 12, or at least wide enough that the strip cannot escape the overhanging portions of the metal about the slot. The depth of the slots 9, 10, 11 and 12 is correlated with the thickness of the tape, so that the latter may be freely threaded through the slots after the several sections 7-7 are connected end-to-end. In order to facilitate the passage of the tape 14 through the slots after the sections are joined together, it is frequently desirable to round the slots at the ends of the several sections 7-7, thus to obviate the possibility that the end of the tape, in the process of threading through, may strike the end of a slightly misaligned section.

After the tape is threaded through the slots as aforesaid, it constitutes a continuous floor, or ceiling, against which the blocks 13 may slide freely. In order to prevent endwise creepage of the tape 14 within the slots after being once positioned, any suitable anchorage may be provided at the end of the tape, as shown particularly in Figures 2 and 3, but, except for the anchorages at the ends, the tape is not mechanically connected to the sections 7 intermediate the run thereof save by the overhanging metal about the slots 9, 10, 11 and 12.

At the ends of the sections 7 which join the newels 5, a part of the cross-section of the section 7 is cut away to permit attachment of the newel structure, so that the endmost portion 17 of the section 7 appears as shown in Figure 3. Furthermore, it is desirable to slit the extreme end of the portion 17 as shown at 18, so that the slot 9 may be flared away from the slot 10, and likewise the slot 11 from the slot 12. Such flaring of the ends of the sections 7 at the newels assures that the slide blocks 13 will be funneled into their guideways after having passed about the turn within the newel. As clearly shown in Figure 2, the tapes 14 extend slightly beyond the ends of the sections 7, and the extended portions thereof may be provided with a suitable anchor-

age 19, which may be the conventional clip utilized largely in packaging operations where the packages are bound with steel straps, one form being familiarly known as the Signode clip.

A modification of the slots 9 and 10 is shown in Figure 6 with the addition of slot-liner members 15 which are preferably formed of a suitable sound deadening material, and which is preformed to fit within the slots 9 and 10. It will be noted also that a tape-receiving channel or slot is formed in each of the liner members and provides for the reception of the tapes 14 therein. The slot-liners provide means insulating the tapes from direct contact with the slots 9 and 10 and reduce the noise which would be present if the tapes were in direct contact with the slots.

From the foregoing description, those skilled in the art should readily understand that the invention accomplishes its objects, and enables the fabrication of the stationary guide for a moving hand rail of sections joined end-to-end, but nonetheless providing uninterrupted guiding surfaces along which the guide blocks may slide from end-to-end of the exposed run of the hand rail. By providing slots and tapes as herein specifically disclosed, it is unnecessary to mechanically connect the tape or track member to its supporting member in a manner which would present an irregularity, or rough portion, in the track, and consequently the life of the guide blocks is thereby greatly prolonged.

While one complete embodiment of the invention has been disclosed in detail, it is not to be understood that the invention is limited to that embodiment. On the contrary, it is realized that many modifications and variations will present themselves to those skilled in the art without departing from the spirit of this invention, and it is therefore contemplated that such modifications and variations be within the scope of the appended claims.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

1. In a moving stairway having a moving hand rail provided with guide shoes in spaced relationship lengthwise thereof, a stationary guide for said guide shoes composed of sections joined end-to-end, the combination of a strip of tape extending from end-to-end of the composite stationary guide bridging the joints between the sections thereof and constituting a continuous track for said guide shoes.

2. The combination of claim 1 wherein the sections of guide are formed with a T-slot, the strip of tape is disposed in the crossbar portion of the T-slot, and blocks on the moving hand rail disposed in the upright portion of the T-slot for sliding movement against the surface of the tape.

3. The combination of claim 1 wherein the sections of guide are formed with I-slots on opposite sides of the hand rail, a strip of tape is disposed in the crossbar portions of each of the I-slots, and blocks on the moving hand rail disposed in the upright portion of the I-slot for sliding movement against the surface of the tape.

4. In a moving stairway having a moving hand rail mounted on and driven by an endless chain, guide shoes carried by the chain at intervals along its length, a stationary guide composed of sections joined end-to-end, said sections having an internal cavity shaped to accommodate said guide shoes, and a strip of tape extending



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through said cavity continuously from end-to-end of the guide and providing a track for said shoes.

5. The combination of claim 4 wherein the cavity has a laterally extending slot at the floor level thereof, said slot having a height corresponding substantially to the thickness of said tape, and said strip of tape is seated in said slots.

6. The combination of claim 4 wherein the cavity has a laterally extending slot at the floor level thereof, said slot having a height corresponding substantially to the thickness of said tape, and said strip of tape is seated in said slots and anchored at its ends against longitudinal movement relative to said cavity but intermediate its ends being free of anchorage to said sections save by engagement with said slot.

7. An escalator hand rail structure, comprising a hand rail element including a series of elementary convolutions held in closely spaced substantially parallel relation by flexible means, slide shoes connected to support said element at intervals therealong, a supporting rail along which said shoes travel, and a ribbon extending along said rail to provide a contact surface for said shoes.

8. An escalator hand rail structure, comprising a hand rail element including a series of elementary convolutions held in closely spaced substantially parallel relation by flexible means,

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slide shoes of synthetic plastic material connected to support said element at intervals therealong, a supporting rail along which said shoes travel, and a metallic ribbon extending along said rail to provide a contact surface of said shoes.

9. In a moving stairway, a moving hand rail, a stationary guide for the hand rail composed of like sections joined end-to-end, slots formed longitudinally of the guide sections, a continuous strip of tape in said slots and reaching from end-to-end of the joined-together guide sections to provide a continuous track through said stationary guide.

10. The combination of claim 1 wherein the tape is separated from the stationary guide by sound-deadening material.

11. The combination of claim 9 wherein said strip is secured against lengthwise movement relative to said guide by means located at the end of said guide.

WALTER F. MASEK.

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The following references are of record in the file of this patent:

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