

No. 803,117.

PATENTED OCT. 31, 1905.

C. A. LINDSTRÖM.
FLUSH DROP DOOR FOR CARS.
APPLICATION FILED JUNE 4, 1903.

3 SHEETS—SHEET 1.

Fig. 1.

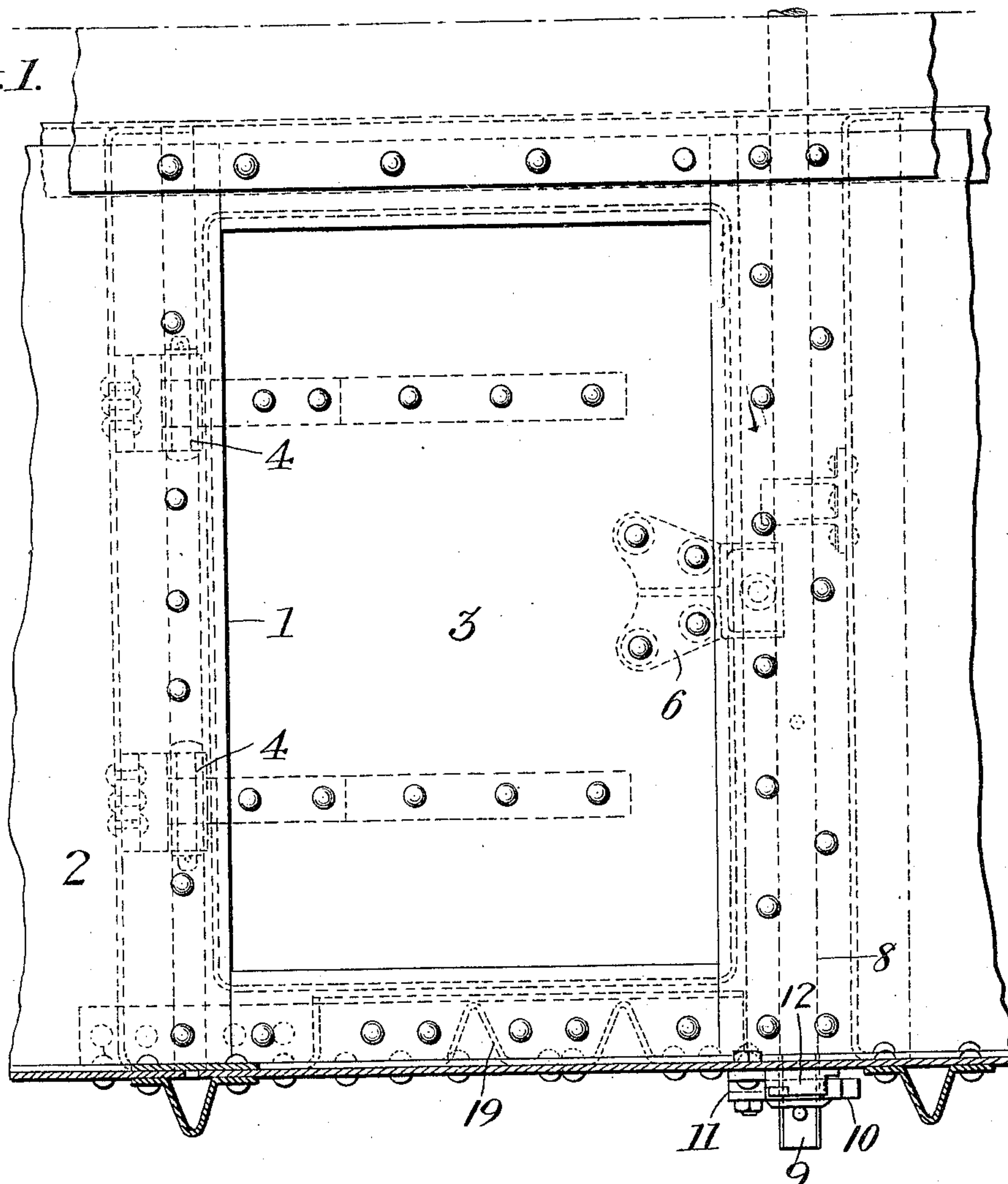
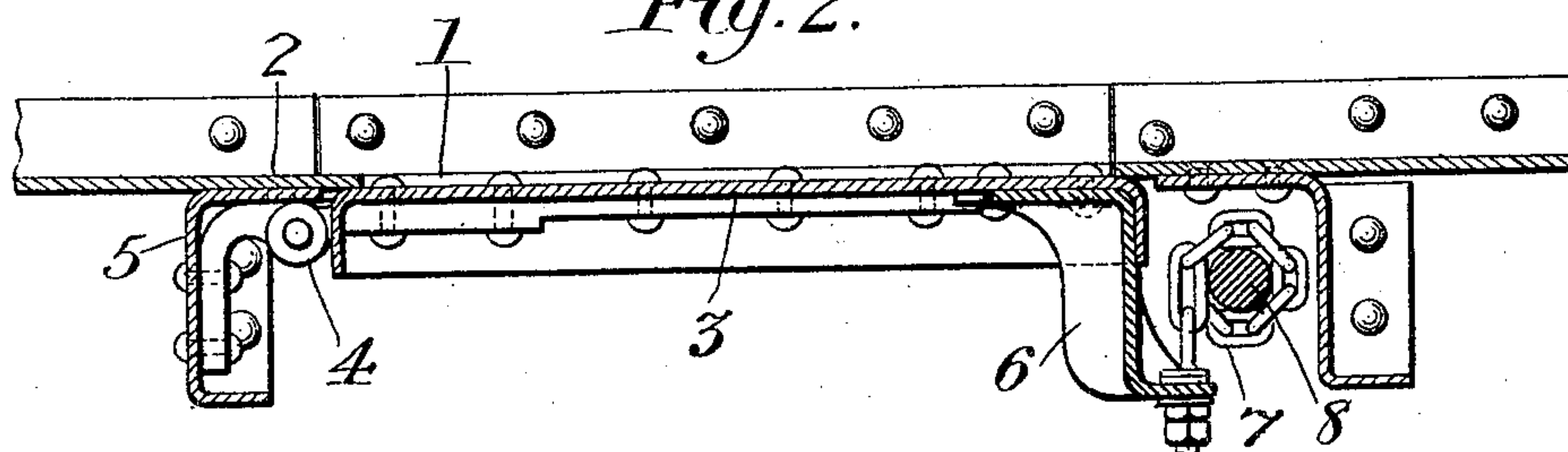


Fig. 2.



Witnesses:

O. W. Edlin.

Ada C. Briggs

Inventor:

Charles A. Lindström

by Wm. A. Finckel

Atty.

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3 SHEETS—SHEET 2.

Fig. 3.

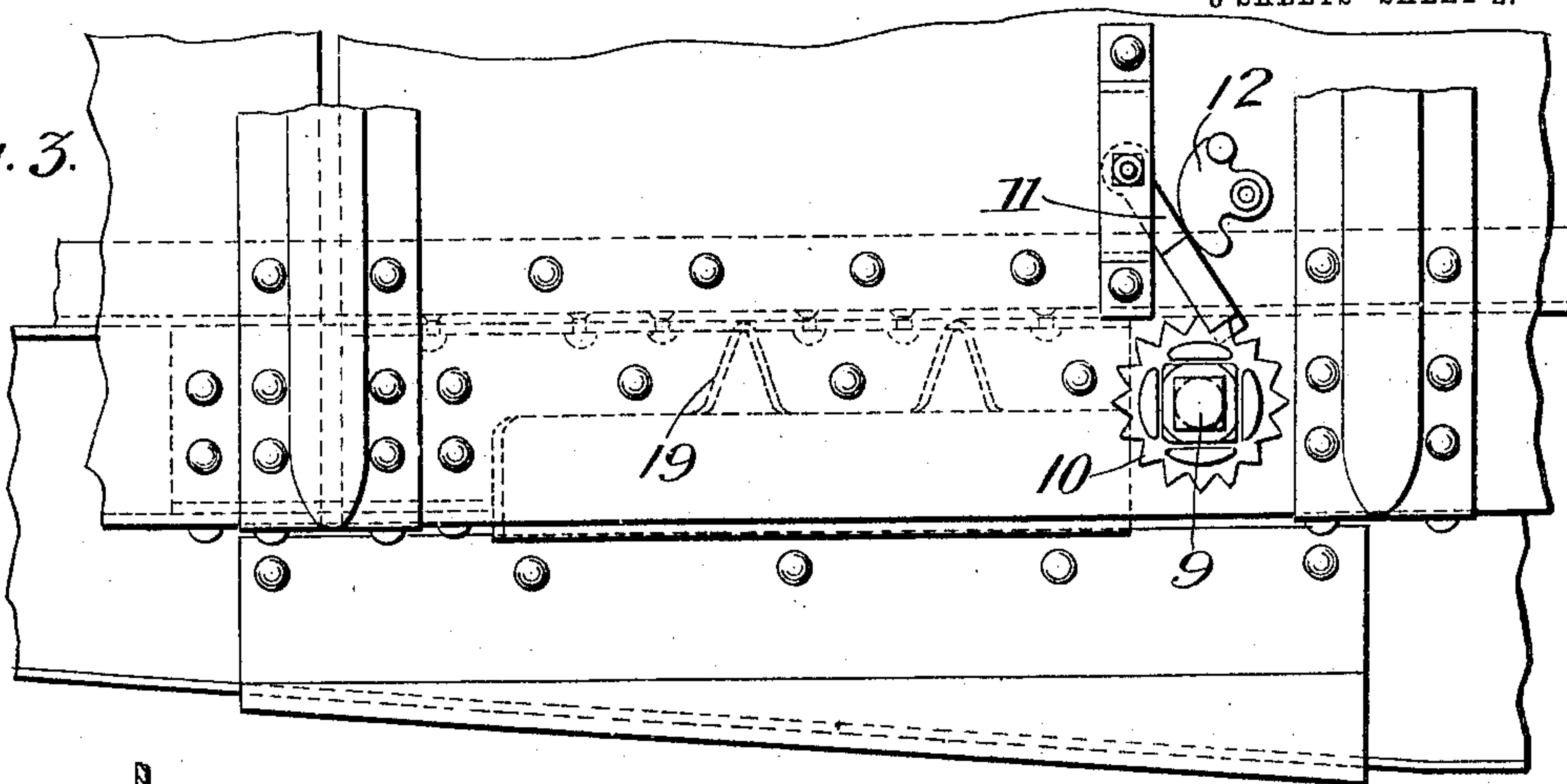


Fig. 4.

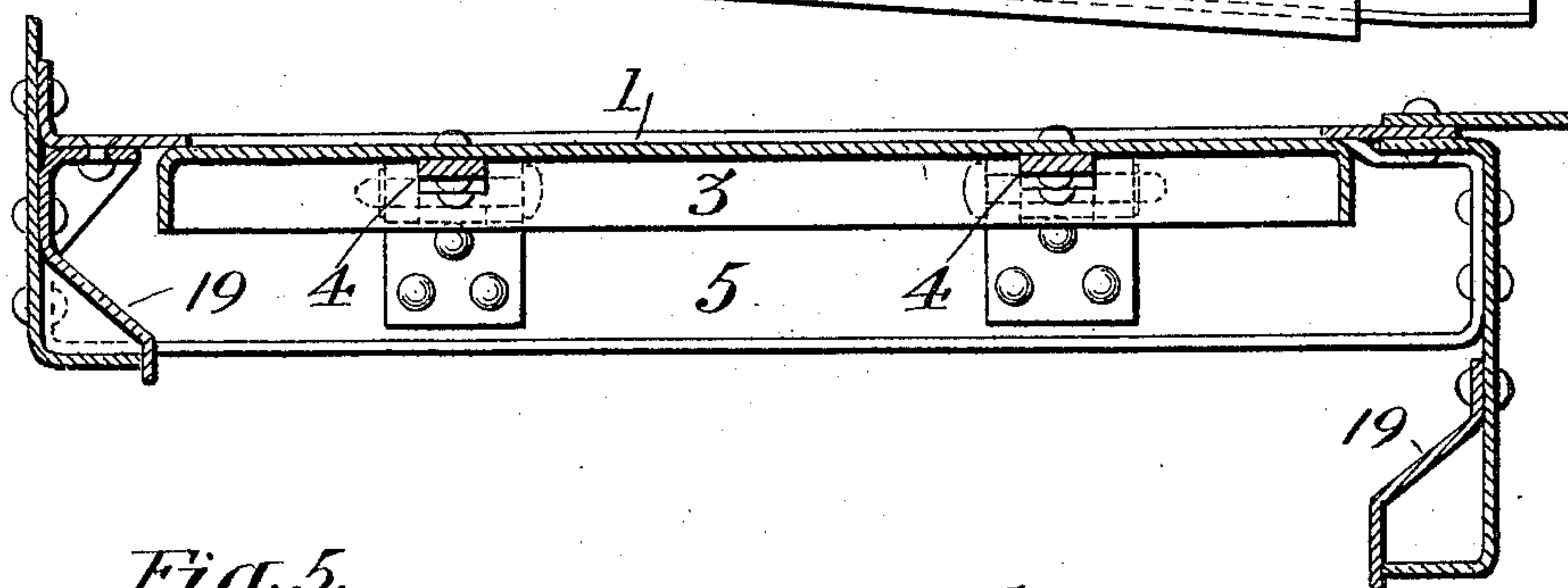


Fig. 5.

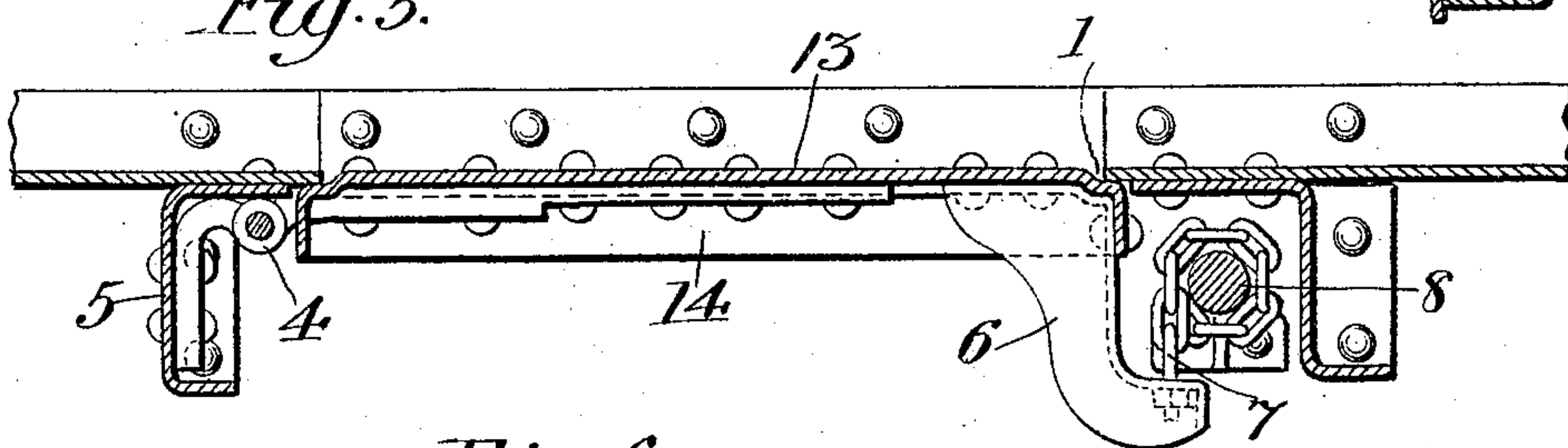
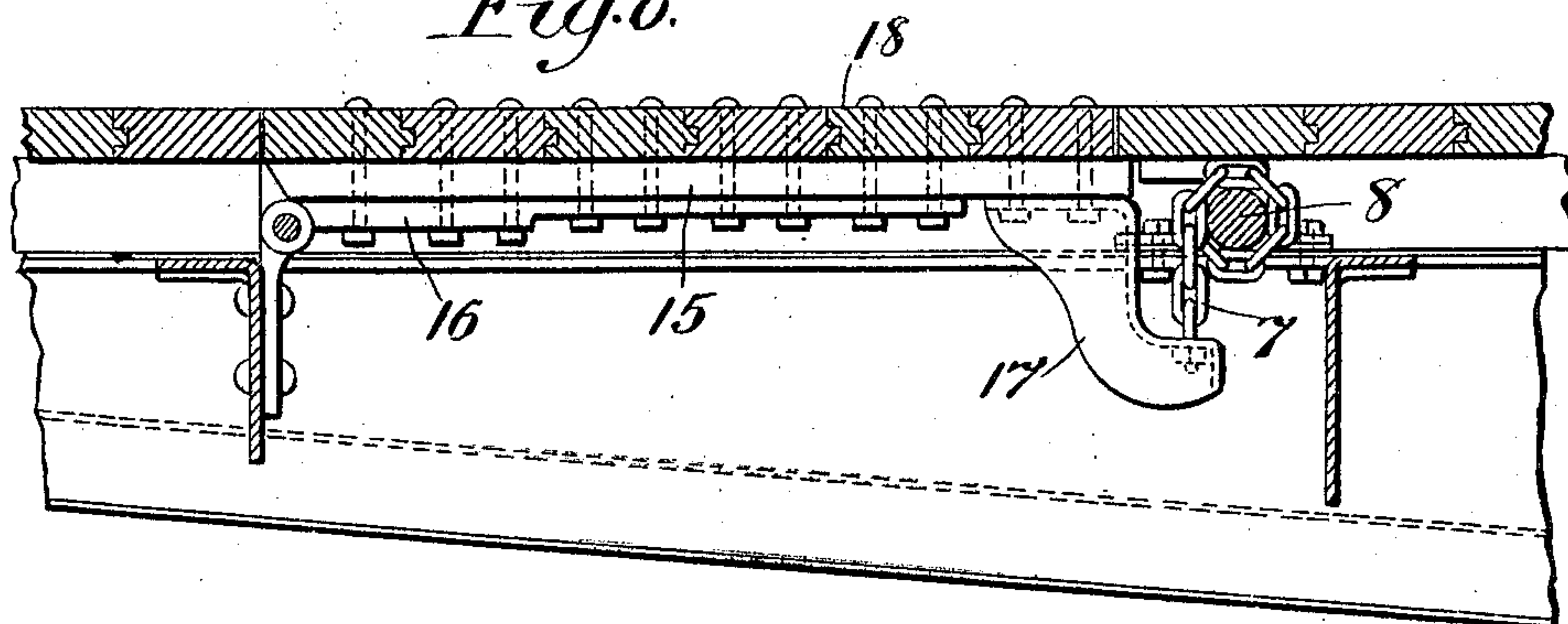


Fig. 6.



Witnesses:

A. W. Edlin.
Ada C. Briggs.

Inventor:

Charles A. Lindström
by W. H. Finckel Atty.

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3 SHEETS—SHEET 3.

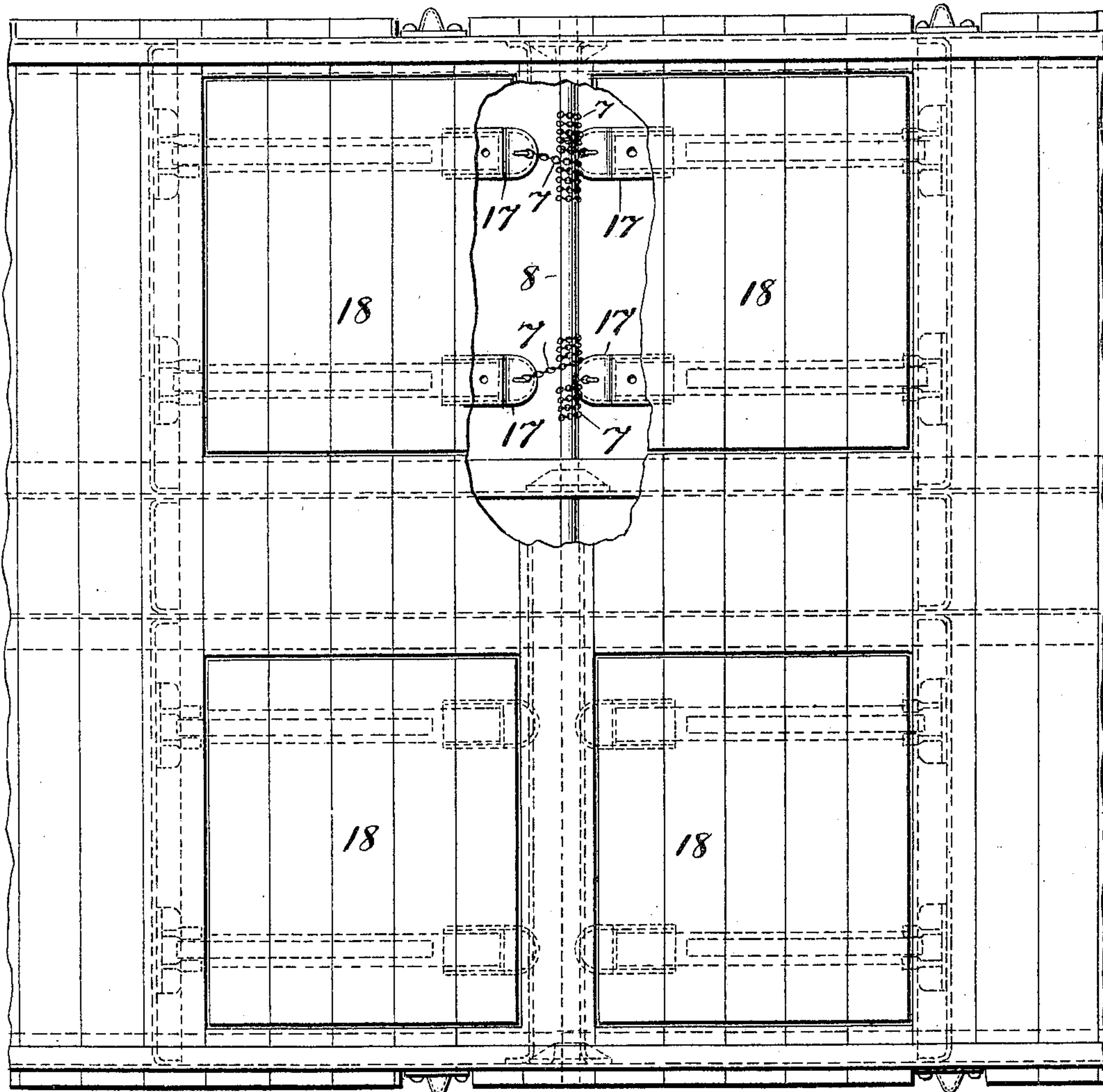


Fig. 7.

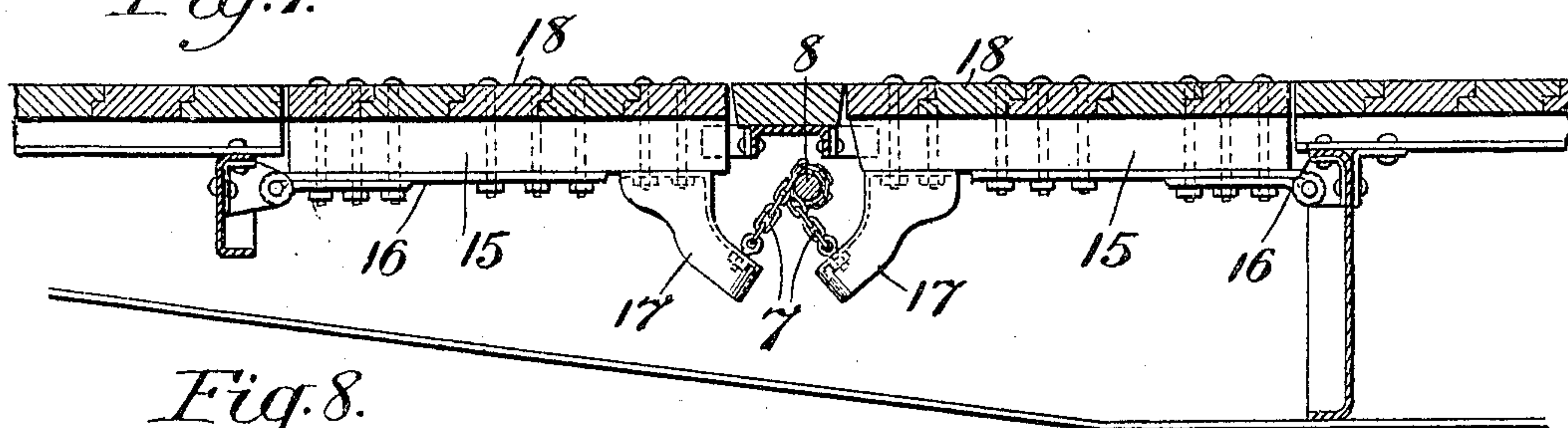


Fig. 8.

Witnesses:

O. W. Edlin.
Ada C. Briggs.

Inventor:

Charles A. Lindström
by W. H. Finckel
Atty

UNITED STATES PATENT OFFICE.

CHARLES A. LINDSTRÖM, OF ALLEGHENY, PENNSYLVANIA, ASSIGNOR TO
PRESSED STEEL CAR COMPANY, OF PITTSBURG, PENNSYLVANIA, A
CORPORATION OF NEW JERSEY.

FLUSH DROP-DOOR FOR CARS.

No. 803,117.

Specification of Letters Patent.

Patented Oct. 31, 1905.

Application filed June 4, 1903. Serial No. 160,079.

To all whom it may concern:

Be it known that I, CHARLES A. LINDSTRÖM, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in Flush Drop-Doors for Cars, of which the following is a full, clear, and exact description.

The object of this invention is to provide steel and wooden freight-cars with drop-doors which close flush with the floors, so that the load may be dumped or shoveled out with equal facility.

The invention consists of a car having any number of doors arranged singly or in pairs in its bottom adapted to open lengthwise of the car and to close flush with the bottom or floor of the car, combined with transverse winding-shafts arranged close beneath the car-floor and near the doors and connected directly by chains with extension-brackets on the doors and means directly to lock the shafts in given position.

In the accompanying drawings, illustrating the invention, in the several figures of which like parts are similarly designated, Figure 1 is a top plan view of sufficient of a car to show the application of one form of the invention. Fig. 2 is a central section taken longitudinally of the car. Fig. 3 is a side view, and Fig. 4 is a transverse section. Figs. 5 and 6 are central longitudinal sections of two other forms of the invention. Fig. 7 is a top plan view of another form of the invention, showing pairs of doors arranged in series across the width of the car; and Fig. 8 is a longitudinal section thereof.

Referring to Figs. 1, 2, 3, 4, and 5, the invention is shown as applied to a steel car having no side sills and with doorways 1, made in the floor 2 to be closed by doors 3. These doors, as shown in Figs. 1 to 4, are pressed-steel rim-flanged shapes provided with hinges 4, secured to transoms or other supports 5, which may form parts of the underframe, the hinges being applied to permit the doors to swing or open downwardly in the direction of the length of the car. Each door is provided with one or more brackets 6, affixed, as by rivets, to its front edge and projecting below and in advance of it and connected directly by a chain 7 with a winding-shaft 8, arranged close beneath the floor and trans-

versely of the car in suitable bearings. By reason of the construction and arrangement of the brackets they are herein designated "extension-brackets." As shown in Figs. 1 and 3, the shaft 8 projects beyond the side of the car, has a squared end 9 to receive an operating-wrench, also a ratchet 10 to receive a locking-pawl 11, and a gravity-dog 12 to hold the pawl in engagement with the ratchet against accidental displacement. By means of the winding-shaft and its connection with the door the latter may be opened and closed. As seen in Figs. 2 and 4, this form of door is flush with the bottom of the flooring; but, as shown in Fig. 5, the center 13 of the door 14 may be embossed, so as to raise its surface to the level of the top of the floor.

For cars having wooden floors the doors may be built up upon battens 15, to which the hinges 16, bracket 17, and planks 18 are bolted or otherwise secured, and in this case the door-planks are flush with the upper level of the floor-planks. Such or similar doors may be arranged in pairs to open away from each other, as shown in Figs. 7 and 8, and four doors, or two pairs of doors, may be arranged to be operated by a single transversely-arranged shaft. It is also within my invention to arrange the metal doors in pairs in like manner.

As already stated, one or more brackets and chains may be applied to each door, and in Figs. 1 to 6 the single bracket and chain are shown, while in Figs. 7 and 8 two brackets and chains for each door are shown, part of opposite doors being broken away in Fig. 7 to expose the brackets, shaft, and chains beneath.

Where the underframe has metal parts with inturned flanges—such as center sills, sides, or side sills—such parts are provided with deflection-plates 19, riveted to them to prevent the lading being dumped from lodging on such flanges.

In all of the forms of flush drop-doors herein described it will be observed that the winding-shafts are arranged close up beneath the floor of the car, so as to be fully protected from accident, and that the connecting-brackets are so shaped and arranged as to provide for a ready and direct connection of their chains with said shafts without the intervention of pulleys or other indirect connecting

mediums, thus effecting considerable economy in manufacturing and at the same time presenting a very efficient, durable, and simple construction. The brackets have their lower ends, to which the chains are attached, located below the shafts and projected toward the vertical plane of the shafts, so that the chains extend from the shafts to the brackets in vertical or nearly vertical lines when the doors are closed, and hence there is no need of independent door-locking means.

The invention is susceptible of a longitudinal as well as a transverse arrangement in a car.

It will be understood that the constructions herein set forth are particularly applicable to flat-bottom cars without hoppers, designed for carrying coal and similar freight, where it is necessary at times to shovel out the load. The flush doors offer no obstructions to such shoveling and there are no cavities from which the load is to be dug. Combined with these desirable features is the facility of dumping the load.

What I claim is—

1. In a car, a hinged drop-door adapted to close flush in the bottom of the car, a winding-shaft arranged close to the bottom near the front edge of the door, said door having a projection extending beyond the front edge of the door toward the winding-shaft, and a chain applied directly to said projection and shaft, and serving to close the door and hold it closed.

2. In a car, a hinged drop-door adapted to close flush in the bottom of the car, a winding-shaft arranged close to the bottom near the front edge of the door, said door having a projection extending beyond the front edge of the door toward the winding-shaft, and a chain applied directly to said projection and shaft, and serving to close the door and hold it closed, combined with means to lock the winding-shaft.

3. A car, having a hinged drop-door of pressed steel, the center of which is raised to fit within the door-opening flush with the floor-level, and means to actuate said door.

4. A car, having hinged drop-doors arranged in pairs, and adapted to close the doorways flush with the floor-level, said doors having projections extending beyond their front

edges toward the winding-shaft, a winding-shaft arranged next the free ends of the doors and immediately beneath the floor, and chains directly connecting the projections and shafts.

5. A car, having hinged drop-doors arranged in pairs, and opening downwardly away from each other, and adapted to close the doorways flush with the floor-level, said doors having projections extending beyond their front edges toward the winding-shaft, a winding-shaft between the free ends of the doors and immediately beneath the floor, and chains directly connecting the projections and shaft.

6. A car, having a number of doors arranged in its bottom and adapted to open lengthwise of the car and to close flush with the bottom or floor, combined with winding-shafts arranged transversely beneath and close to the floor and near the free edges of the doors, said doors having projections extending beyond their front edges toward the winding-shafts, and chains connecting said winding-shafts and projections.

7. A car, having a number of doors arranged in its bottom and adapted to open lengthwise of the car and to close flush with the bottom or floor of the car, combined with transverse winding-shafts arranged close beneath the car-floor and near the free edges of the doors, said doors having projections extending beyond their front edges toward the winding-shafts, chains directly connecting the winding-shafts and projections, and means to lock the winding-shafts in given position.

8. In a car, a hinged drop-door adapted to close flush in the bottom of the car, a winding-shaft arranged below the level of the car-bottom and near the front edge of the door, said door having a projection extending below the plane of the winding-shaft when the door is closed and a chain applied directly to said projection and shaft and extending substantially vertically from the projection to the shaft when the door is closed.

In testimony whereof I have hereunto set my hand this 3d day of June, A. D. 1903.

CHARLES A. LINDSTRÖM.

Witnesses:

E. E. FORGENS,
J. C. LANGFITT.