

No. 674,033.

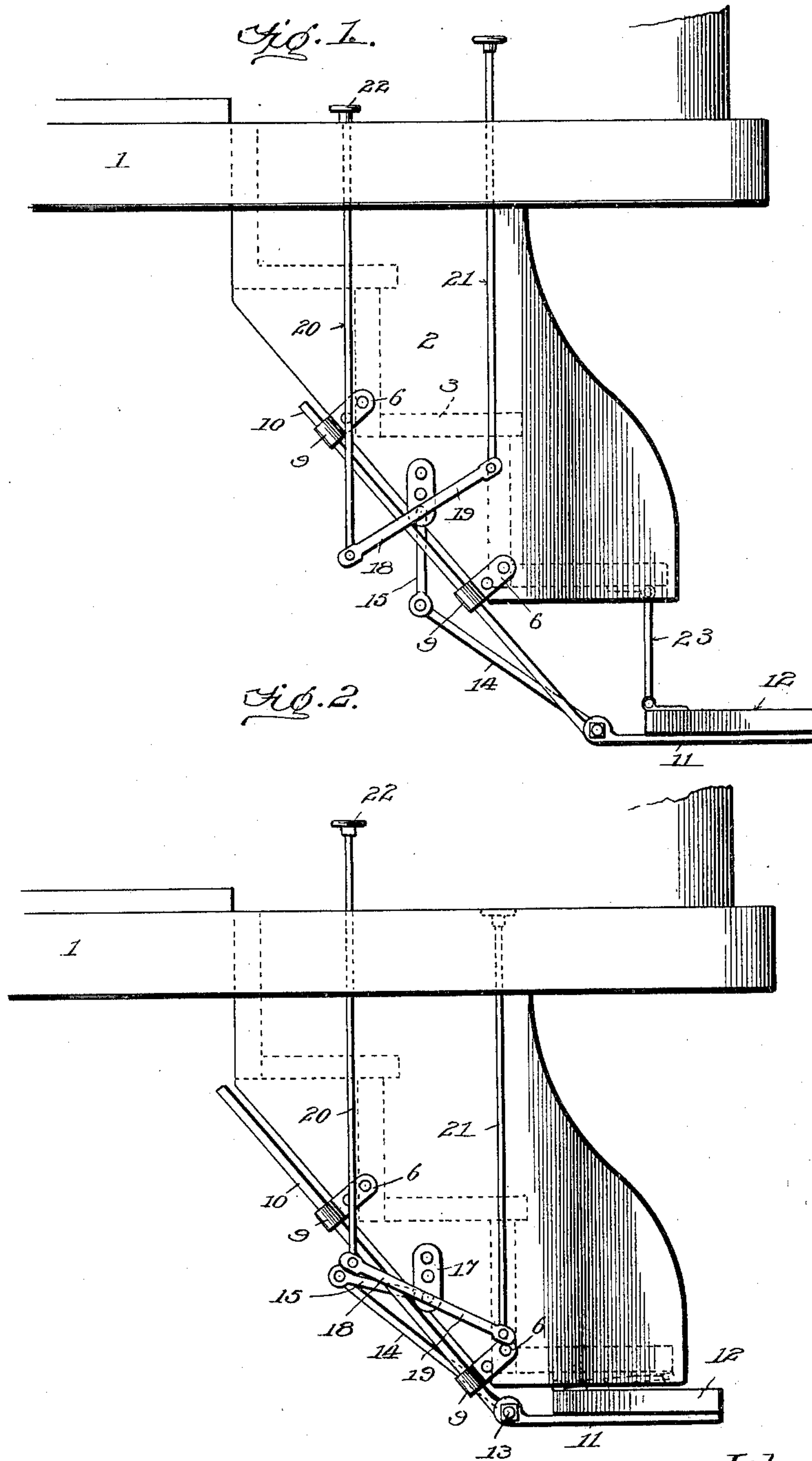
Patented May 14, 1901.

J. A. KRATZ.  
RAILWAY CAR STEP.

(Application filed May 31, 1900.)

(No Model.)

4 Sheets—Sheet 1.



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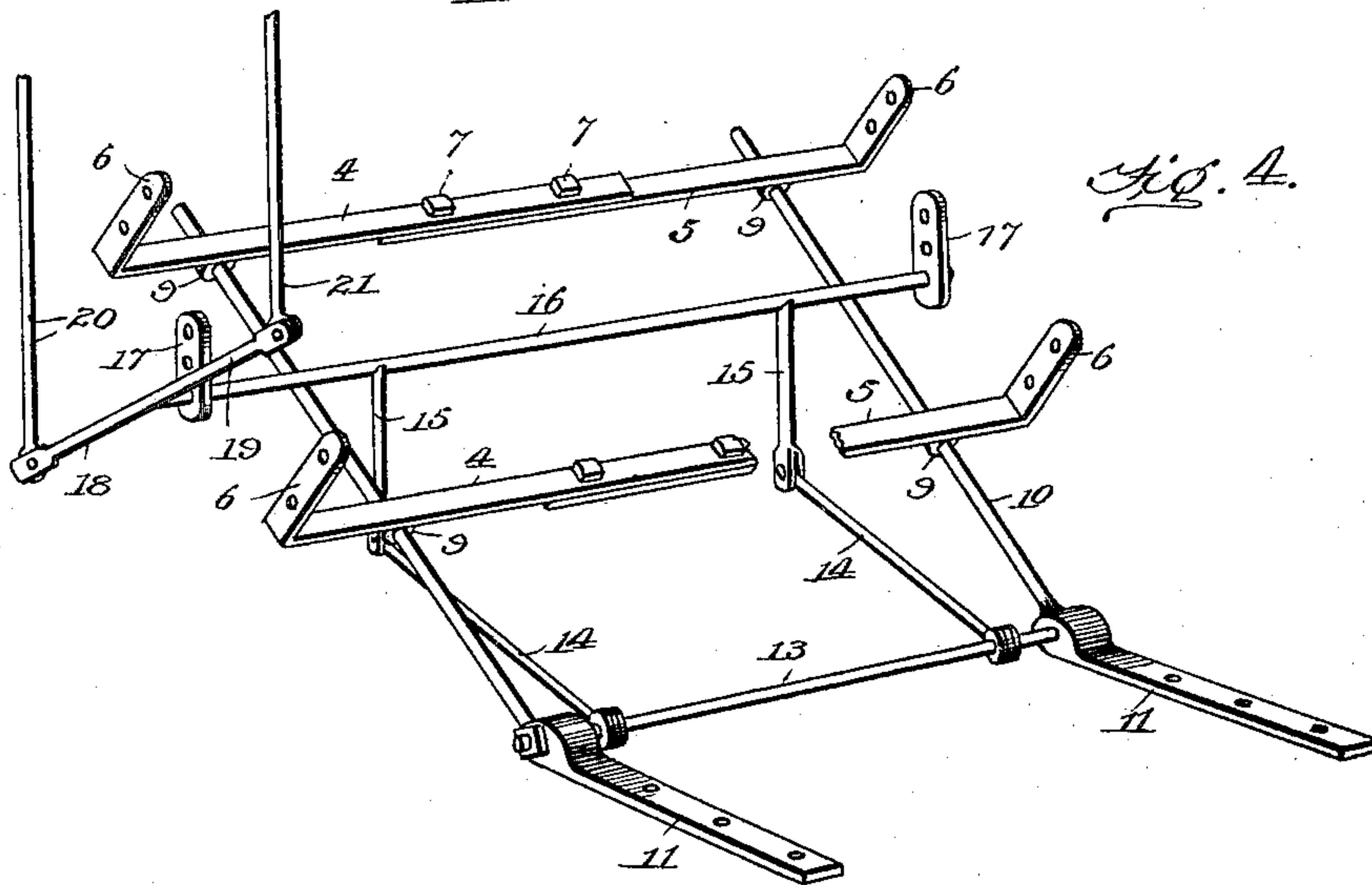
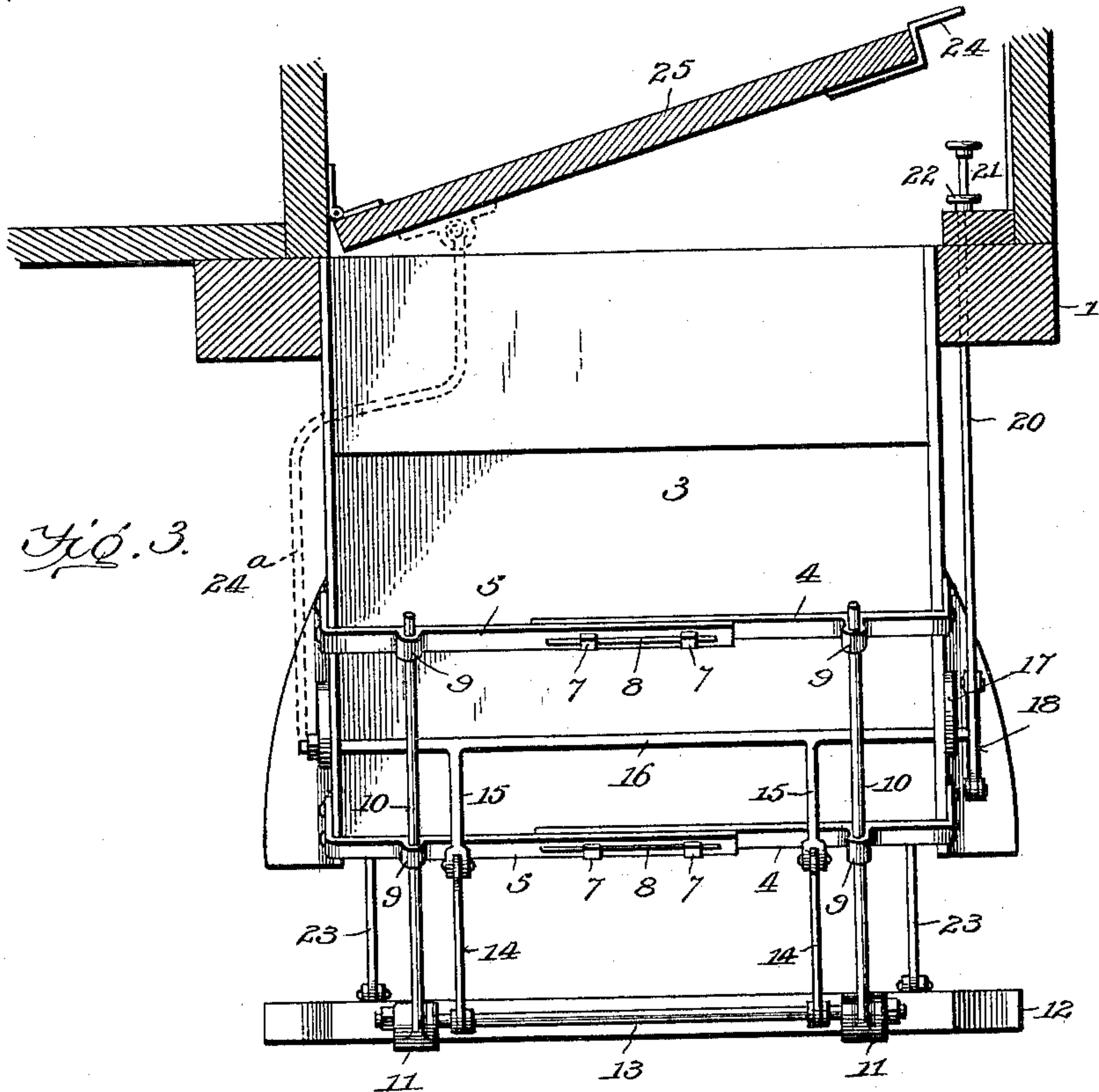
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4 Sheets—Sheet 2.



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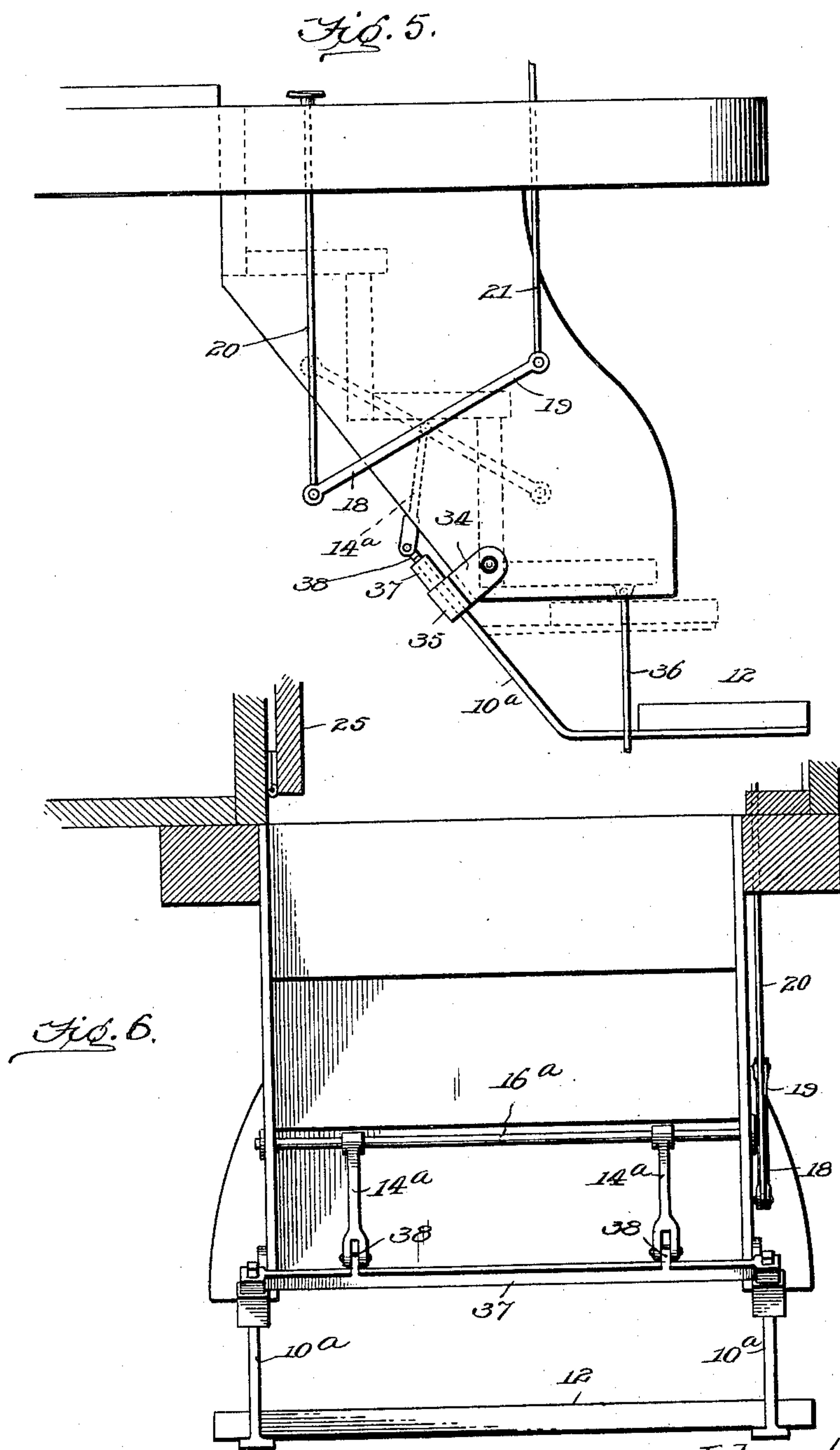
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**4 Sheets—Sheet 3.**





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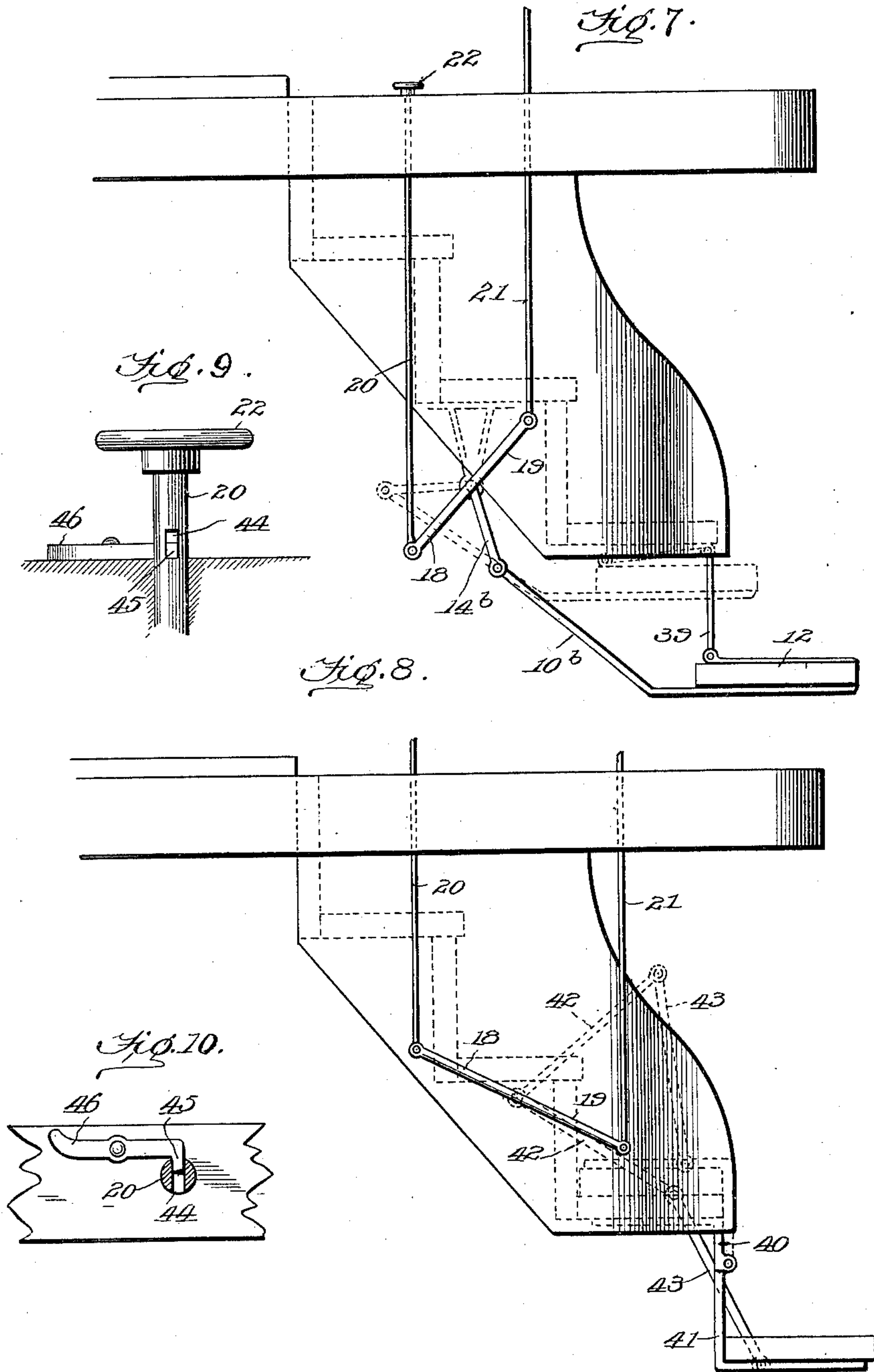
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4 Sheets—Sheet 4.



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# UNITED STATES PATENT OFFICE.

JOHN A. KRATZ, OF BALTIMORE, MARYLAND.

## RAILWAY-CAR STEP.

SPECIFICATION forming part of Letters Patent No. 674,033, dated May 14, 1901.

Application filed May 31, 1900. Serial No. 18,578. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN A. KRATZ, a citizen of the United States, residing at Baltimore city, in the State of Maryland, have invented new and useful Improvements in Railway-Car Steps, of which the following is a specification.

My invention relates to railway-car steps; and its primary object is to provide a supplemental or extension step supported below the lower step of the stationary stairway of the car-platform and improved means for raising and lowering the supplemental step from the car-platform.

Further objects of the invention are to provide means for locking the supplemental step in its raised position and to generally improve the details of construction of the operating mechanism of movable car-steps to insure the ready and easy manipulation thereof.

The construction of the invention embodied in several different forms will be fully described hereinafter in connection with the accompanying drawings, which form a part of this specification, and its novel features will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a partial end elevation of a car equipped with my improved extension-step mechanism, the supplemental step being in its lowered position ready for use. Fig. 2 is a similar view showing the supplemental step in its raised or folded position. Fig. 3 is a rear elevation of a car-platform stairway with my improvements applied thereto. Fig. 4 is a view in perspective of the means for supporting and operating the supplemental step detached from the steps. Figs. 5 and 6 are respectively a side elevation and a rear elevation of a modified form of the invention. Fig. 7 is a side elevation of another modification. Fig. 8 is a similar view of a further modification, in which the supplemental step is turned up over the lowermost stationary step to rest thereon instead of being raised or folded to a position below said stationary step, as illustrated in the other figures of the drawings. Figs. 9 and 10 are detail views of means for locking the supplemental step in raised position.

The reference-numeral 1 designates a car-platform, and 2 the sides of the usual station-

ary stairway depending therefrom. On the back 3 of the framework of the stairway are arranged parallel bars, each comprising two sections 4 and 5, the outer ends 6 of which are bent at right angles to overlap the sides 2 of the stairway, to which they are securely bolted. The inner ends of the sections 4 and 5 overlap and are adjustably connected by bolts 7, which pass through bolt-holes in the sections 4 and elongated slots 8 in the sections 5. The adjustability of the bars adapts them for use with car steps or stairways of varying width. The bar-sections 4 and 5 are formed with guide loops or keepers 9, aligned vertically in pairs to receive parallel guide-rods 10, the lower ends of which are secured to the inner ends of brackets 11, secured to the under side of the extension or supplemental step 12. The inner ends of these brackets 11 are connected by a cross-bar 13, to which are pivotally secured the outer ends of parallel links 14, the inner ends of which are pivotally secured to crank-arms 15, projecting from a rock-shaft 16, supported in suitable bracket-bearings 17, secured to the sides 2 of the stairway. The shaft 16 is provided at its outer end with oppositely-projecting crank-arms 18 and 19, to each of which are pivotally attached the lower ends of operating-rods 20 and 21. These rods 20 and 21 extend through openings formed in the car-platform and are provided above the platform with treadles 22.

The step 12 is connected to the lower stationary step by hangers 23, pivotally secured at their upper ends to said stationary step and at their lower ends to the step 12, adjacent to the ends of the latter. These hangers relieve the keepers 9 from undue strain and support a portion of the weight on the step 12. The operation of the mechanism thus far described is as follows:

Normally the step 12 is in the raised position shown in Fig. 2 and the upper end of the push-rod 20 projects a sufficient distance above the surface of the platform to permit it to be depressed by the foot. By depressing the rod 20 the shaft 16 is rocked in its bearings, throwing the step 12 downward and outward to the position shown in Fig. 1, through the medium of the arms 15 and links 14, the movement of the parts being guided by the



rods 10, moving through the keepers 9. The depression of the rod 20 elevates the push-rod 21, as will be obvious, and when it becomes necessary to return the step to its elevated position the rod 21 is depressed, thus reversing the movement of the rock-shaft and raising the step 12 to the position shown in Fig. 2.

In Fig. 3 I have shown means for depressing the push-rod 20 and holding it in its depressed position, consisting of an arm 24, projecting from a supplemental hinged platform 25. When the hinged platform is closed down, its arm 24 strikes the upper end of the push-rod 20, forcing the rod down and elevating the step 12. The weight of the supplemental platform will keep the step in elevated position, and as soon as said platform is raised the step will drop by gravity to its lower position.

In Figs. 5 and 6 I have shown a modified construction which is simpler and consists of fewer parts than the form shown in the preceding figures. In this form of the invention two brackets 34 are pivotally secured to the sides 2 of the stairway, said brackets being formed with loops or keepers 35, through which extend the guide-rods 10<sup>a</sup>, secured to the step 12. Pivoted-link hangers 36 connect the step 12 with the lower stationary step of the car. The guide-rods 10<sup>a</sup>, which are much shorter than the rods 10 shown in Figs. 1 and 4, are connected at their upper ends by a cross-bar 37, formed with ears 38, to which are pivotally secured the lower ends of crank-arms 14<sup>a</sup>, projecting from a rock-shaft 16<sup>a</sup>, supported in suitable bearings and having at one end oppositely-extending crank-arms 18 and 19, pivotally secured to the lower ends of push-rods 20 and 21.

The operation of the mechanism shown in Figs. 5 and 6 is substantially similar to that already described, except that the open-link hangers 36 permit a slight canting of the step 12 and its guide-rods, and the brackets 34 have a slight pivotal movement as the rods 10<sup>a</sup> are elevated and lowered by the rocking of the shaft 16<sup>a</sup>.

In the modification shown in Fig. 7 the keepers for the guide-rods shown in the preceding figures are omitted, thus further simplifying the mechanism. The step 12 in this figure is pivotally secured at each end to one end of a hanger 39, the opposite ends of which are pivotally secured to the lower stationary step. The guide-rods 10<sup>b</sup> are pivotally secured at their upper ends to crank-arms 14<sup>b</sup>, projecting from the rock-shaft. The rock-shaft in this form of the device is also provided with the oppositely-projecting crank-arms 18 and 19, pivotally connected to the lower ends of the push-rods 20 and 21.

A further modification is shown in Fig. 8, in which the supplemental step 12 is adapted to be turned up over the lower stationary step instead of folded under the stationary step, as in the other figures. In this figure, 40 designates a bracket depending from the

lower stationary step, (one at each end,) to which are pivotally secured angle-brackets 41, secured to the supplemental step 12. The rock-shaft is provided with the arms 18 and 19 and is connected by links 42 and 43 with the step 12. When the rock-shaft is tilted by means of the push-rod 20, the step 12 is raised by the links 42 and 43 to the position shown in dotted lines in Fig. 8, while a reverse movement of said shaft, caused by depressing the push-rod 21, will tilt the step 12 outward and downward to the position shown by the full lines in Fig. 8.

As shown in Figs. 9 and 10, the push-rods 20 and 21 are each formed near the upper end with a slot 44, into which projects a dog 45, pivotally secured on the platform and having an extension 46, serving as a foot-piece, by means of which the dog is turned upon its pivot to engage or disengage the dog. Thus the supplemental step may be readily locked in raised position when it is not desired for use.

I claim—

1. The combination with the stairway of a railway-car platform; of a supplemental extension-step, and means for supporting and operating said supplemental step comprising longitudinally-movable guide-rods; a rock-shaft; crank-arms projecting from said rock-shaft and connected to said supplemental step; oppositely-projecting crank-arms at one end of said shaft; and means operated from the car-platform for rocking said shaft.

2. The combination with the lower stationary step of a car-platform; of a supplemental extension-step suspended by a pivoted hanger from said stationary step; longitudinally-movable guide-rods arranged in rear of said stationary step; a rock-shaft having projecting crank-arms; links connecting said crank-arms and supplemental step; oppositely-projecting crank-arms at one end of the shaft; and means for rocking said shaft from the car-platform.

3. The combination with a railway-car platform; of a supplemental extension-step adapted to be raised to a position below the lower stationary step of the platform; guide-rods secured to said supplemental step; longitudinally-adjustable bars provided with keepers for said guide-rods; and means for raising and lowering the supplemental step comprising a rock-shaft, crank-arms projecting therefrom and connected to the supplemental step; a crank at one end of said shaft, and means for rocking said shaft.

4. The combination with a car-platform; of a supplemental extension-step; and means for raising and lowering said step, comprising a rock-shaft; crank-arms projecting from said shaft and connected to said step; oppositely-disposed crank-arms projecting from one end of said rock-shaft; and push-rods pivotally secured to said oppositely-disposed crank-arms and extending through the platform.



5. The combination with a car-platform; of a supplemental extension-step; and means for raising and lowering said step comprising a rock-shaft; crank-arms projecting from said shaft and connected to said step; oppositely-disposed crank-arms at one end of said shaft; means for rocking said shaft from the car-platform; and longitudinally-movable guide-rods connected to said step.
6. The combination with a car-platform; of a supplemental extension-step; a rock-shaft having crank-arms for raising and lowering said step; oppositely-disposed crank-arms at one end of said shaft; push-rods connected to said oppositely-disposed crank-arms, and adapted to be operated from the car-platform; and means for locking said push-rods to maintain the step in raised position.

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

JOHN A. KRATZ.

Witnesses:

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W. H. RIMMEY.