

No. 687,921.

Patented Dec. 3, 1901.

H. KARBERG.  
HATCH FOR ELEVATOR SHAFTS.

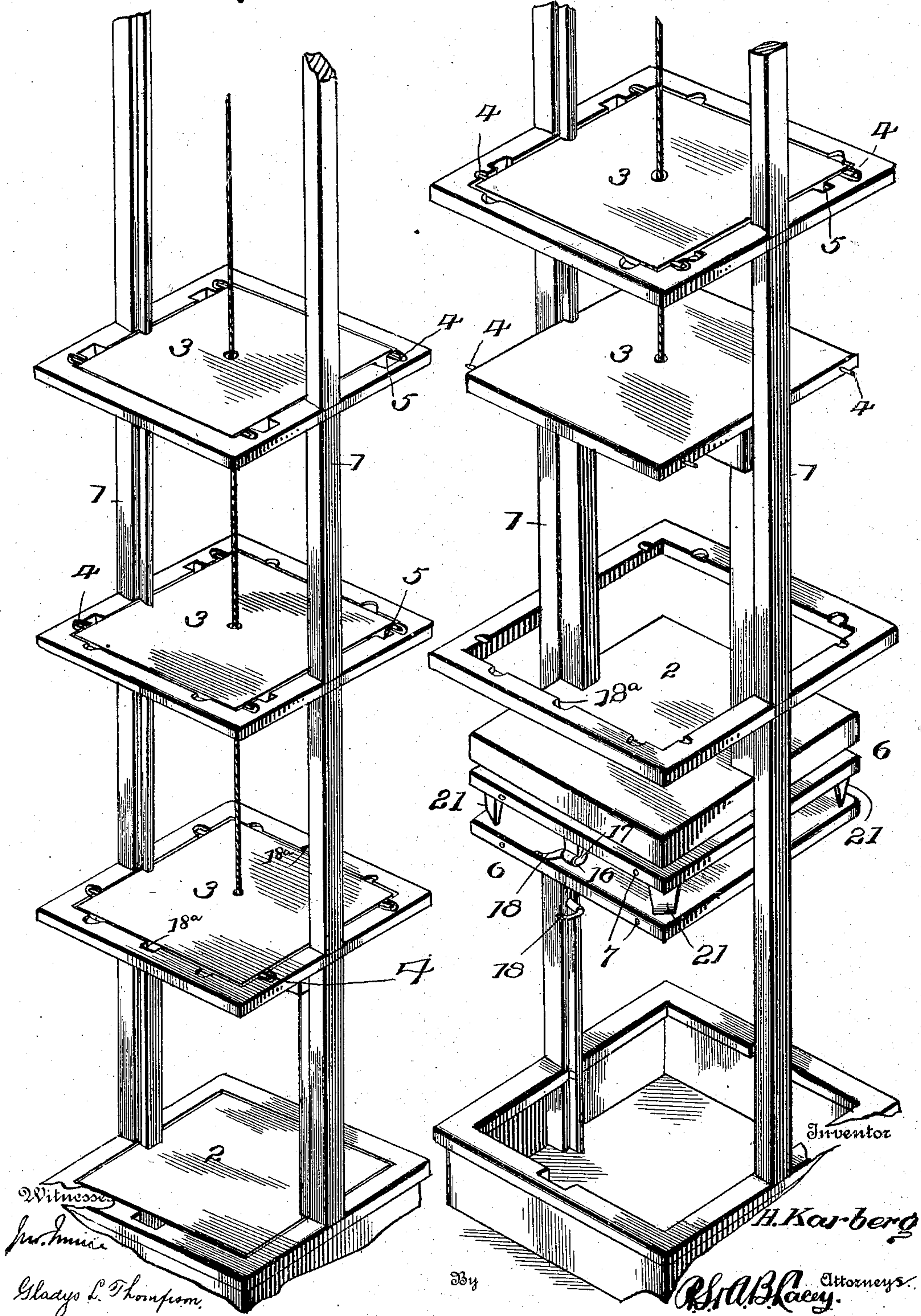
(Application filed Nov. 28, 1900.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 1.

FIG. 2.



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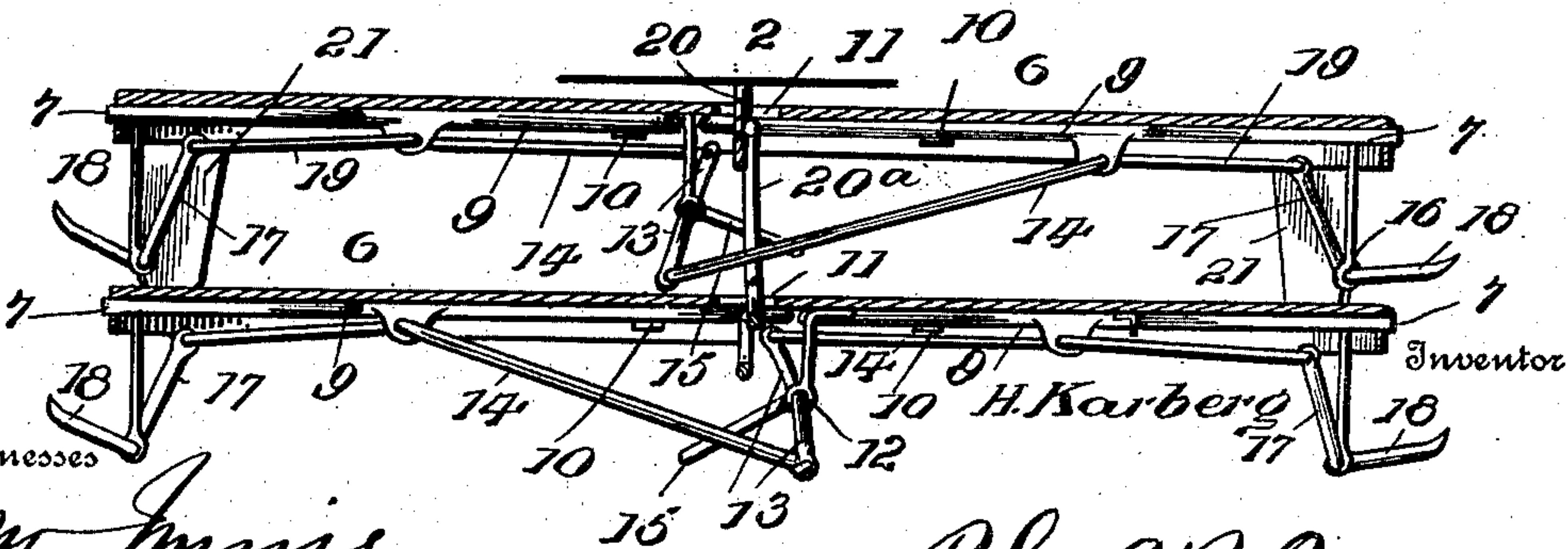
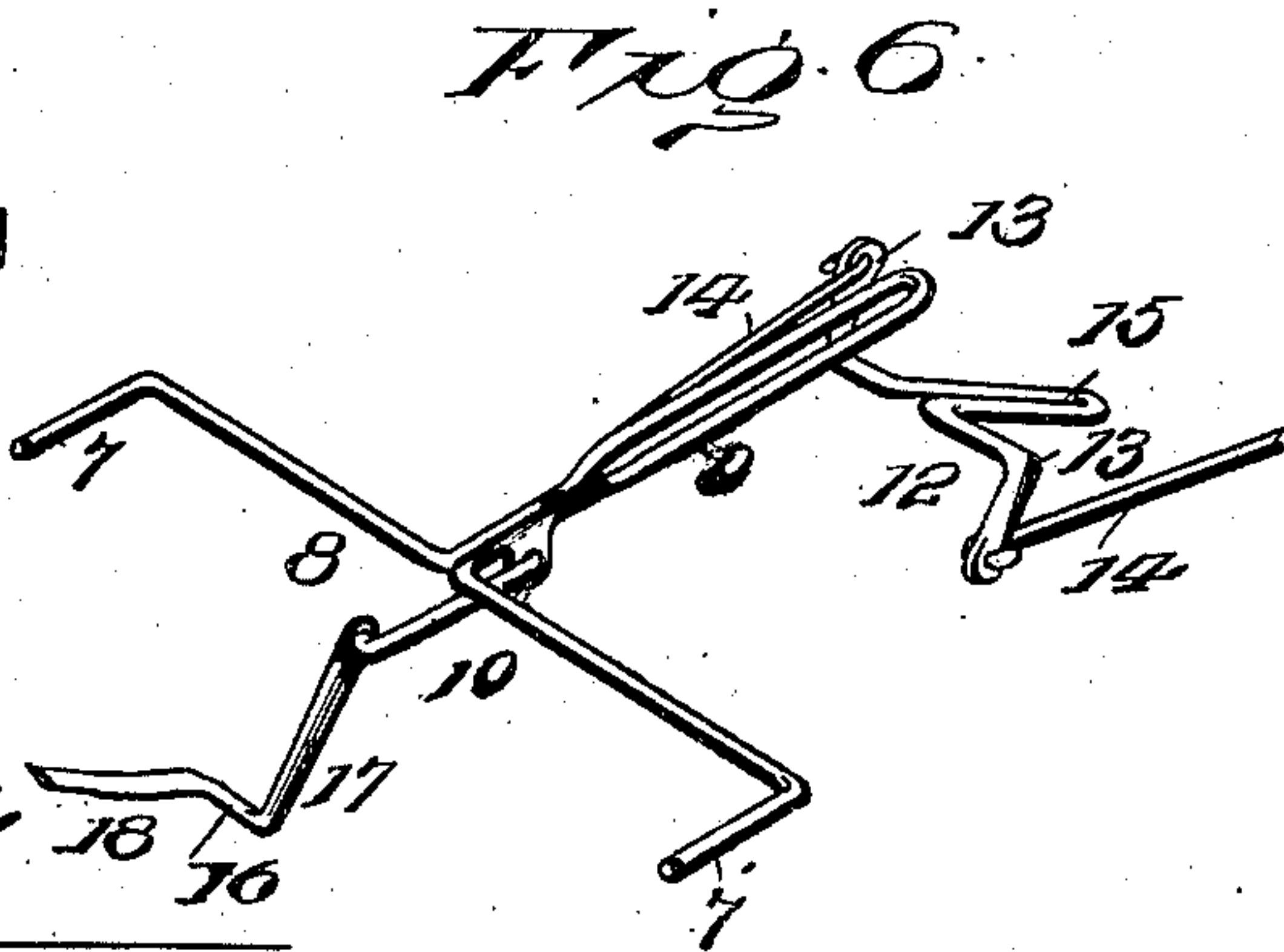
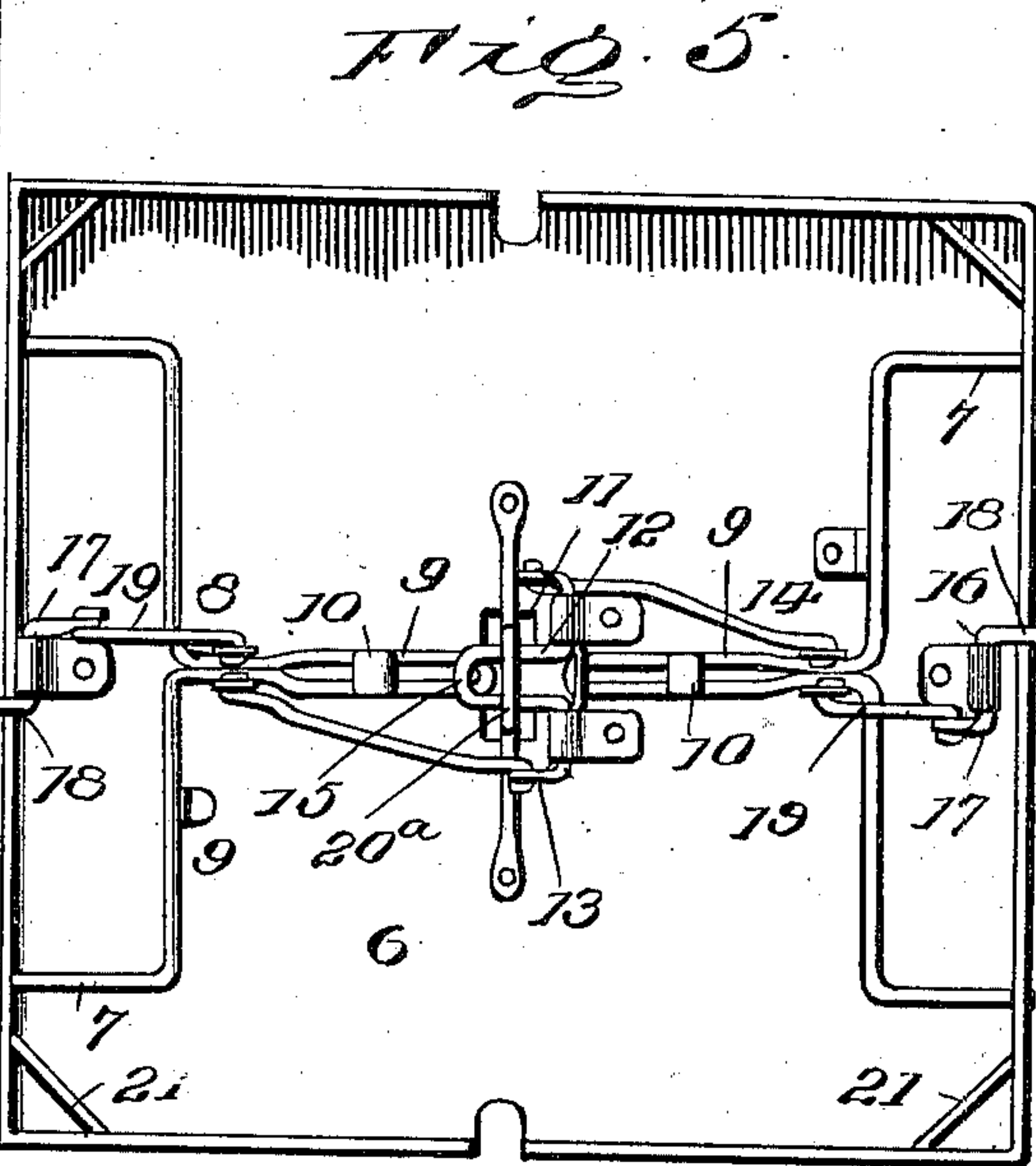
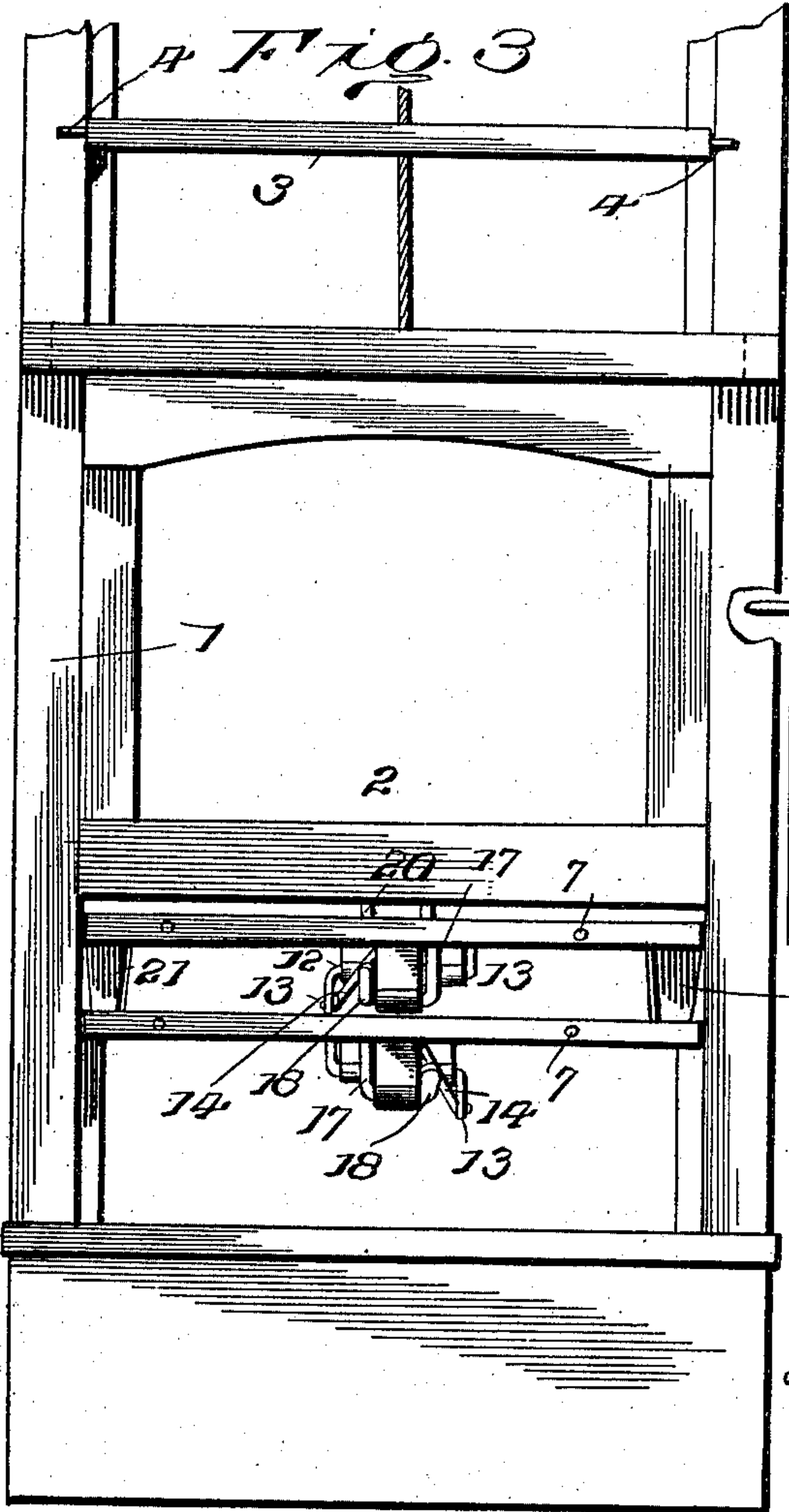
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2 Sheets—Sheet 2.



Witnesses

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# UNITED STATES PATENT OFFICE.

HERMANN KARBERG, OF ST. LOUIS, MISSOURI.

## HATCH FOR ELEVATOR-SHAFTS.

SPECIFICATION forming part of Letters Patent No. 687,921, dated December 3, 1901.

Application filed November 28, 1900. Serial No. 38,026. (No model.)

*To all whom it may concern:*

Be it known that I, HERMANN KARBERG, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Hatches for Elevator-Shafts; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to elevators, and more particularly to closures for the openings in the floors or landings through which the car passes in ascending and descending, thereby minimizing the casualties resulting from open hatchways even when fenced in and accessible by doors designed to be kept closed when the car is not at the landing.

In accordance with this invention the hatches are provided in two sets, an upper set and a lower set, so designated because of their position with reference to the car. The hatches of the upper set are carried upward above the car when at the topmost landing. When passing a landing in either direction, the car takes up a hatch and leaves a hatch, thereby maintaining the hatchway in closed condition.

This invention deals more particularly with the means for supporting the hatches at the landings and suspending those of the lower set from the car, so as to insure their detachment from the car on its ascent and their attachment to the car on its descent.

For a full description of the invention and the merits thereof, and also to acquire a knowledge of the details of construction of the means for effecting the result, reference is to be had to the following description and drawings hereto attached.

While the essential and characteristic features of the invention are necessarily susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of an elevator, illustrating the application of the invention, the car being at its lowest point and the upper set of hatches in position. Fig. 2 is a view similar to Fig. 1, the car passing the first landing. Fig. 3 is a front view. Fig. 4 is a transverse section of two hatches of the

lower set, showing them in suspension. Fig. 5 is a view of a lower hatch inverted. Fig. 6 is a perspective view of a suspending-frame and the trips coöperating therewith.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The elevator may be of any type and form of construction, according to its finish and specific purpose. That shown is of ordinary construction and comprises oppositely-disposed guide-posts 1, midway of the shaft and the car 2, the latter being directed in its vertical movements by the guide-posts 1 and raised and lowered by any selected mechanism. (Not shown.) The openings or hatchways at the several landings are preferably of uniform size and are normally closed by hatches, which, in connection with their supporting and actuating means, constitute the vital feature of this invention. The several hatches, like the car 2, are properly positioned by means of the guide-posts 1 or rails fitted thereto, this being essential to the successful operation of the invention. There will be a hatch for each landing, and the sets of hatches are designated as "upper" and "lower" because of the irrelative location with reference to the car. The hatches 3 are located above the car and are carried upward thereby upon its ascent. Pins or stops 4 project outwardly from the four corners of each hatch 3 and are differently positioned horizontally, so as to engage with the proper landings and support the hatches in the openings or hatchways thereof. The pins or stops 4 of the topmost hatch 3 are positioned to engage with the portion of the uppermost landing bordering upon the opening therein, so as to prevent said hatch passing therebelow. Notches 5 are formed in the edge portions of the landings for the passage there-through of the pins or stops 4 and are so positioned with reference to said pins as to obstruct the passage of the hatch by the landing for which it is designed. The notches 5 decrease in width from the topmost landing downward, the uppermost notches being the widest to admit of the passage of the pins or stops therethrough of all the hatches below the topmost hatch. When the car 2 is at the upper landing, the hatches 3 of the upper set



are carried upon the top thereof, and as the car descends the hatches 3 are left at the different landings in regular order, the lowermost hatch 3 passing by the intermediate landings and stopping at the first landing with which its pins or stops 4 engage, the pins or stops 4 of the lowermost hatch passing through the notches 5 of the upper and intermediate landings, as will be readily understood. The hatches 6 of the lower set are suspended from the bottom of the car when at its lowest position and are constructed to be left at the different landings in successive order upon the ascension of the car to its highest point. Each hatch 6 is provided with duplicate mechanism operating in substantially the same manner. Hence a detailed description of the mechanism applied to one only will be given. Bolts 7 are provided near the corners of the hatches 6 and are adapted to be shot outward therefrom, so as to overlap the landings and support the hatches in the openings thereof. These bolts are connected in pairs by means of a rod 8, from which an arm 9 projects in an opposite direction to the bolts 7. The arms 9 are preferably in the form of elongated loops and constitute folds of a rod or bar of proper gage doubled upon itself and bent so as to provide the rod 8 and bolts 7. Obviously the arm 9 may have any desired form other than that illustrated so long as it performs the function hereinafter ascribed thereto. The bolts 7 are mounted so as to be shot in and out and are held to the hatch against casual displacement. A fastening 10 is secured to the hatch and co-operates with the arm 9 to hold it in place and direct it in its reciprocating movements. As shown, this fastening 10 is headed and passes through the loop 9, portions of the head underlapping the side members of the loop and confining it between the hatch and the head of the fastening. The arms or loops 9 are centrally disposed and are of different lengths, the longer arm being adapted to project across a slot or opening 11, formed centrally in the hatch 6. A crank-shaft 12 is located adjacent to the slot or opening 11 and to one side thereof and is provided at its ends with oppositely-disposed crank-arms 13, connected by links 14 with the respective arms or loops 9, so as to effect a sliding movement thereof and the bolts 7 connected therewith. The crank portion 15 of the crank-shaft 12 is positioned so as to project across the path of the staple or kindred device, hereinafter described, adapted to pass through the slot or opening 11. When the crank portion 15 is struck by the staple or part passing through the slot or opening 11, the crank-shaft 12 is turned in its bearings and moves the arms 9 inward and withdraws the bolts 7 from engagement with the landing, thereby permitting the hatch to pass therebelow. Rock-shafts 16 are journaled in bearings adjacent to opposite edges of the hatch 6 and are provided with right-angul-

arms 18 constituting trips and adapted to engage with the landing and the vertical arms 17 being connected by links 19 with the respective arms 9, so as to project the bolts 7 when the arms or trips 18 come in contact with the landing. Simultaneously with the outward movement of the bolts 7 the longer arm 9 is withdrawn from engagement with the staple or kindred part from which the hatch is suspended, thereby releasing said hatch, when it will drop and be supported in the hatchway by means of the bolts 7, projected an instant prior to the release of the hatch. The staple 20, pendent from the bottom of the car 2, is adapted to pass through the slot or opening 11 of the upper hatch 6 and is engaged by the longer arm 9 thereof. The upper hatch 6 is provided with a staple 20<sup>a</sup>, which is adapted to pass through the slot or opening 11 of the hatch immediately below, so as to be engaged by the longer arm 9 thereof and to come in contact with the crank portion 15 of the crank-shaft 12, so as to withdraw the bolts 7 from said hatch and disengage it from the landing. Each hatch 6, with the exception of the lowermost one, is provided with a staple 20<sup>a</sup> to form a point of suspension and means for actuating the releasing mechanism of the hatches therebelow in regular order, as hereinbefore described. Spacing-pieces 21 are applied to the corner portions of the hatches 6 to hold them in parallel relation and to prevent their turning upon the suspending-staples. The bolts 7 are located in a higher plane than the horizontal arms or trips 18, and ample space is provided between the planes passing horizontally through the bolts and trips to admit of the bolts being sufficiently projected to engage with the landing prior to the release of the arm from its suspending device, so that the instant the hatch is released it will drop back a short distance upon the bolts 7 and be supported thereby.

The bolts 7 and the arms 9 connected therewith may be properly designated as "suspending-frames," and the crank portion 15 and the parts 18 are aptly designated as "trips" to effect a release of the suspending means according to the direction of travel of the car, the trip 15 being actuated upon the descent of the car to withdraw the bolts 7 and to project the arm 9 and the trips 18 being operated upon the ascent of the car to project the bolts 7 and to withdraw the arm 9.

When the car is at the lowermost landing, the lower set of hatches 6 are suspended therefrom and the upper set of hatches 3 close the hatchways or openings of the respective landings. As the car ascends and passes the first landing it carries upward the lowermost hatch 3 of the upper set and drops the lowermost hatch 6 of the lower set, and this operation is repeated at each landing, and when the car is at the topmost landing all the hatches 3 are supported thereby and the hatches 6 close the openings or hatchways of



the respective landings. As the car descends it takes up the hatches 6 in successive order and correspondingly leaves the hatches 3.

In order that the hatches may not project 5 above the plane of the landings, the latter are notched, so as to receive the pins or stops 4 and the bolts 7.

The hatches may be constructed of metal, 10 wood, or any material selected for the purpose and are preferably light, consistent with wear, so as not to weight the car to any very great degree.

The staples 20 and 20<sup>a</sup> constitute engaging 15 devices and are pendent from, respectively, the car and the hatch for coöperation with the suspending means 9 for holding the hatches pendent from one another and from the car. These staples are of a length to 20 push the outer ends of the trips 15 down a distance to shoot the parts 9 across and through the staples and withdraw the bolts 7 clear from the hatchway, when the hatch will drop a short distance to bring the part 9 in contact with the closed end of the staple, 25 as shown most clearly in Fig. 4. At this stage of the operation the lower ends of the staples will be elevated from the trips 15, as indicated in Fig. 4. To prevent the actua- 30 tion of all the trips 18 at the first landing upon the ascent of the car, the trips have different relative horizontal or transverse position, as shown to best advantage in Fig. 2, the said first landing having notches or cut- 35 away parts 18<sup>a</sup> for the passage therethrough of the trips 18 of the hatches, except the lowermost, whose trips 18 will engage with the first landing and effect a release of the bottom hatch only. The several hatchways in ascending order will be provided with cut- 40 away parts to permit the passage thereby of the hatches designed for upper landings. The last landing but one will trip the latch-hatch 6 of the lower set of hatches.

Having thus described the invention, what 45 is claimed as new is—

1. In an elevator, and in combination with the car and a series of hatches for closing the hatchways at the different landings, means 50 pendent from the car and the several hatches for successively releasing and suspending the hatches on the descent of the car, suspend-

ing means applied to the hatches for support- ing them either at the respective landings on the ascent of the car or from said pendent means on the descent of the car, and trips ap- 55 plied to the hatches for effecting their release in succession from said pendent means on the ascent of the car, substantially as de- scribed.

2. In an elevator, a car, a hatch, oppositely- 60 disposed sliding devices, said sliding devices being operatively connected together and applied to the hatch for supporting it in the hatchway, an engaging device located cen- 65 trally of the car to trip the said sliding devices on the descent of the car to release the hatch and at the same time cause one of the sliding devices to interlock with the aforesaid engag- 70 ing device to hold the hatch in suspension, and other trips for actuating the said sliding devices on the ascent of the car to effect en- gagement thereof with the hatchway and to withdraw the one from contact with the en- gaging device, substantially as set forth.

3. In combination with a hatch, oppositely- 75 disposed bolts, a shaft having oppositely-disposed arms connected with the respective bolts to move them simultaneously in oppo- site directions, and a trip in coöperative re- 80 lation with said shaft to effect a turning there- of, substantially as set forth.

4. In combination with a hatch, oppositely- 85 disposed suspending-frames, an arm applied to one of said frames to suspend the hatch from the car, trips connected with the re- 85 spective suspending-frames and adapted to engage with the hatchway to project the sus- pending parts of the frames to support the hatch in the hatchway, and a third trip op- 90 eratively connected with the said frames and adapted to be actuated by the suspending means movable with the car to release the hatch from the hatchway and engage the 95 aforementioned arm with the suspending de- vice of the car, substantially as set forth.

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

HERMANN KARBERG. [L. S.]

Witnesses:

ADAM LINCK,  
CHARLIE SCHROGER.