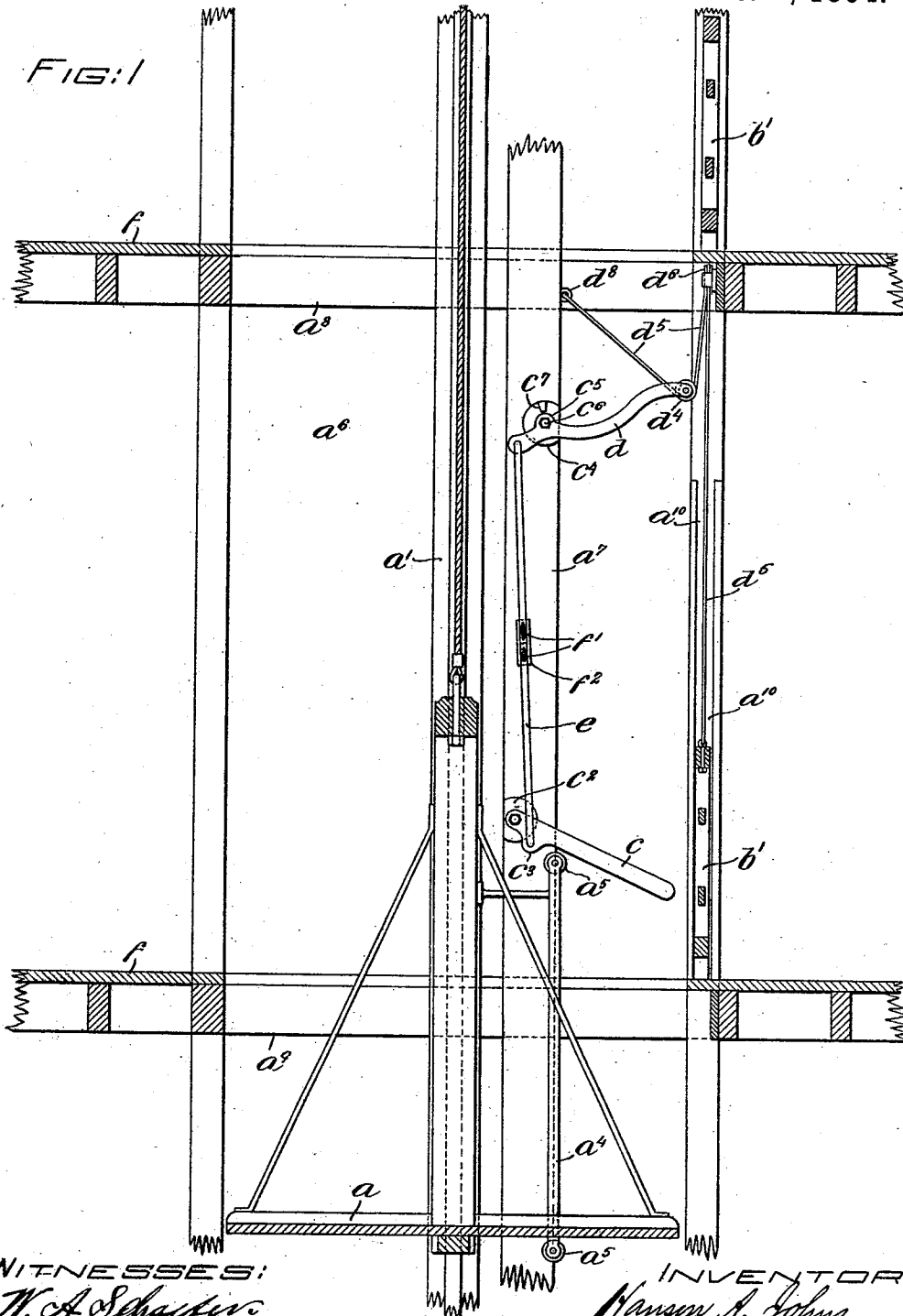


H. A. JOHNS.
ELEVATOR.

No. 530,273.

Patented Dec. 4, 1894.

FIG. 1



WITNESSES:

W. A. Schaefer

W. J. Jackson

INVENTOR.

Hanson A. Johns

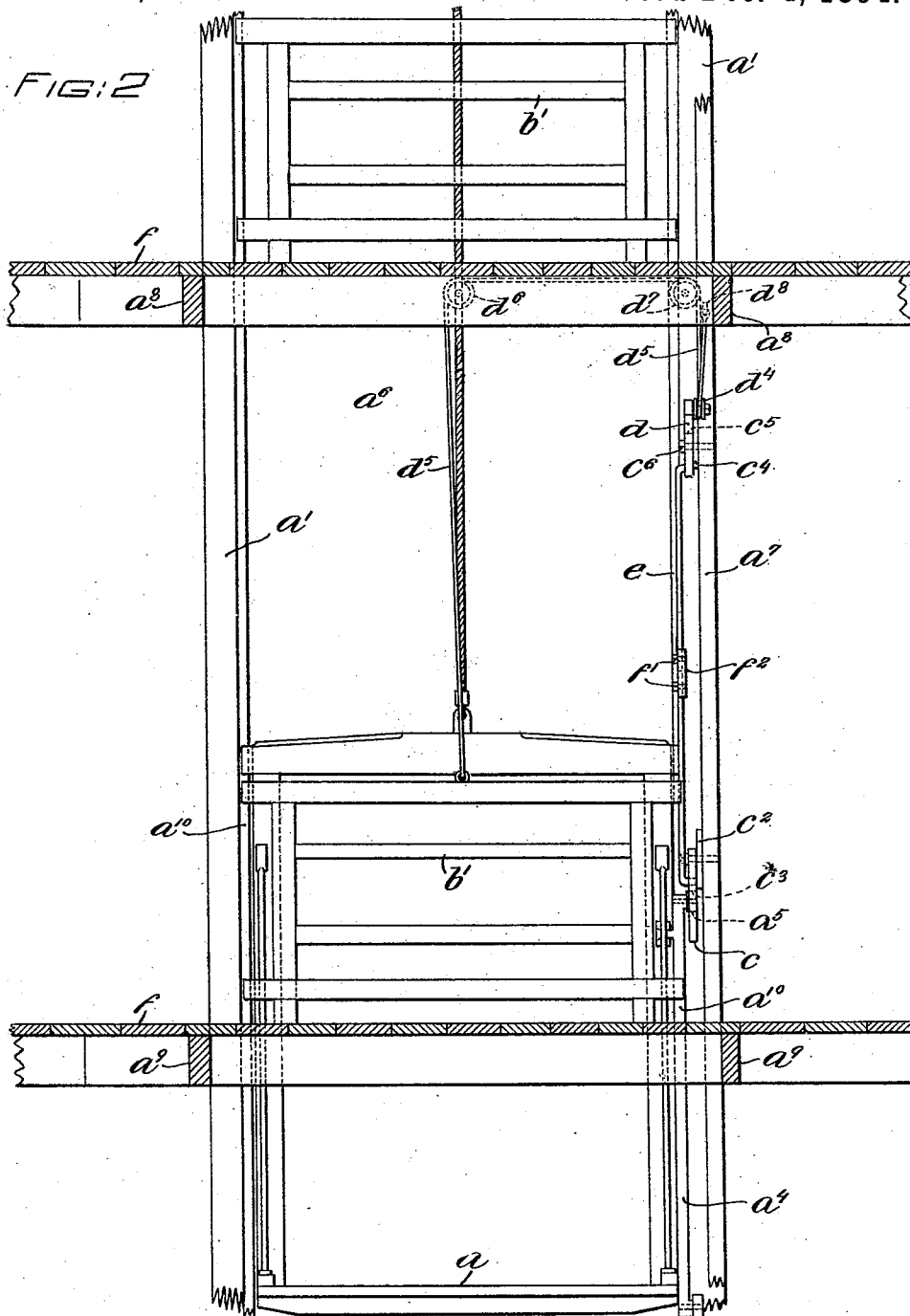
By J. Walter Douglass
ATT'Y.

H. A. JOHNS.
ELEVATOR.

No. 530,273.

Patented Dec. 4, 1894.

FIG. 2



WITNESSES:
W. A. Schaefer
W. J. Jackson.

INVENTOR,
Hanson A. Johns,
BY Walter Douglas
ATTY.

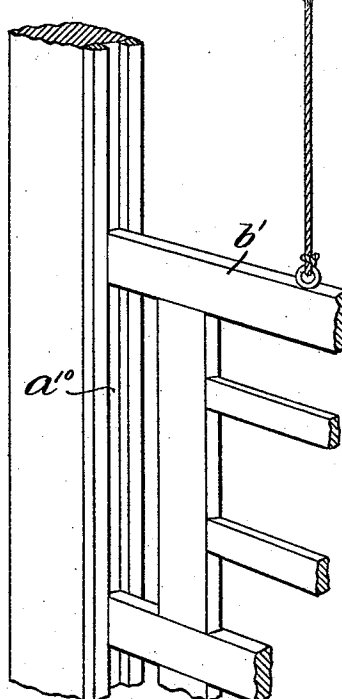
(No Model.)

4 Sheets—Sheet 3.

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(No Model.)

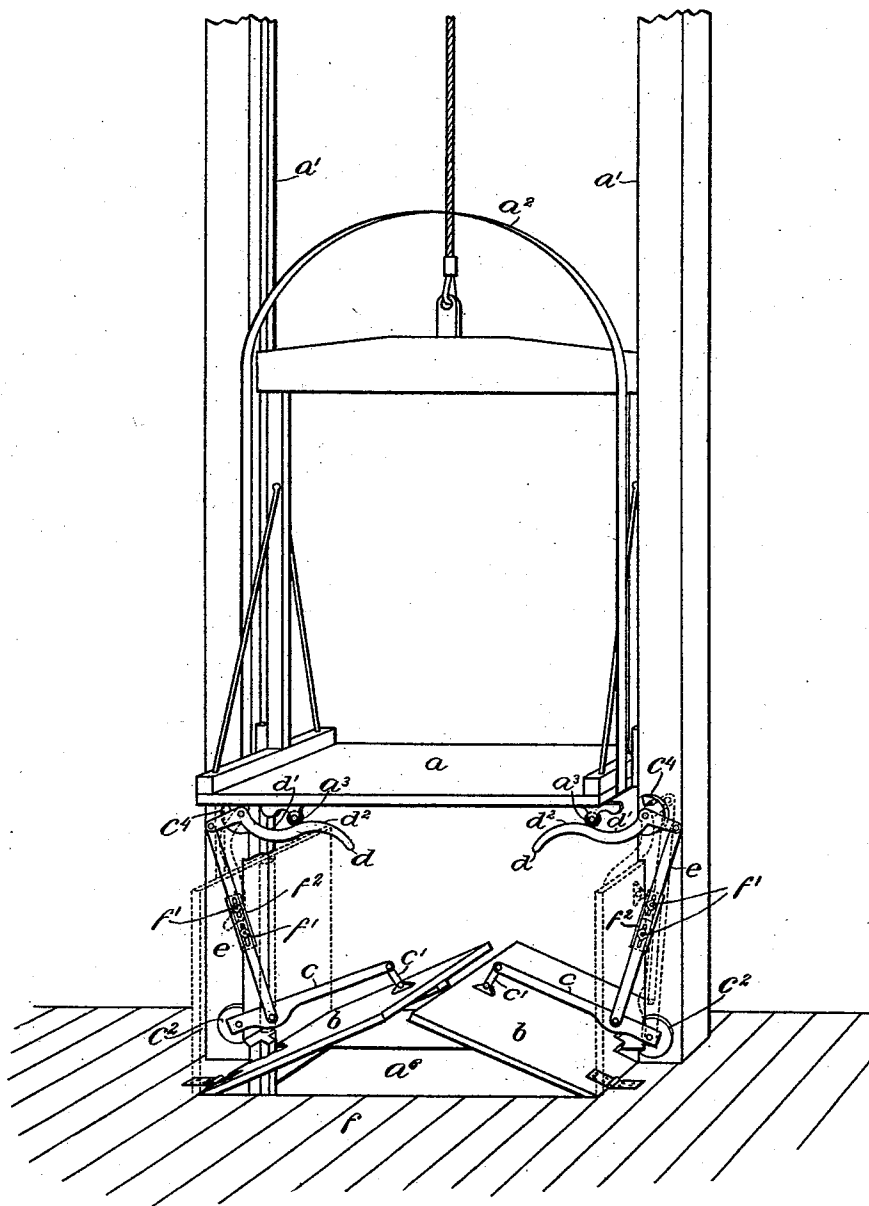
4 Sheets—Sheet 4

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FIG. 4



WITNESSES:

W. A. Schaefer
W. J. Jackson

INVENTOR:

Hansom A. Johns,
BY J. Walter Douglass.
ATTY.

UNITED STATES PATENT OFFICE.

HANSON A. JOHNS, OF PHILADELPHIA, PENNSYLVANIA.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 530,273, dated December 4, 1894.

Application filed August 24, 1894. Serial No. 521,190. (No model.)

To all whom it may concern:

Be it known that I, HANSON A. JOHNS, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Elevators, of which the following is a specification.

My invention has relation to elevators in general; and it relates more particularly to the construction and arrangement of mechanism for operating the doors of elevator hatchways.

The principal objects of my invention are, first, to provide simple, efficient and comparatively inexpensive mechanism for operating the doors of elevator hatchways; second, to construct and arrange operating mechanism for the doors of elevator hatchways in such manner that a differential motion is imparted thereto, so that undue strain is avoided; third, to cause the arms that operate the doors to overlap when in open position, whereby the doors are held clear of the car; fourth, to provide the mechanism with adjustable links whereby the same may be accommodated to elevator doors of different sizes or kinds; fifth, to provide the bearing plate or stud of the levers with back-stops so that a positive return to position, after being actuated by the car, is insured; sixth, to provide a mechanism for operating the doors of elevator hatchways automatically controlled by the car in the ascent and descent thereof, and, seventh, to provide a mechanism for actuating the doors of an elevator hatchway automatically controlled by the car in the ascent and descent thereof and in which the same is employed without having to cut into the walls of the elevator well, guide posts or side wall and the arrangement being such that the return of the lever-arms to their initial positions is insured.

My invention consists of the improvements in elevators hereinafter described and claimed.

The nature and characteristic features of my invention will be more fully understood from the following description taken in connection with the accompanying drawings forming part hereof, and in which—

Figure 1, is a view partly in vertical section through an elevator well, showing a car and a slidable door and partly in side elevation mechanism for operating said slidable door of the hatchway automatically through the intervention of the car in the ascent and descent thereof, embodying features of my invention. Fig. 2, is a front view of the elevator hatchway or well and slidable door with my invention shown in application for controlling the movement of the slidable door or doors thereof by the ascent and descent of the car. Fig. 3, is a perspective view on an enlarged scale of the operating mechanism for controlling the movement of the slidable door by the ascent and descent of the car, in dotted lines one of the slidable doors being shown elevated and in full lines the door being shown in its initial position for preventing access being had to the elevator car; and Fig. 4, is a perspective view of the mechanism for actuating the hinged doors of an elevator hatchway embodying the features of my invention and actuated by the car in the ascent and descent thereof.

Referring to the drawings *a*, is an elevator car suitably supported upright by stiles, guides or beams *a'*, and adapted to be raised and lowered in engagement therewith.

The car *a*, in Fig. 4, is provided with a bow-shaped yoke *a²*, to permit of the opening of the hinged doors *b*, in order to allow of the ascent of the elevator car.

The car *a*, in Figs. 1, 2 and 3, is provided with a projecting side guide, strip or band *a⁴*, having end rollers or travelers *a⁵*, at the top and bottom thereof, adapted to engage levers to be hereinafter explained, for controlling by the ascent and descent of the car the position of the slidable door *b'*, of each floor of the building leading to the elevator shaft, well or hatchway *a⁶*.

c, in Figs. 1, 2 and 3, is a lever pivoted at one end to a bearing or stud plate *c²*, secured to a guide or post *a⁷*, which is located adjacent to one of the stiles, guides or beams *a'*, and securely held against the cross-beams or stringers *a⁸* and *a⁹*, in any preferred manner. The lever *c*, has an integral rear lower projection *c³*, with an opening therein for the reception of one end of an adjustable or ex-

tensible link e , which is pivoted at its opposite end to a complementary lever d . This lever is pivotally connected to a bearing or stud plate c^4 , secured to the post a^7 . The link e , 5 pivotally engages with the lever d , at the rear end thereof, and the integral upper projection c^5 , by means of the pivot c^6 , establishes a movable connection of the same with the bearing or stud plate c^4 , of the support or 10 post a^7 . The stud or bearing plate c^4 , is provided with a back-stop c^7 , and the lower plate c^2 , may also be provided with a similar back-stop, not shown, whereby in the manipulation of the respective levers c and d , with rollers a^5 , of the projecting strip or band a^4 , the 15 range of their movement is limited and their return to initial positions positively insured, for effective working of the slidable doors b' , of the elevator hatchway, by means of the 20 car in the ascent and descent thereof.

The free extremity of the lever d , as shown in Figs. 1 and 3, has pivoted thereto a grooved roller d^4 , for a purpose to be presently explained.

25 d^5 , is a cord connected with the slidable door b' , afforded a range of movement in channeled ways a^{10} , of the frame-work of the elevator shaft or well and which cord d^5 , is led over pulleys d^6 and d^7 , of the frame-work 30 of the shaft, as shown in Figs. 1 and 3, and around the pulley d^4 , of the lever d , and engaging an eye d^8 , suitably secured into the post a^7 .

In Fig. 3, are shown in dotted and also in 35 full lines the positions of the slidable door b' , in the actuation of the levers c and d , connected with each other by the extensible link e , through the ascent and descent of the car a , and also the positions of the respective levers 40 when the slidable door b' , occupies a raised as well as closed position, which will be readily understood without further detail explanation thereof.

In Fig. 4, the levers c , are respectively pivoted 45 at one of their extremities to the upright guides or stiles a' , or to bearing plates applied and secured thereto, for example, in the same manner as illustrated in Figs. 1, 2 and 3. These levers at their other extremities are connected by means of links c' , with the hinged doors b . The levers d , are respectively pivoted intermediate of their ends to the upright guides a' , or to stud plates c^4 , 50 secured thereto and have their rear ends connected with the intermediate portions of the levers c , by means of adjustable or extensible links e . In the present instance, each of these links e , consists of two parts connected by a channel iron f^2 , by means of set-screws 60 f^1 , working in slots in said parts so that the length of the links e , may be increased or diminished to accommodate the mechanism to hinged doors of different dimensions. The front end of each of the levers d , is disposed 65 in range of a roller or projection a^3 , depending from the car and adapted to be thereby

hinged door b , as illustrated in dotted lines, when the car is descending. Moreover, the front end of each of the levers d , is reversely 70 curved as at d' and d^2 , in order to permit the roller or projection a^3 , to impart a differential motion to the hinged door b , hereinafter fully explained.

The mode of operation of the mechanism illustrated in Fig. 4, and as hereinbefore described, 75 is as follows:—When the car a , is descending the rollers or projections a^3 , contact with the concave portions d' , of the arms d , and thus cause the latter acting through the instrumentality of the adjustable or extensible links e , levers c and links c' , to open slowly the hinged 80 doors b . As the car a , continues to descend and after the inertia of the hinged doors b , has been overcome the projections or rollers a^3 , contact with the convex portions d^2 , of the lever arms d , thus causing the moving hinged 85 doors b to be rapidly opened. In this connection it may be remarked that power exerted upon the lever arms d , is applied by means 90 of the adjustable links e , to the levers c , at a point intermediate of their ends in such manner as that the latter are lifted from their closed positions with comparative ease. As 95 the car a , further continues to descend the lever arms d , are turned in a downward direction above the hinged doors b , and thus to maintain the latter in open position clear of the car until it has passed the floor f , whereupon the hinged doors moving under the influence 100 of gravity and controlled by the yoke a^2 , are permitted to close.

Having thus described the nature and objects of my invention, what I claim as new, 105 and desire to secure by Letters Patent, is—

1. In an elevator, the combination with a guide or stile, a door, levers, a back-stop, an extensible link connecting said levers and connections between one of said levers and said 110 door, of a car provided with rollers adapted to engage one of said levers, substantially as described.

2. In an elevator, the combination with a guide or stile, a door, levers, a stud plate secured to said guide or stile, a back-stop, an 115 extensible link connecting said levers, connections between one of said levers and said door, of a car and means on said car for engaging one of said levers, substantially as described. 120

3. In an elevator, the combination with a guide or stile and a door, of a lever pivotally connected at one extremity with said guide or stile, a link interposed between the other 125 extremity of said lever and said door, a car, an extensible link, a lever pivoted intermediate of its ends to said guide or stile and having its rear end connected with said extensible link and its front end disposed in range of a roller on said car, and said lever reversely 130 curved so as to impart differential motion to the car, substantially as described.

4. In an elevator, the combination with a door, levers, certain of said levers reversely

curved, an extensible link connecting said le-
vers with each other and connections between
one of said levers and said door, of a car
and means on said car for engaging said re-
5 versely curved levers to impart a differential
motion to said car, substantially as and for
the purposes described.

In testimony whereof I have hereunto set
my signature in the presence of two subscrib-
ing witnesses.

HANSON A. JOHNS.

Witnesses:

THOMAS M. SMITH,
RICHARD C. MAXWELL.