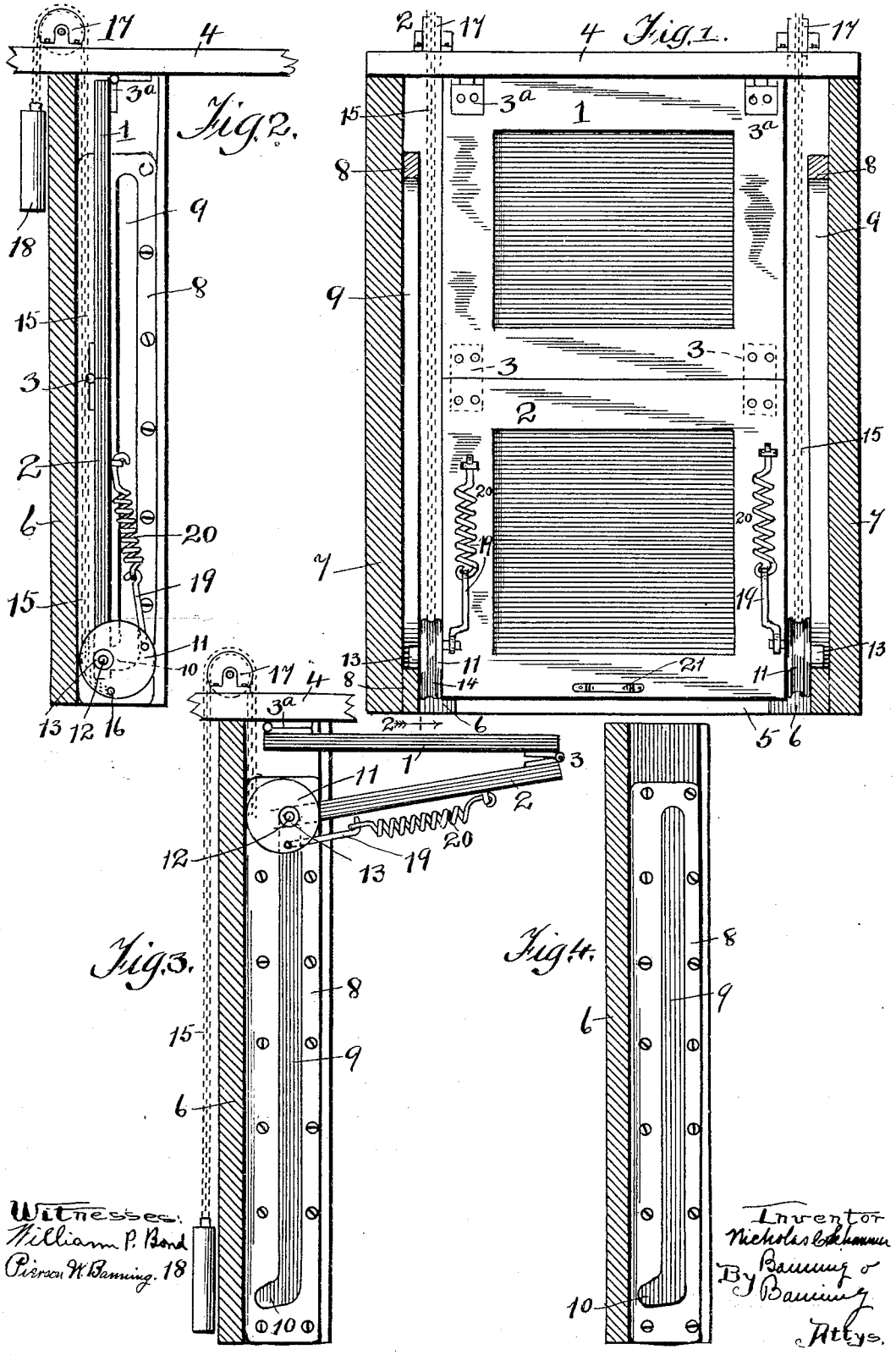
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N. C. SCHOMMER.

HINGED LIFTING DOOR.

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UNITED STATES PATENT OFFICE.

NICHOLAS C. SCHOMMER, OF CHICAGO, ILLINOIS.

HINGED LIFTING DOOR.

SPECIFICATION forming part of Letters Patent No. 784,896, dated March 14, 1905.

Application filed October 19, 1904. Serial No. 229,155.

To all whom it may concern:

Be it known that I, NICHOLAS C. SCHOMMER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Hinged Lifting Doors, of which the following is a specification.

This invention relates to lifting doors composed of two sections hinged together which are intended to fold together as the door is lifted, thereby economizing space and allowing the raised door to fold up against the ceiling. Difficulty has hitherto been experienced in the construction of such doors in providing means for initially buckling the door-sections outwardly to allow them to be raised. As ordinarily constructed, it is necessary to initially pull out the door at its center to throw the sections out of line with one another, which operation is slow and difficult and renders the use of such door objectionable.

The object of the present invention it to provide means for initially buckling the door-sections at their center prior to the lifting operation without complicating the lifting mechanism or necessitating the performance of additional operations.

As constructed the door of the present invention will be buckled and lifted by the same operation without loss or delay, thereby facilitating the operation of the door as a whole.

The invention consists in the features of construction and combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation of the door-sections in closed position; Fig. 2, an edge view, partly in section, taken on line 2 2 of Fig. 1 looking in the direction of the arrow and showing the door-sections lowered; Fig. 3, a similar view showing the sections raised, and Fig. 4 a detail of the guideways or slots within which the doors travel.

The door as a whole consists of an upper section 1 and a lower section 2, hinged together by means of hinges 3, and the door as a whole is hinged, by means of hinges 3^a, to a suitable support 4, which may be the ceiling of the room or other suitable structure. The doors are intended to close and open the passageway 5, at the sides of which are two contacting flanges 6, inwardly projecting from the side walls or supports 7 of the door-casing. On the inner faces of the side walls or supports are secured guide-plates 8 in suitable proximity to the guide-flanges 6, and said plates are each provided with a guide-slot 9, terminating at its lower end in a recess 10 in angular relation to the guide-slot 9 for a purpose to be hereinafter explained. It is obvious that the slots may be cut in the side walls instead of in plates secured to such walls, and the latter arrangement serves only for the purpose of illustration.

Near the bottom of the lower door-section, on opposite sides of the section, are cam-wheels 11, pivoted to the door by means of outwardly-projecting studs 12, which project through the cam-wheels and serve as a mounting for rollers 13, adapted to travel in the slotted guideways to properly position the door during the lifting operation. The cam-wheels 11 are so mounted that when the door-sections are closed or lowered and the rollers 13 have swung into the end recesses 10 the cam-wheels will abut against the flanges 6 at the point of their shortest axes, as shown in Fig. 1. Each of the cam-wheels is provided in the edge with a groove 14, extending partially or entirely around the periphery of the cam-wheel, and the groove serves as a guide for a chain or cable 15, which is passed partially around the cam-wheel and secured, by means of a pin 16 or other attaching means, near the lower edge of the cam when in normal position, as shown in Fig. 1. The chain or cable is carried over a suitably-mounted pulley-wheel and provided at its end with a counterbalance-weight 18 to aid in the operation of the door.

In order to facilitate the buckling of the door-sections at their hinge, a rod 19 is provided connected to the cam-wheel at a point dimetrically opposite to the point of normal contact, and said rod is connected, by means of a spring 20, to the lower door-section. If desired, the door may be provided with a handle 21 to aid in the lifting operation, although said handle may be dispensed with when desired.

In operation when the parts are in lowered position to close the opening 5 the rollers will rest in the terminal recesses 10 at the lower end of the guide-slots, and the door will lie in parallel relation with the inwardly-projecting flanges 6 of the door-opening and in close proximity to the same, thereby forming a tight closure for the opening or passage. When it is desirable to raise the door, tension is exerted on the chain or cable, which revolves the cam-wheel sufficiently to throw it out of the position shown in Fig. 2 into the position shown in Fig. 3, at which point the flange 6 will be contacted by and be tangent with a longer diameter of the cam, which serves to outwardly force the door as a whole away from the opening and into angular relation with the operating-cable. At the same time that the lower end of the door is being thrown out by the action of the cam the movement of such cam will exert a pull on the springs, which are connected to the lower section of the door near its upper edge, thereby pulling back the door near its hinged portion, which combined action serves to buckle the door preparatory to its being lifted. The movement of the cams throws the rollers out of the terminal recesses 10 into the straight guide-recesses, so that a continued tension on the cable will raise and fold up the lower section of the door into the position shown in Fig. 3, in which position the movement of the door is stopped by the abutment of the rollers 13 against the upper ends of the guide-recesses 9. This holds the door-sections in angular relation to one another, so that the lower section serves as a brace and relieves the hinges 3^a from undue strain. Under certain conditions it may not be necessary to employ the springs 20, which may be dispensed with without in any way interfering with the arrangement of the remaining mechanism.

It will be seen from the foregoing description that the raising of the door is performed by a single operation and that a uniform tension on the cable or chain serves to initially buckle the sections and afterward raise them without stoppage or interruption in the operation. The revolution of the cam will be limited by connecting the chain at the proper point, and the provision of the angular guideway serves to properly position the door at all times. Some portion of the cams will be in contact with the flanges 6 at all times, thereby serving to hold the door rigid and prevent jarring or rattling, and at the same time the cams will serve as abutments when the parts are in raised position, which will relieve the rollers from the strain of sustaining the door. When the door is lowered, the cam will be returned to normal position by the action of the spring and by the travel of the rollers, thereby giving a smooth and uniform travel during both raising and lowering of the door.

What I regard as new, and desire to secure by Letters Patent, is—

1. A door consisting of two sections, hinges connecting the sections together, a hinge connecting the upper section with a suitable support, a cam pivoted to one of the sections, an abutment adapted to be contacted by the cam, and a chain or cable connected with the cam and adapted to initially revolve the cam to contact the abutment and outwardly project the door-sections and then raise and fold up the door, substantially as described.

2. A door consisting of two sections, a hinge connecting the sections together, a hinge for securing the upper section of the door to a suitable support, cam-wheels pivoted to the lower section of the door, abutments adapted to be contacted by the cam-wheels for outwardly swinging the door, and chains or cables connected with the cam-wheels and adapted to initially revolve the cam-wheels and then raise and fold up the door-sections, substantially as described.

3. A door consisting of two sections, hinges connecting the two sections together, hinges for connecting the upper section to a suitable support, cam-wheels pivoted to the lower section on opposite sides thereof, guide-rollers outwardly projecting from the cam-wheels at their pivotal point, guideways within which the rollers travel, abutments adapted to be contacted by the cam-wheels, and chains or cables connected to the cam-wheels for initially revolving the cam-wheels to contact the abutments and outwardly project the door and allow it to be buckled and folded by the continued movement of the chains or cables, substantially as described.

4. A door consisting of two sections, hinges connecting the two sections together, hinges for connecting the upper section to a suitable support, cam-wheels pivoted to the lower section on opposite sides thereof, guide-rollers outwardly projecting from the cam-wheels at their pivotal point, guideways within which the rollers travel, abutments adapted to be contacted by the cam-wheels, chains or cables connected to the cam-wheels for initially revolving the cam-wheels to contact the abutments and outwardly project and initially buckle the door and then raise the door, and springs connecting the cam-wheels with the lower door-section entirely buckling the door, substantially as described.

5. A door consisting of two sections, hinges connecting the sections together, hinges for securing the upper door-sections to a suitable support, cam-wheels pivoted near the bottom of the lower door-section on opposite sides, abutments adapted to be contacted by the cam-wheels on the side of their shortest diameters when the doors are in closed position, guide-rollers outwardly projecting from the cam-wheels at their pivotal points, guide-slots terminating in angularly-disposed end recesses

within which slots the guide-rollers operate, and chains or cables carried partially around the cam-wheels when in normal position and adapted to revolve the cam-wheels out of normal position to contact the abutments at a point of greater diameter to thrust forward the door-sections preparatory to being folded and raised, substantially as described.

6. A door consisting of sections, hinges connecting the sections, a hinge connecting the top section with a suitable support, a cam on one of the sections, an abutment adapted to be contacted by the cam to outwardly project the door from normal position, and a chain or cable connected with the lower section and adapted to move the cam into contact with the abutment to outwardly project the door and allow the door-sections to be buckled and the door to be folded by the continued movement of the chains or cables, substantially as described.

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