

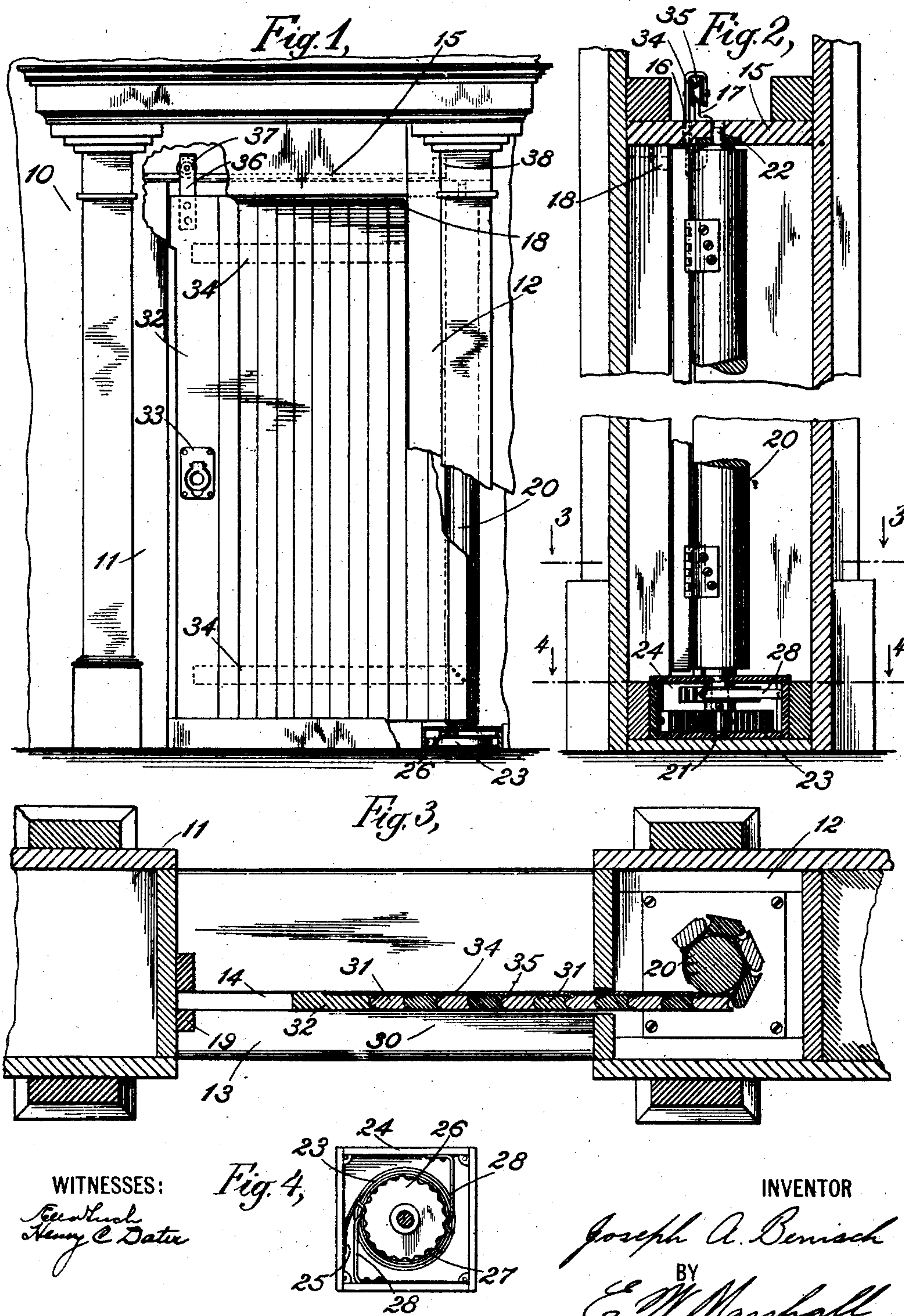
No. 864,503.

PATENTED AUG. 27, 1907.

J. A. BENISCH.

DOOR.

APPLICATION FILED MAR. 29, 1907.



UNITED STATES PATENT OFFICE.

JOSEPH A. BENISCH, OF NEW YORK, N. Y.

DOOR.

No. 864,503.

Specification of Letters Patent.

Patented Aug. 27, 1907.

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To all whom it may concern:

Be it known that I, JOSEPH A. BENISCH, a citizen of the United States, and a resident of the city of New York, in the county of New York and State of New York, United States of America, have invented certain new and useful Improvements in Doors, of which the following is a specification.

My invention relates to new and useful improvements in doors and its object is to provide a disappearing door which, when opened, is wound up about a vertical spindle within a hollow portion of the casing and which, when closed, effectively closes the door opening.

I will describe my invention in the following specification and point out the novel features thereof in claims.

Referring to the drawings, Figure 1 is a vertical front elevation of a door and its associated parts made according to my invention, some of the parts being broken away to show its construction. Fig. 2 is a sectional end elevation on a larger scale of my door and its operating mechanism. Fig. 3 is a sectional plan view of the parts shown in Figs. 1 and 2, the section being taken through the line 3—3 of Fig. 2 and the door proper being shown in a partially closed position. Fig. 4 is a sectional plan view of a spring operating mechanism and holding device which I use in carrying out my invention, the view being taken through the line 4—4 of Fig. 2.

Like characters of reference designate corresponding parts in all of the figures.

10 designates a door frame.

11 and 12 are vertical columns forming the door posts. These may be of any desired form of construction, but the post 12 must be made hollow for the reception of certain parts which I will point out later.

13 designates the threshold which is preferably provided with a groove 14.

15 is the lintel through which a slot 16 is cut. There is an angle-iron 17 securely attached to the lintel 15 which serves the purpose of a rail for supporting the outer end of the door.

20 designates a vertical spindle which is within the hollow column or door post 12. The bottom of this spindle is pivoted at 21 and the top of the spindle is pivoted at 22 in the lintel 15.

23 designates a spiral spring one end of which is attached to the spindle 20 and the other end of which is affixed to the casing 24 at 25. Above this spring and affixed to the spindle 20 is a cam 26 which is provided with a plurality of depressions 27 into which the springs 28, 28 are arranged to press. These springs are affixed to the casing 24. The cam 26 and its engaging springs 28, 28 form a non-positive stop-device for holding the spindle 20 against turning under the action of the spiral spring 23.

30 designates the door proper which is made up of a

plurality of vertical strips 31, 31 which are constructed as shown with alternate projecting portions and recesses which are arranged to fit together. These parts are so formed that when the door is closed the surfaces of the door present an unbroken surface which is neat in appearance and which is practically air-tight. The outer strip 32 is somewhat wider than the others and may be provided with a latch 33. The various strips which comprise the door are held together by two or more hinge-straps 34, 34 which are pivoted together as at 35 at the lines of junction of the various strips. The various parts of these hinge-straps are securely attached to each of the strips so that they together form a firm support for the strips which comprise the door and hold the same from sagging. These hinge-straps may be set into the strips until their outer surfaces are flush with the surface of the door. They may then be finished to correspond with the finish of the door so that they will not detract from its appearance.

To the top of the outer strip 32 a supporting strap 36 is affixed, in which is pivoted a roller 37 which is arranged to run upon the track 17 and thus support the outer portion of the door. Fixed strips 18 are provided at either side of the door along its upper edge for the purpose of guiding it and holding the strips in proper position. Similar fixed strips 19 are attached to the door-post 11 and into the space formed between the strips the outer vertical edge of the door enters when the door is closed. A groove in the surface of the door-post itself may be provided for this purpose.

The operating spring 23 is arranged to be wound up when the door is closed and is of sufficient strength to cause the spindle 20 to be rotated and to wind up the door upon itself when the latter is released. To open the door it is therefore only necessary to unlatch it and to start it sliding, and the spring 23 and its connected parts will complete the operation. When the door is thus closed the vertical edge of the strip 32 will come into such a position as to make it flush with the outer edge of the door-post 12 so that the door itself is completely out of sight. A stop 38 may be fixed in the path of movement of the roller 37 to cause the door to stop in the proper position. A rim hook may be inserted in this outer edge of the strip 32 to enable one to get a hold of the door and to pull it outward.

As one end of the door is supported by the spindle 20 and the other end by the roller 37, and as the intermediate portions of the door are strongly connected to these supported ends by means of the hinge-straps 34, a comparatively light spring is sufficient to accomplish the opening of the door. Consequently, only a slight outward pull upon the edge of the door is necessary to close it. This construction with its attendant ease of operation is important as it overcomes in a simple manner one of the difficulties heretofore found in doors of this class.

As it is often desirable to leave the door in an intermediate or partially closed position I have provided the holding or non-positive stop device, the parts of which I have already pointed out. This comprises the cam 5 26 which is attached to the spindle 20 and its engaging springs 28. These springs, taking into the depressions 27 on the cam, will hold the spindle and the door against the action of the spring 23 in any position in which the door may be stopped by the person operating it. 10

The operation of opening or closing the door is not only very easy but almost entirely noiseless. On account of the special form of the strips and their method of interlocking with each other the door itself is air-tight and the fact that all of its edges are completely 15 surrounded makes the structure one which will not allow any air or other vapor to pass through when it is closed. The various parts may be covered with metal or may themselves be constructed of non-inflammable 20 material so that an efficient fireproof door may be made according to this invention.

The various parts of the door frame are so constructed as to form one complete self-contained structure so that the door with its door frame and operating mechanism 25 may be manufactured and put together and subsequently installed as a complete structure in any desired location. This construction is valuable for use in any place where it is desirable to economize in space and may be used to advantage in such places as hospitals 30 and schools on account of its noiselessness. When it is provided with a lock it is burglarproof, as the construc-

tion of the strips and the manner in which they are put together makes it impossible for these strips to be cut apart by a knife or other instrument in the manner in which this may be done in similar structures. 35

What I claim is.—

1. A door comprising a plurality of vertical strips engaging with one another, and hinge-straps pivotally connecting said strips together, combined with a stationary track, a roller upon the track and attached to the door, 40 said track and roller being arranged to support one end of the door, a spindle arranged to support the other end of the door, a spring arranged to rotate the spindle and to cause the spindle to wind the door upon itself to open the door, and a yieldable holding device automatically actuated by the movement of the door arranged to hold the door at any desired point along its path of movement 45 against the action of the spring.

2. A door frame comprising a hollow post, a door comprising a plurality of vertical strips engaging with one another and hinge-straps pivotally connecting said strips together, combined with a stationary track, a roller upon the track attached to the door, said track and roller being arranged to support one end of the door, actuating mechanism within the hollow post arranged to support and to 55 open the door, said mechanism comprising a spindle, a spring arranged to rotate the spindle, and a cam; and a spring arranged to take into the surface of the cam to hold the door at any desired point along its path of movement against the action of the actuating mechanism. 60

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEPH A. BENISCH.

Witnesses:

ELLA TUCH,
ERNEST W. MARSHALL.