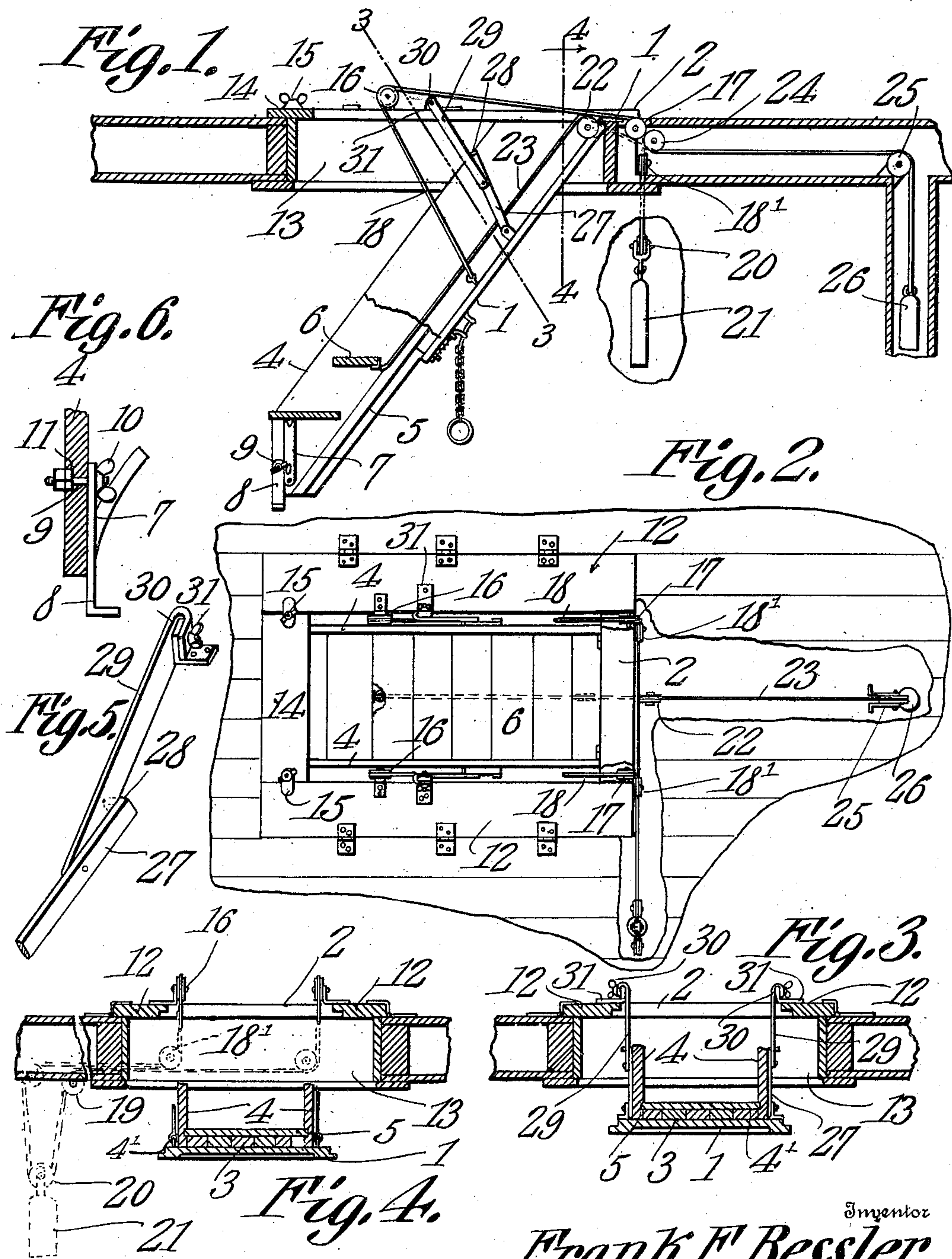


966,518.

Patented Aug. 9, 1910.



Witnesses

Witnesses
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UNITED STATES PATENT OFFICE.

FRANK E. BESSLER, OF AKRON, OHIO.

MOVABLE STAIRWAY.

966,518.

Specification of Letters Patent.

Patented Aug. 9, 1910.

Application filed September 20, 1909. Serial No. 518,554.

To all whom it may concern:

Be it known that I, FRANK E. BESSLER, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented a new and useful Movable Stairway, of which the following is a specification.

This invention has relation to movable stairways and it consists in the novel construction and arrangement of its parts hereinafter shown and described.

The object of the invention is to provide a simple structure in the form of a movable stairway especially adapted to be used in connection with attics although it may be used to advantage at cellar trap-doors and other places and the present structure is an improvement over that shown in Patent No. 897,870, issued Sept. 8, 1908.

With the above object in view the present structure includes a panel hingedly mounted and adapted to be used for closing a hatch or doorway and upon which is slidably mounted a set of stairs. Separate weights are operatively connected with the stairs and panel respectively and are adapted to counterbalance the parts or substantially so whereby the structure may be readily opened or closed as desired. A casing is provided which is adapted to be applied to the edges of the hatch or doorway and against which the panel is adapted to close and panel holders are pivotally connected together and are also connected with the said casing and the panel. Means is provided whereby the stairs may be secured in stationary or fixed position in case this should be desired and in case it would be desirable to remove or disconnect the panel holders from the casing referred to.

In the accompanying drawings,—Figure 1 is a side elevation of the movable stairway showing parts thereof in section and showing the floor structure of the building to which it is attached in section; Fig. 2 is a plan view of the movable stairway with parts of the floor of the structure to which it is applied broken away; Fig. 3 is a transverse sectional view of the movable stairway cut on the line 3—3 of Fig. 1; Fig. 4 is a transverse sectional view of the movable stairway cut on the line 4—4 of Fig. 1; Fig. 5 is a detail perspective view of the pivotally connected end portions of the panel holders; Fig. 6 is a detail sectional view of the lower portion of one of the stair risers.

A panel 1 is hingedly connected at its upper end with a cross piece 2 which is adapted to be secured to the floor of an attic adjacent a door or a hatchway and which forms a portion of a casing hereinafter to be described. Upon the upper side of the panel 1 is located a series of strips 3 which extend longitudinally of the panel and are preferably tongue and groove stuff laid in the manner similar to flooring. Upon the said strip 3 is placed a relatively thin strip or series of strips 4', the side edges of which project beyond the side edges of the outer strips 3 and the edge portions of which are spaced by means of the said strips 3 from the upper surface of the panel 1. The stair risers 4 are provided in the vicinity of their lower edges with grooves 5 which receive the projecting edge portion of the strips 4' and the lower edges of the said risers 4 bear against the upper side of the panel 1. The risers 4 are held at proper distances apart by means of the stair treads 6 which are joined to the said risers in the usual manner. Under the lower tread 6 is located brackets 7 which are also joined or connected with the risers 4 and the forward portion of the lower tread 6 projects beyond the forward edges of the said risers 4 in the manner as illustrated substantially in Fig. 1 of the drawing. Irons 8 are pivotally mounted upon bolts 9 which pass transversely through the risers 4. The said bolts 9 have winged heads 10 and at their threaded portions engage nuts 11 one of which is embedded in the outer side of each riser 4 and the other is screw-threaded upon the outer extremity of the nut 9 whereby a jam-nut structure is effected.

The casing of which the crosspiece 2 above referred to forms a component part also includes side-strips 12 which are hingedly attached to the floor of the attic adjacent the hatch or doorway 13. A crosspiece 14 is located at the end of the hatch 13 opposite that end to which the crosspiece 2 is applied and is provided with pivoted buttons 15 adapted to overlap the inner edges of the sidepieces 12 and hold the said sidepieces against swinging upon their hinge connections with the floor. By so connecting the parts of the casing together and locating them as described upon the floor of the attic adjacent the hatchway it is possible to move the end piece 4 with relation to the other pieces so the said end piece may be shifted

in case the casing structure should shrink and have a tendency to bind about the edges of the panel 1 or conversely should the said panel have a tendency to cause the pieces of which the said casing is composed to spread. Pulleys 16 are mounted upon the sidepieces 13 and pulleys 17 are journaled for rotation under the floor of the attic in the vicinity of the crosspiece 2; pulleys 18' are also journaled in the vicinity of the said pulleys 17. A cable 18 is attached at its ends to the panel 1 in the vicinity of the lower end thereof and then passes over the pulleys 16 from whence it passes over the pulleys 17 thence under pulleys 18' and over pulleys indicated at 19 in Fig. 4. Between the pulleys 19 the said cable 18 forms a loop upon which is mounted a sleeve 20 and to which is attached a weight 21. The pulleys 17, 18' and 19 may be of any desired pattern but are preferably of the same design usually employed for guiding sash cords.

A pulley 22 is journaled for rotation at the upper portion of the panel 1 and a cable 23 passes over the said pulley 22 and is connected at its lower end with one of the lower treads of the stairs (preferably the next tread to the lowest one as illustrated in Fig. 1). A pulley 24 is journaled under the floor of the attic as is also a pulley 25 and the cable 23 from the pulley 22 passes under the pulley 24 thence over the pulley 25 and has attached to its other end a weight 26 which is adapted to hang pendent in the space between the sides of a partition or other part of the structure of a house.

Arms 27 are pivotally connected at their lower ends to the side portions of the panel 1 approximately midway between the ends of the said panel and at their upper ends the said arms are provided with laterally disposed shoulders or lugs 28. Arms 29 are pivotally connected with the arms 27 at points intermediate of the said arms 27 and at their upper ends the arms 29 are provided with detachable bolts 30 which pass transversely through openings provided in lugs 31 mounted upon the side pieces 12 of the casing. The arms 27 and 29 are so connected together that it is impossible for them to assume alinement with each other but when the stairs and panel 1 are swung open with relation to the floor of the attic the said arms 27 and 29 are held at an angle to each other by means of the lugs 28 which engage the edges of the arms 27 and prevent the arms 27 from assuming alinement with the

arms 29. Thus it is comparatively easy to close the panel 1 against the under side of the casing of which the parts 2, 12 and 14 form component members for the reason that a knee or break-joint is established between the arms 27 and 29 and at the same time the arms 27 and 29 are so connected together as to relieve the upper portion of the panel 1 from excessive strain due to weight applied to the upper portion of the stair structure. When it is desired that the risers 4 shall be placed in fixed position with relation to the floor of the attic the arms 29 are disconnected from the lugs 31 by removing the bolts 30 and the angle irons 8 are swung down so that their lower ends rest upon the floor below the floor of the attic and the forward sides of the brackets 7 bear against the rear edges of the said angle iron 8.

Having described my invention what I claim as new and desire to secure by Letters Patent is:—

1. A movable stairway comprising a panel having a guide, a set of stairs mounted for longitudinal movement along the guide, a pulley journaled upon the panel, a cable operatively connected with the stairs and passing over the pulley and a weight hanging pendent from that end of the cable other than the end thereof which is attached to the stairs.

2. A movable stairway comprising a casing adapted to be applied to a hatchway, a panel hingedly connected with the casing, a set of stairs slidably mounted upon the panel, a pulley journaled upon the panel, a cable passing over said pulley and connected at one end with the set of stairs, a weight hanging pendent from the other end of said cable, arms pivotally connected together at their inner portions and at their outer ends pivotally connected with the casing and the panel respectively, a cable connected at its ends with the panel at a point between the said arms and the free end of the panel, pulleys mounted upon the casing over which the last said cable passes said cable having its intermediate portions formed in a loop from which a weight hangs pendent.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

FRANK E. BESSLER.

Witnesses:

JOHN S. MOLONEY,
W. H. COLLINS.