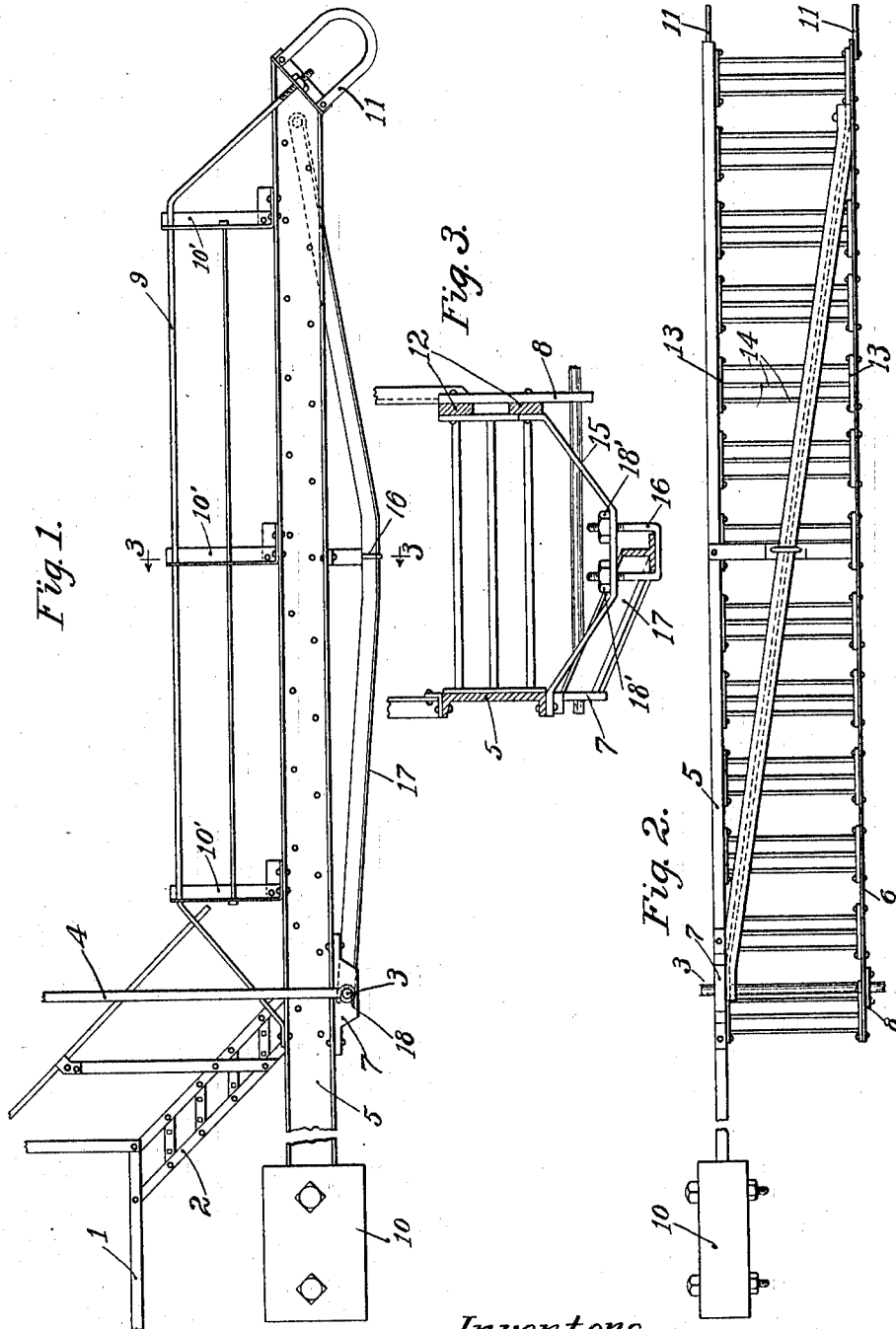


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COUNTERBALANCED STAIR.
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UNITED STATES PATENT OFFICE.

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COUNTERBALANCED STAIR.

1,059,272.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, CHARLES HENRY BURCH and WAINWRIGHT BACOT GERVAIS, citizens of the United States, and residents of Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Counterbalanced Stairs, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

Our invention relates to counterbalanced stairs such as are associated with the platforms of fire-escapes, at a convenient distance above the ground, and its object is to provide an improved stair wherein the proper relation of the parts is maintained by providing improved means whereby distortion or sagging of the parts of the structure, due to unbalanced strains, is prevented. It is usual in the art in the construction of stairways of this kind to mount two parallel side beams or stringers upon a suitable pivot rod and to secure suitable treads or steps between these side beams or stringers. The stair structure thus formed extends in but one direction from the pivot rod, which pivot rod usually extends from the side of the building, and in order to counterbalance the stairway to keep it normally off the ground in a horizontal position, a bar secured to one of the stringers is extended beyond the pivot rod in the opposite direction and is provided with a weight. Since but one of the stringers is thus counterweighted, and since the whole stairway is held up in this manner, it follows that there will be a tendency for the uncounterweighted stringer to sag out of parallel alinement with the other stringer. This has been found to be the case whenever provision against such sagging is not made.

The means for supporting the uncounterweighted stringer of the counterbalanced stair of our invention supports the said stringer without causing or allowing the stairway to buckle or twist, as has often been found to be the case when the braces and other devices heretofore proposed have been used.

Our invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevational view of a counter-balanced stairway embodying our

invention; Fig. 2 is a view showing the arrangement of our improved supporting means underneath the stairway; and Fig. 3 is a cross-sectional view taken on the line 3—3 of Fig. 1.

At 1 we have shown an ordinary fire-escape platform with a short stationary stairway portion 2 extending downwardly therefrom. At the bottom of this short stationary stairway is located the pivot rod 3 which may extend from the side of a building with which the counterbalanced stairway is associated, or it may be carried by any suitable supporting means indicated at 4. Upon this pivot rod 3 are mounted the stringers 5 and 6 by means of suitable bearings 7 and 8 carried by the stringers 5 and 6 respectively. The stringer 5, which is preferably a channel iron, extends rearwardly beyond the pivot 3 and has secured thereto the weight 10. As shown in Fig. 1 the pivot rod is located below the center of gravity when the stairway is in its horizontal position. When the stairway is in its lowered position, however, the center of gravity is below the pivot rod. Thus when the stairway is lowered it will remain in that position. When it is raised to its horizontal position it will be there held by the counterweight. The stringer 6 does not extend rearwardly beyond the pivot rod 3 any considerable distance. The stringers may be provided with suitable railings 9 carried by the supports 10', and the front of the stringers may be supplemented by struts 11; with these features, however, our invention has nothing to do.

The stringer 6 consists of two parallel pieces 12, 12, this arrangement being employed for the purpose of lightness, and between the two stringers the treads 13, 13 are secured. The stringer 5 may, if desired, be formed of two parallel pieces as is the stringer 6, but we have found that the metal saved by so doing is not sufficient to repay for the labor necessary to construct the other form of stringer. As illustrated in the drawings, each of the treads comprises two end pieces 13', 13' and a plurality of connecting rods 14, 14.

We find that if the stringer 5 is a single bar as shown in the drawings, a much more rigid stairway is had than if the said stringer were a fabricated structure having

secured thereto a bar to which the counterweight is secured.

We will now proceed to describe the improved means which we have provided for supporting the uncounterweighted stringer.

At substantially the middle of the counterbalanced portion of the stair is located a transverse cambered bar 15 bolted to the stringers 5 and 6. This bar 15 at its middle and lowest point, carries a saddle 16, as clearly shown in Fig. 3. A bent supporting bar 17 slotted at one end as shown at 18 is passed through the saddle 16 and the slotted portion fitted over the pivot rod 3 inside and against the bearing 7, as shown. The other end of this bent supporting bar is bolted to the stringer 6 at its free end. As is shown by the drawings, the stringer 6 is prevented from sagging by the bent bar 17, which is bent in the form of an arch and therefore forms a very strong brace for the stringer 6. The transverse supporting bar 15 engaging the off-set portion of the bar 17, serves to retain the said bar in proper position at all times. The bent bar 17 may be raised by tightening the nuts 18, 18, thereby raising the saddle 16. This raising of the bent bar 17 serves to exert a strain upon the free end of the stringer 6, thereby serving to support the same. An advantage of our improved supporting means is that the strain exerted upon the end of the stringer 6 is largely in an upward direction, there being little if any strain tending to cause the stairway to twist or buckle.

It will be readily seen that our bent supporting bar 17 may be raised at any time by tightening the nuts 18, 18, thereby exerting an increased strain upon the free end of the stringer 6. While we have shown the member 17 in the form of a T-bar, this being the preferred form, it should be understood that this bar may be of any suitable conformation without departing from the spirit of our invention.

While we have shown our invention in the particular embodiments herein disclosed, we do not, however, limit ourselves to the exact constructions shown, but may employ any equivalents that will suggest themselves to those skilled in the art.

What we claim is:

1. In a counterbalanced stairway, a pair of stringers hung upon a pivot, treads carried by said stringers, a weight carried by one of said stringers, a bent truss bar extending diagonally of the stairway to aid in the support of the other stringer, a strut carried by said stairway and extending be-

low the same and engaging said bent truss bar at substantially its middle point, and means carried by said strut for adjusting the amount of bend of said bent truss bar.

2. In a counterbalanced stairway, a pair of stringers hung upon a pivot rod, treads carried by said stringers, a weight secured to one of said stringers, a bent supporting bar having a bifurcated end fitting over said pivot rod, said bent supporting bar extending diagonally of the stairway and secured to the free end of the unweighted stringer to aid in the support of the same, and means carried by the stairway exerting upon said bent supporting bar a stress tending to straighten the same, a bifurcated end of said supporting bar being adapted to turn upon said pivot rod as the amount of bend of said supporting bar becomes less.

3. In a stairway, a pair of stringers hung upon a pivot rod, means for holding up the free end of said stairway applied to one of said stringers, a bent supporting bar extending diagonally of said stairway, said bent supporting bar being positively secured to the free end of the other one of said stringers and being pivotally mounted upon said pivot rod, and means carried by said stairway engaging said bent supporting bar and exerting thereon a stress tending to straighten the same.

4. In a stairway, a pair of stringers hung upon a pivot rod, means for holding up the free end of said stairway applied to one of said stringers, a truss member consisting of an integral bent supporting bar extending diagonally of said stairway to aid in the support of the other stringer, and adjustable means carried by the stairway engaging said bent supporting bar and exerting a stress thereon tending to straighten the same.

5. In a stairway, a pair of stringers hung upon a pivot rod, means for holding up the free end of said stairway applied to one of said stringers, a truss member consisting of an integral bent supporting bar extending diagonally of said stairway to aid in the support of the other stringer, and an adjustable strut carried by the stairway exerting upon said bent supporting bar a stress tending to straighten the same.

In witness whereof, we hereunto subscribe our names, this 13th day of June, 1912.

CHAS. HENRY BURCH.
WAINWRIGHT B. GERVAIS.

Witnesses:

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WALTER H. BARRY.