N. AMES.

REVOLVING STAIRS.

25,076. Patented Aug. 9, 1859.

Fig 1.

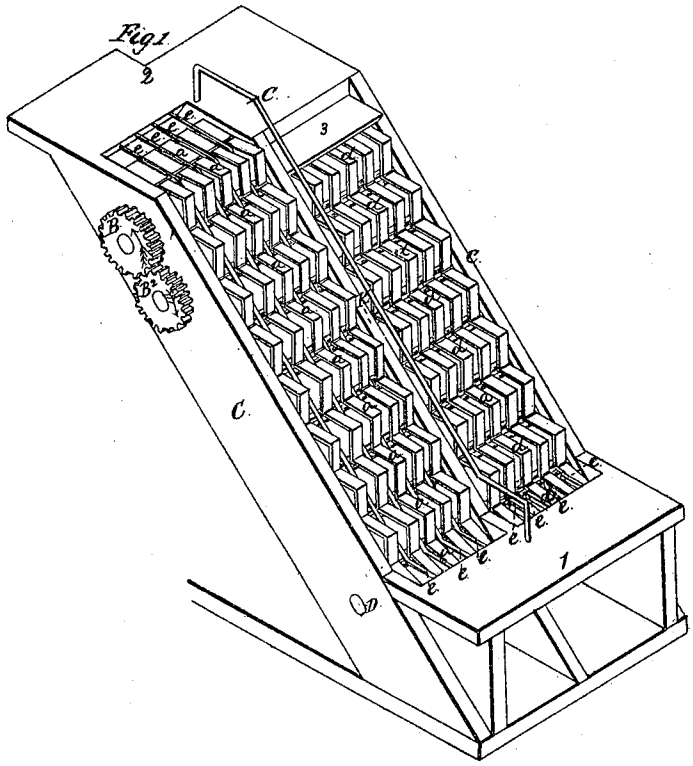


Fig 2.

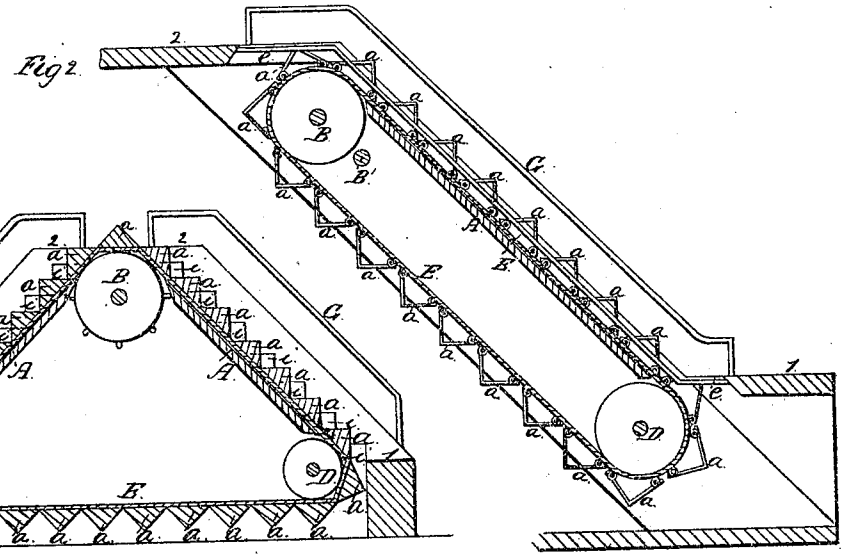
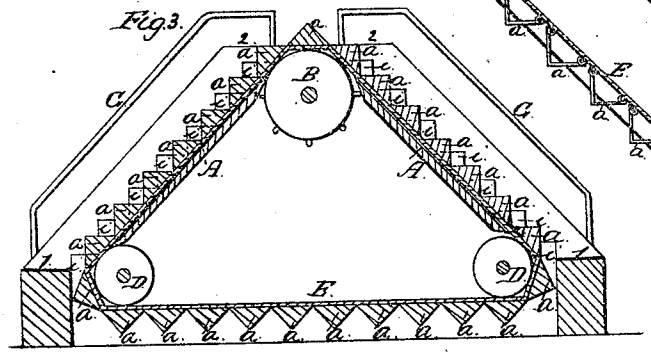


Fig 3.



Witnesses.
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REVOLVING STAIRS.

Specification of Letters Patent No. 25,076, dated August 9, 1859.

To all whom it may concern:

Be it known that I, NATHAN AMES, of Saugus, in the county of Essex and Commonwealth of Massachusetts, have invented a new and useful Improvement in Stairs, which I call Revolving Stairs; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, forming a part of these specifications, in which—

Figure 1 represents a perspective view of the double parallel arrangement of stair flights, the two flights being placed side by side, and moving in opposite directions. Fig. 2 represents a side sectional elevation of the double parallel arrangement. Fig. 3 represents a side sectional elevation of the triangular arrangement of a single, or continuous stair flight, in which the same object is attained as by the arrangement shown in Fig. 1.

Like parts are indicated by the same letters in all the figures.

The nature of my invention consists in arranging steps, or stairs, upon an inclined endless belt, chains, or ropes, or in attaching the stairs or steps together by links or joints so as to form an endless inclined flight of steps or stairs, which are placed on, over, or around, rollers, so that the stairs or steps shall serve as elevators, when motion is transmitted to the rollers.

The object of the invention is to enable persons to ascend and descend from one story of a building to another, without exerting any muscular strength; the stairs being also capable of being used in the ordinary way, when desired.

In the double parallel arrangement, as shown in Fig. 1, the two flights are placed side by side, and secured in any proper framing and between mop, or side-boards, C, K, C. The stairs, or steps, *a* and *d*, are secured to an endless belt E (see Fig. 2) which passes over rollers, B and D, and rests upon an inclined support, A, in the framing.

In place of an endless belt, it is evident that chains or ropes may be used; or the ends of the stairs may be connected together by joints or links forming a continuous flight of stairs to travel around the rollers.

The stairs may be constructed of wood or metal, and of the usual form, and, when arranged as shown in Figs. 1 and 2, may have an inclination of 45°, more or less as circumstances may require. When arranged as shown in Fig. 3, the stairs should have an inclination of 45° exactly.

In the parallel arrangement, the lower ends of the flights pass around, each on a separate roller turning on the axle, D; while the upper ends of the flights pass around rollers whose axles are actuated, and connected, by gear wheels, B, and B′, which are revolved in the directions indicated by the arrows; B carrying the ascending stairs, *a*, and B′ carrying the descending stairs, *d*. It is also obvious that the two flights may be disconnected; or only one flight may be used either for ascending or descending.

1 represents the first story, and 2, the second; though the same arrangement may be extended, if desirable, through several stories.

G is a stationary balustrade secured either to the center mop board, as shown in Fig. 1, or to the sides, C C, in the usual manner.

To the framing, or platform of the stairs, on its upper side, longitudinal rods, *e*, *e*, *e*, *e*, *e*, are attached, extending the whole length of the flight, and fitting into slots, or recesses in the stairs, as clearly shown in Fig. 1. The upper and lower ends of the rods are in a horizontal position, and form, in the ascending flight, gratings, or platforms, on which persons may stand and through which the steps may ascend and descend; the grating at the lower platform forming a convenient means to receive the feet of persons desiring to be elevated, while the upper grating in turn receives their feet, and allows the stairs or steps to pass down on the opposite side.

It may not be absolutely necessary to have the rods, *e*, extend the whole length of the flights, but, as seen at the foot of the descending flight, short rods alone may suffice; in either case, however, the stairs, or steps, must, of course, be slotted. In the descending flight, a grating is not necessary at the upper end, as a person steps down from off a stationary step, 3, on to a stair of the flight.

The rods, *e*, should be sufficiently close together, so as to preclude the possibility of the feet of a person passing between them.

i i i (as shown in Fig. 3) are stationary

supplemental steps, attached to the framing by the side of the revolving flights. These supplemental steps may extend the whole length of the flights, or a few only may be used. Their object is to enable a person to step on and off the revolving stairs, at any point in the path of their movement; and they will be convenient in case of the revolving stairs passing directly through two or more stories of a building. If a single landing or platform only was used at each story, a person, failing to leave the revolving stairs at the proper instant, might be carried upward and beyond the landing; but by having two or more stationary steps at each landing, such a contingency would not be likely to occur.

Fig. 3 represents the triangular arrangement, in which both an ascending and descending flight of stairs is obtained by one continuous flight of steps. The stairs are attached to an endless belt, E, or its equivalent, or hinged together, in the same manner as explained in Figs. 1 and 2. The rollers, B, D, D, are attached at each corner of a triangular framing, as shown in the figure. In this triangular arrangement, it will be necessary to have the sides of the framing, A, A, at an angle of 45°, for the stairs, *a*, serve as elevators on one side and as a descending flight on the other; consequently the parts of the stairs, that form the "risers" at one side, form the "treads" at the opposite side, and vice versa. It is essential, therefore, that each step, *a*, be formed of two equal parts at right angles to each other.

In the triangular arrangement, the "risers" and "treads" should be equal; but in the parallel arrangement the "risers", if desirable, may be longer than the "treads." The steps may also be covered or cushioned over, or made of some softer material than wood and rounded at the corners.

If the stairs are made of metal and open at the bottom, as in Figs. 1 and 2, the belt in passing over the rollers will hug them close; but if the stairs are of wood, or closed at the bottom as in Fig. 3, the belt will not fit close to the rollers, unless the latter are made polygonal, the sides conforming to the bottoms of the steps. Or the bottoms of the steps may be concave so as to conform exactly to the circumference of the rollers.

In large public buildings it would perhaps be desirable to have steam power applied to the revolving stairs, and have the same kept constantly moving at a moderate speed. In private dwellings, where the stairs would be revolved only occasionally, they might be operated by hand power, or by a weight applied to the stairs through any suitable mechanism. In private residences, they would prove valuable in assisting the sick, aged, and infirm from story to story; they would also prove a luxury to those that are active and in health, especially if the house be large. Thus by rendering the upper stories of large buildings comparatively easy of access, their value will be greatly enhanced, especially in large and densely populated cities, and buildings may be constructed much higher than heretofore, as the previous objections to such structures will be obviated.

When not in motion, it is obvious that my stairs are as convenient as the stairs in common use, and may be employed in every instance as a substitute. It is also evident that a person may, if he chooses, walk upon the stairs while they are in motion, and thereby ascend, or descend, as the case may be, with double speed.

What I claim as my invention and desire to secure by Letters Patent, is—

1. Arranging steps, or stairs, upon an endless belt, or in any manner equivalent, and placing them over rollers, substantially as described, so as to form a revolving flight of stairs which may be used both as a common flight and as an elevator.

2. The triangular arrangement of the stairs as shown substantially in Fig. 3, whereby an endless flight is made to pass around three rollers, B, D, D, for the purpose described.

3. The double parallel arrangement, as shown substantially in Figs. 1 and 3, whereby ascending and descending flights are placed side by side.

4. The use of auxiliary stationary steps, or stairs, to operate in connection with the revolving stairs, substantially as, and for the purpose, set forth.

5. The employment, or use, of rods, or slots, to operate in connection with the slotted stairs, substantially as described and for the objects specified.

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