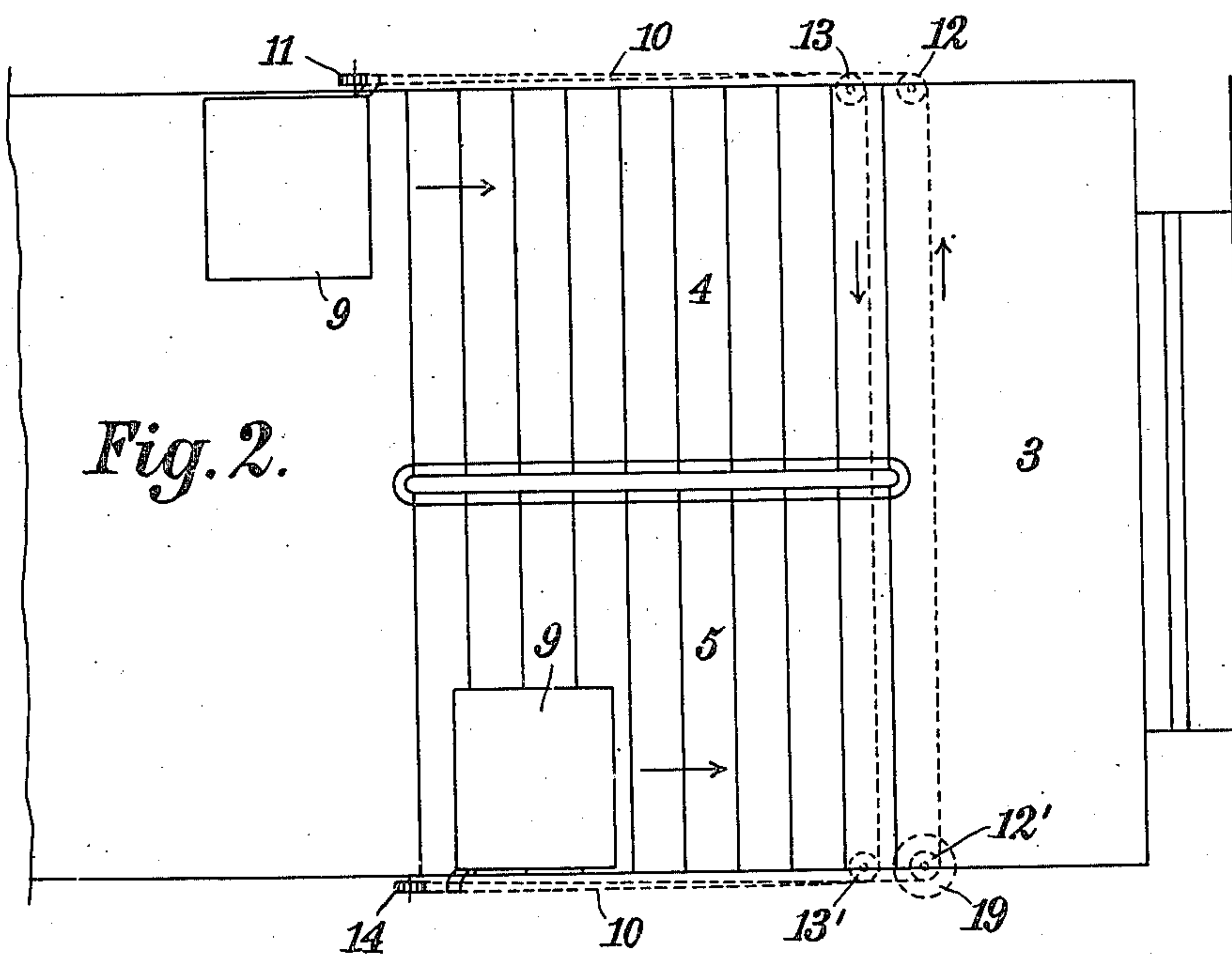
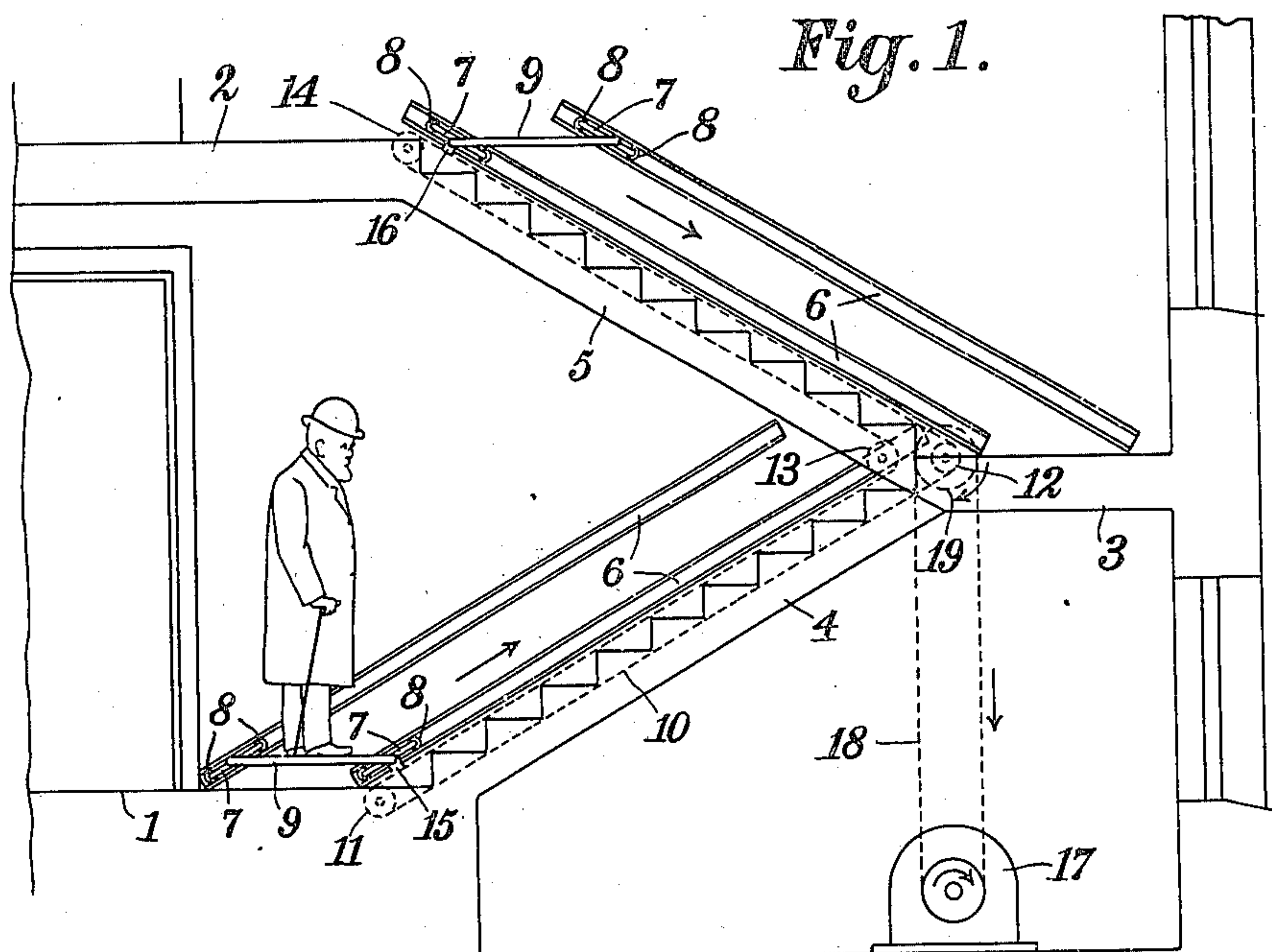


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LIFT.
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LIFT.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ALEXANDER GAVRYLOFF, a subject of the Czar of Russia, and residing at Warsaw, Russia, have invented certain new and useful Improvements in Lifts, of which the following is a specification.

My invention relates generally to lifts and particularly to lifts arranged alongside staircases.

In order to be able to convey persons or objects into the various stories in a house, either lifts movable solely vertically are employed, provision for which, if they are not located outside the house, must be made when building the house, or so-called movable stairs may be employed which are arranged in the form of endless belts or in the form of steps on endless belts and convey persons along an inclined plane from one story to the next. This form also necessitates provision when building the house, however, and is otherwise only of practical importance when a large number of persons have to be conveyed constantly in the same direction, *e. g.* upward. On the other hand, this known form has the material disadvantage that it is impossible to arrange ordinary fliers simultaneously.

In contradistinction to these known means, a primary object of my invention is to provide a lift for persons or goods which above all can be arranged in existing houses and which is formed in such manner that the ordinary staircase can be employed while the lift is at rest or in use. To this end, I provide in each story in the stairway slanting rails, preferably two in number, which may be suitably secured either to the wall of the stairway or to the banisters and which serve for supporting and guiding platforms occupying only a part of the breadth of each stair, so that laterally of these platforms the ordinary flier can be used as formerly. These platforms are moved by a suitable source of power, which can rotate as desired in opposite directions, in such manner that a platform is driven firstly upward, for example, and then downward into its original position.

In stairways in which the two stories are connected by way of an intermediate landing I preferably provide two platforms which are moved relatively in such manner that, when driven from the source of power, each is conveyed only to the landing, the one

platform going up when the other is moved down, and reversely. This can be effected in simple manner by connecting the two platforms by an endless belt, chain or the like, and moving this connecting member so that the platforms are moved as described. In this manner it is possible that the user who, when entering the stairway, finds the platform at such a height that it can be used, can mount it and be raised to the first landing. In consequence of this motion the platform of the next higher story has been moved downward and now is at the height of the landing, so that after leaving the first platform the user can go over the landing to the second platform and be conveyed by it to the next story. During this upward movement of the second platform the first returns into its original position, and so on. It is nevertheless to be noted that such a lift is not limited to zigzag flights of stairs interrupted by one or more landings, but may be used in similar manner in connection with spiral staircases and similarly shaped stairways without departing from the spirit and scope of my invention.

One illustrative embodiment of my invention is represented by way of example in the accompanying drawings wherein:—

Figure 1 is a diagrammatic elevation showing a stairway containing a lift according to my invention, and Fig. 2 is a top plan view of the same.

Referring to the drawing, 1 denotes one story, 2 a higher story, 3 an intermediate landing, 4 a flight of stairs connecting story 1 with landing 3, whereas another flight of stairs 5 leads from the landing to story 2. A number of U-rails 6 are secured to a suitable part of the stairway, for example to the masonry walls of the same or to the banisters of the staircase. In the drawing two such parallel rails are used for each flight 4 and 5 and are arranged at the same inclination as the staircase. In the groove of each rail 6 runs a small car 7 having rollers 8 and the two cars 7 of each flight are connected one with the other by a horizontal platform 9, the platform being of stiff construction and rigidly secured to the cars. This is preferably of such size that one or more persons can conveniently stand thereon. In breadth it is preferably only a fraction of the breadth of the stairs, as clearly shown in Fig. 2. Consequently the flights 4 or 5 can be utilized as before in the usual

manner. Obviously, in certain instances, platform 9 may occupy the entire breadth of the stairs, but then the latter can only be used when the lift is not in operation. Further, at suitable parts of the stairway an endless chain, rope, cord, belt or similar transmission member 10 is arranged which runs over a pulley 11 in the neighborhood of story 1, passes over pulleys 12, 13 at the landing 3 and finally runs over pulley 14 at the second story. To this chain or the like is secured at 15 the bottom platform 9 and at 16 the top platform 9 so that, when the endless member 10 is moved, the two platforms 9 must participate simultaneously in its motion, and when the bottom platform moves upward as indicated by its arrow, the top platform must move downward as indicated by its arrow, and reversely. This chain or rope 10 may be driven in any suitable manner, for example a motor 17 of any kind, which, however, can be rotated as desired in the one or other direction, may be arranged in the cellar.

By means of a belt, chain, rope, cord or the like 18 motion is imparted by the motor to a wheel 19 secured on the axle of roller 12. If the chain or rope 18 is moved by motor 17 in the direction of the arrow in Fig. 1, the bottom platform 9 is moved upward and the top platform 9 simultaneously downward.

If motor 17 be an electric motor for example, this may be started by the user on mounting the bottom platform 9 by moving a switch secured to the wall or other suitable place so that motor 17 is fed with current in the corresponding sense and rotated as required. When the bottom platform 9 is at the height of landing 3 the motor can be cut out of circuit and both platforms stopped by a switch influenced by the motion of platform 9. When changing from the one platform to the other at landing 3 the user then has to actuate a switch secured to the wall by which, for example, the current is now sent through the motor in the opposite direction, whereby the platforms are moved in the reverse direction, in order to convey the user to the second story. Instead of an electric motor, it is to be understood that a hydraulic motor or other engine or prime mover may be used, and consequently the same may be controlled either by mechanical means comprising lever, rod or rope transmission, or by influencing piping for liquids, gas and so on. The switches may be arranged not only on the wall but also in suitable manner directly on the platform without departing from the spirit and scope of my invention. Also, the means for moving the platform which in the illustrative embodiment comprise an endless member 10 for transmission of power may be formed otherwise.

In the above it has been assumed that motor 17 is rotated at any time only when the lift is to be operated, which without doubt assures economical working. In the case of great traffic, however, two motors 17 may preferably be used which constantly run in opposite directions, when the motions of these motors will be transmitted to the corresponding platforms or to the transmission member 10 by connecting or disconnecting suitable clutches which may be actuated electrically, pneumatically, hydraulically, mechanically and otherwise. Preferably, the construction is, of course, such that only one or two motors arranged in the cellar drive all the lifts in one stairway.

It may be pointed out that it is not absolutely necessary to bring two lifts into the positive relation shown in the drawing in such manner that they are constantly influenced in common in pairs; on the other hand each platform may be moved independently of the others. But it is essential that the form be such that a mechanical lift can be made without material alterations in existing stairways and, under certain circumstances, in such manner that the staircase can still constantly be used as before. Lastly, the platform may also be formed folding longitudinally or transversely.

In the above description I have assumed that the platforms move either individually or two connectedly only in one direction up to a certain height and then, in order to return, have to be driven afresh by influencing a switch or like means. It will be readily understood that it is possible to arrange that, when a platform has been moved to the desired elevation at any time and the passenger carried thereby has left the same, the platform returns at once into its original position for example by a switch being operated which reverses the motor circuit when the platform reaches a desired elevation. Also, by the passenger leaving the platform a switch could be actuated and thereby cause the platform to return. Lastly, it is obvious that a platform may be moved not only from one story to the next landing or to the next story, but also the entire height of the stairway when the shape of the staircase is suitable, without departing from the spirit and scope of my invention.

I claim:—

1. The combination, with a stairway and a staircase therein, of rails arranged parallel with and laterally of the staircase, a platform movable along said rails, the breadth of said platform being a fraction of the breadth of the stairs, and means for reciprocating said platform along said rails, both of said rails being located on the same side of the stair case.

2. The combination, with a stairway and a staircase therein, of rails arranged parallel

with and laterally of the staircase, two platforms movable along said rails, the breadth of each platform being a fraction of the breadth of the staircase, and means for driving said platforms up and down said rails, both of said rails being located on the same side of the stair case.

3. The combination, with a stairway and a staircase therein, of rails arranged parallel with and laterally of the staircase, two platforms positively connected with one another and movable along said rails, the breadth of each platform being a fraction of the breadth of the staircase, and means for driving one of said platforms upwardly and the other of said platforms simultaneously downwardly, both of said rails being on the same side of the platform.

4. The combination, with a flight of stairs, of two U-rails parallel therewith and arranged laterally thereof, a car movable along said rails, an endless transmission

member attached to said car, and a motor for driving said member, both of said rails being on the same side of the car.

5. The combination, with a stairway and a staircase therein, of rails arranged parallel with and laterally of the staircase, one or more platforms movable along said rails, the breadth of each platform being a fraction of the breadth of the stairs, means for driving each platform from its normal position along said rails, and means for automatically returning each platform into its normal position, both of said rails being on the same side of the stair case.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

ALEXANDER GAVRYLOFF.

Witnesses:

CYRIL TREDWICKI,
THOMAS MILES.