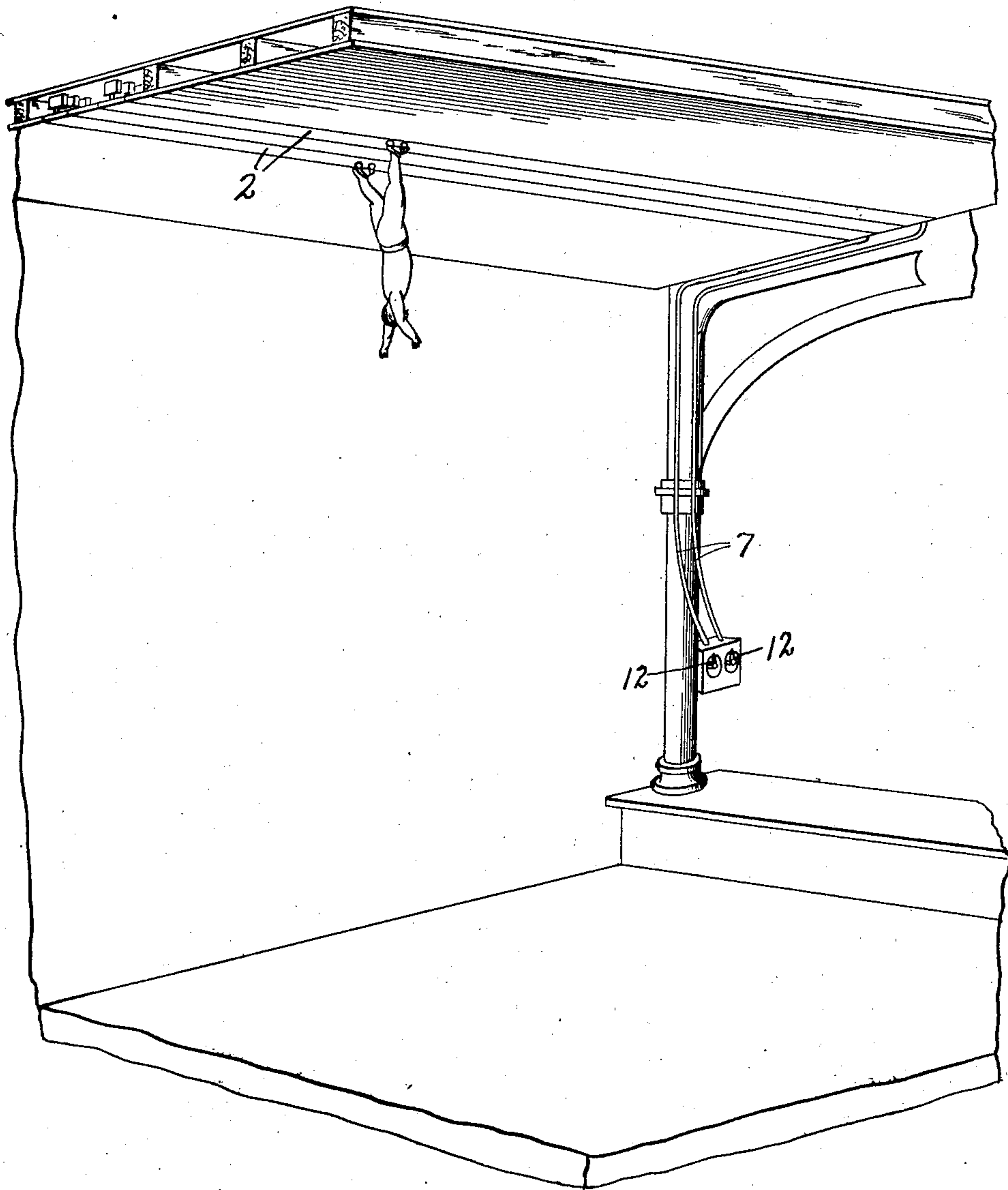


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ELECTRIC AERIAL AMBULATING SYSTEM.  
APPLICATION FILED SEPT. 24, 1907.

915,171.

Patented Mar. 16, 1909.  
2 SHEETS—SHEET 1.

*Fig. 1.*



*Witnesses.*

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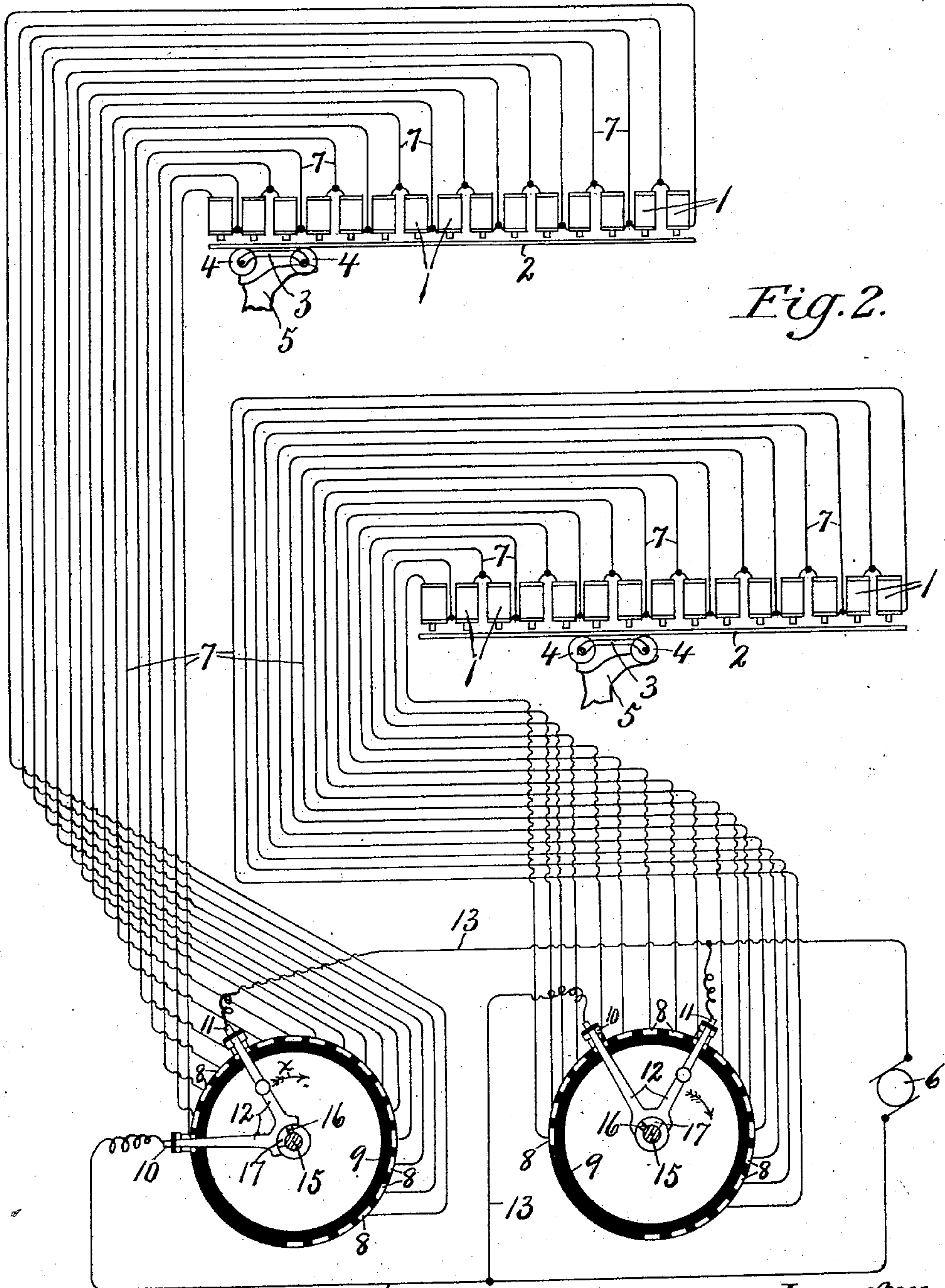


Fig. 2.

Witnesses.  
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# UNITED STATES PATENT OFFICE.

ERNEST F. GEORGE, OF MANLIUS, NEW YORK.

## ELECTRIC AERIAL AMBULATING SYSTEM.

No. 915,171.

Specification of Letters Patent.

Patented March 16, 1909.

Application filed September 24, 1907. Serial No. 394,362.

*To all whom it may concern:*

Be it known that I, ERNEST F. GEORGE, of Manlius, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Electric Aerial Ambulating Systems, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

10 This invention relates to certain improvements in apparatus for aerial ambulation, and refers more particularly to a system of electro magnetic devices and controlling means therefor whereby a person may safely walk, slide or skate in an inverted position along the underside of a ceiling or other aerial support to which this system is applied.

20 I am aware that some feats have been accomplished by the use of pneumatic vacuum pads or vacuum cups attached to the feet of the actor and adapted to be forced against the flat underside of an overhead support to sustain the actor by suction or vacuum.

25 The object of my present invention, however, is to sustain the actor solely by electro magnetic means under the control of suitable circuit closers, whereby such actor may easily shift position by walking, sliding or skating along a suitable track or plate within the field of the electro magnetic devices. In other words, I have sought to install in the ceiling or other available overhead support a plurality of series of magnetizable elements, usually arranged in parallel rows of considerable length and concealed by underlying plates or conductors along which are movable suitable armatures adapted to be fastened to the feet or hands of the actor, and which are shiftable or movable at will along the tracks or plates.

35 A further object is to provide means for energizing the magnetizable elements in sections and according to the positions of the armatures as they are shifted by the actor so as to conserve the current energy required, thereby localizing or concentrating practically the entire energy within the magnetizable sections within the immediate sphere or locality of the foot or armature attached thereto.

Other objects and uses will be brought out in the following description.

45 In the drawings—Figure 1 is a perspective view of a portion of the auditorium and proscenium of a theater showing the application

of my invention. Fig. 2 is a diagrammatic view of an electro magnetic ambulating system embodying the various features of my invention, and comprising essentially a plurality of series of electro magnets —1— which in this instance, are arranged in parallel rows, and associated with each series is an underlying metallic plate —2— of any material through which the magnet force may pass and constituting a track along which are movable separate armatures —3— carrying rollers —4— and adapted to be fastened to the feet, as —5—, of the actor. The magnets of each series are electrically connected in series and are energized from a suitable source of electric energy, as a dynamo —6—. The electro magnets of each series are electrically connected consecutively from one end by separate conductors —7— to metallic segments —8— which are arranged consecutively in circular series around and upon a suitable supporting medium —9—.

Each supporting medium —9— and its segments 8, constitutes what may be termed a "commutator," around which is movable a pair of electric contact pieces —10— and 11—. I preferably provide two of these commutators, one for each series or row of electro magnets, and with each commutator is associated a pair of contact pieces —10— and 11— which are mechanically connected and held a fixed distance apart by a suitable yoke 12— so as to span a predetermined number of, in this instance, five segments —8—. These contact pieces —10 and 11— are movable simultaneously around and in contact with the several segments of each particular commutator and are electrically connected by conductors —13 and 14— to opposite poles of the dynamo —6—.

Each of the contact pieces 10— and 11— is arranged to contact with one or adjacent segments —8— at a time, and it therefore follows that if these segments are successively connected to consecutive electro magnets and the contact pieces —10— and 11— span or embrace a definite number of segments, a corresponding number of electro magnets minus one in electrical connection therewith will be simultaneously energized and that if the yoke 12— is shifted from its starting position shown in the direction indicated by arrow —X—, the contact pieces 10 and 11— will be brought into successive engagement with consecutive segments of the commutator, but will always embrace



the same number, and thereby energize a corresponding, but consecutive number minus one of electro magnets which may be in electrical connection with the segments  
5 embraced by and between the contact pieces 10— and 11—.

The yokes 12— are substantially identical and are loosely mounted upon a shaft —15— with a limited lost motion, and associated  
10 with each commutator is an armature —3—; that is, I employ a pair of armatures one for each foot and a corresponding pair of controlling mechanisms, as the commutators —9— and shifting switch members 12—.  
15 These switch members are separately movable through limited arcs around their respective commutator segments, and are usually actuated by hand by an attendant located where he can easily witness the  
20 movements of the actor's feet with the armatures —3— thereon along the electrified track —2— so that as the actor moves first one foot, and then the other in advancing along each line of electro magnets the commutator switches 12— are correspondingly  
25 shifted alternately according to the foot which is to be advanced, thereby energizing only those electro magnets which are in the immediate vicinity of the foot, or armature thereon. In order that this may be successfully accomplished each yoke or switch element 12— is adapted to be moved through  
30 a limited arc, substantially equal to the space between the contact pieces 10— and 11— independently of the other yoke or switch element, and for this purpose the shaft 15— is provided with pins 16— each entering an elongated slot or recess 17— in  
35 the hub of the yoke 12— so that when one electro or switch element is advanced a limited distance through the arc previously described, the end of the recess encounters the pin 16— and thereby limits the movement of this yoke independently of the shaft  
40 whereupon the other yoke 12— may be similarly advanced through a similar arc independently of the first operated yoke before locking with the shaft through the medium of the pin 16—. If, however, the yoke  
45 12— should be moved beyond the limit of the lost motion it will simply rotate the shaft and thereby move the other yoke a corresponding distance, it being understood that the shaft 15— is rotatable independently of  
50 the commutators or disks —9—, which are stationary.

In operation, the actor places the armatures or roller skates provided therewith upon the feet and by means of a trapeze or  
60 other suitable support, assumes an inverted position with the armatures in contact with the plates or track-bars —2— and within the field of the electro magnets. Now, by properly adjusting or setting the contact  
65 pieces 10 and 11— of each commutator, and

energizing the magnets in the immediate vicinity of the armatures, said armatures will be attracted with sufficient electro magnetic force to sustain the actor without  
70 other supporting means, and the actor may shift or advance the feet with the armatures thereon one at a time along the tracks —2—, whereupon the attendant who carefully watches each move of the actor shifts  
75 the corresponding contacts 10— and 11— gradually into contact with successive segments of the corresponding commutator, thereby energizing successive electro magnets in the direction of movement of the foot, and magnetizing only those magnets  
80 which are in range with the armature and cutting all other magnets out of the circuit. For example, I have shown the armature as having a range to include a plurality of, in this instance, four electro magnets and the  
85 corresponding commutator contacts 10 and 11— are set or so relatively arranged as to include a corresponding number of segments which are in electrical connection with said magnets, and therefore, by connecting these  
90 contacts 10 and 11— to opposite poles of the electric generator —6—, it is evident that all of the electro magnets which are connected to the segments in contact with  
95 and embraced between the contact pieces 10 and 11— will be placed in circuit with the dynamo and thereby energized, and that by advancing these contacts around the commutator segments to correspond with the  
100 advance movement of the feet, the actor may safely slide, skate or walk along the tracks backward and forward at will.

The electro-magnets —1— are wound in series so that poles of adjacent magnets are opposed, that is one magnet represents the  
105 north pole and the next adjacent one the south pole and so on through the entire series thereby producing a maximum electro magnetic force or attraction with a minimum amount of current and it is clearly  
110 obvious that under this manner of electrical connection a few comparatively small magnets will sustain the weight of any ordinary actor.

What I claim is:

1. An aerial ambulating system comprising magnetizable mediums and energizing means therefor, in combination with armatures movable by the operator within the field of said mediums, and means for progressively energizing successive groups of  
120 said magnetizable mediums.

2. An aerial ambulating system comprising a plurality of series of magnetizable mediums and energizing means therefor, in combination with armatures movable along said  
125 mediums and means for progressively energizing said mediums in groups.

3. An aerial ambulating system comprising a plurality of electro magnets arranged  
130



progressively side by side and means for progressively energizing said magnets in groups, in combination with an armature movable by the operator within the magnetic field from magnet to magnet.

4. An aerial ambulating system comprising a plurality of electro magnets arranged progressively side by side an energizing means therefor in combination with an armature movable within the magnetic field from magnet to magnet, and means for concentrating the electric energy within a limited number of the electro magnets, and for shifting the current progressively through the entire series of electro magnets.

5. An aerial ambulating system comprising a plurality of electro magnets arranged side by side and energizing means therefor, a bar running along the entire side of and within the field of the electro magnets, an armature movable along said bar within the field of the magnets, and means for progressively shifting the energizing agent through the series of magnets.

6. An aerial ambulating system comprising separate rows of electro magnets arranged side by side, armatures movable along and

within the field of the magnets of both rows, and means for energizing limited numbers of the magnets of each row in sequence.

7. An aerial ambulating system comprising a plurality of series of electro magnets and a pair of metal plates each located in the field of the magnets of one series and constituting a track, armatures actuated at the will of the operator along and within the field of the magnets of both series, and means for successively energizing the magnets of each series.

8. In an aerial ambulating system comprising two rows of electro-magnets, those of each row being arranged in groups, means for progressively energizing the groups of magnets of each row, a track running under the pole pieces of the magnets, and rolling armatures movable by the operator along said track as the groups of magnets are progressively energized.

In witness whereof I have hereunto set my hand this 14th day of September 1907.

ERNEST F. GEORGE.

Witnesses:

GEORGE H. COLE,  
CHAS. E. COLE.