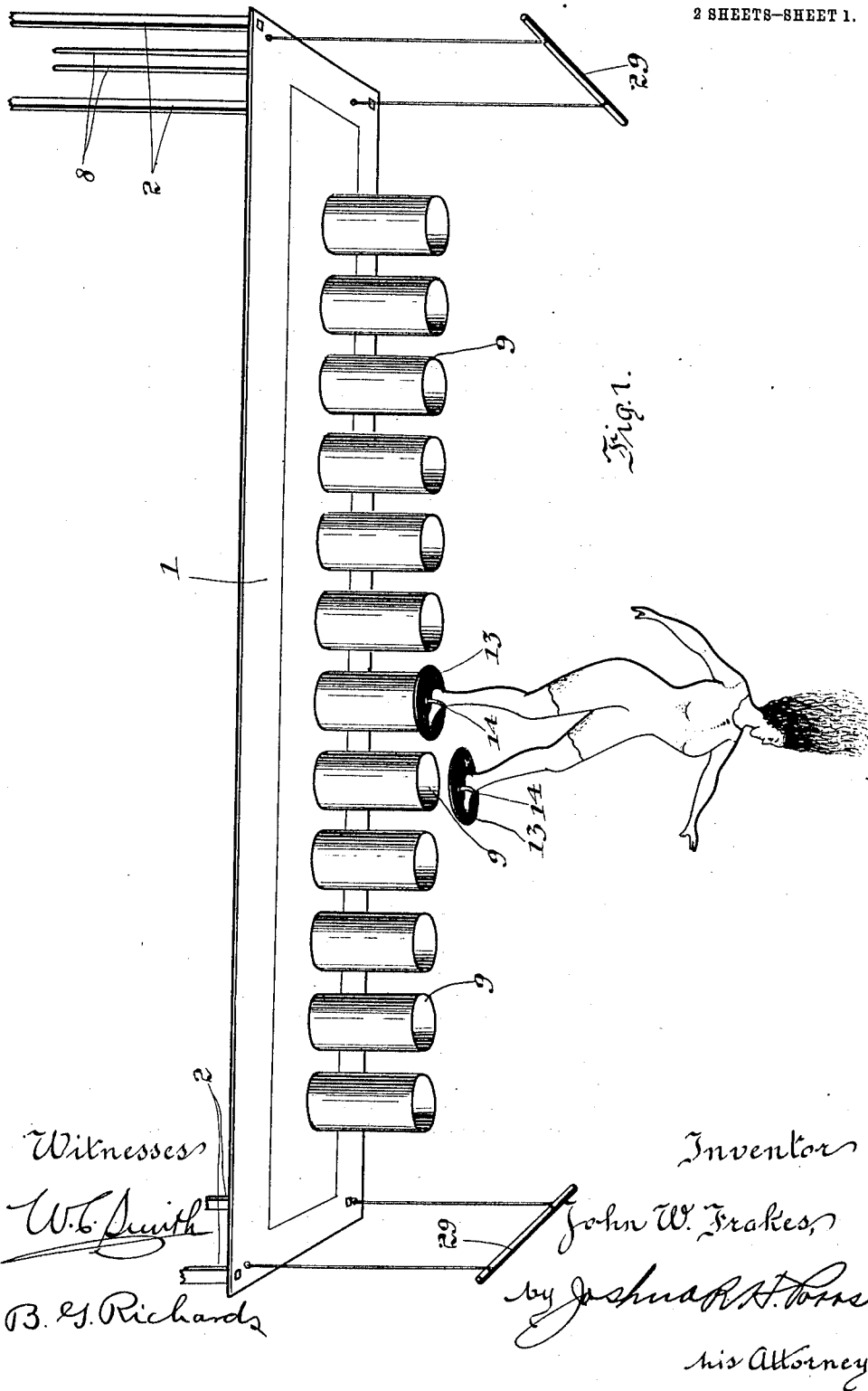


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THEATRICAL APPARATUS.
APPLICATION FILED SEPT. 22, 1911.

1,040,303.

Patented Oct. 8, 1912.

2 SHEETS-SHEET 1.

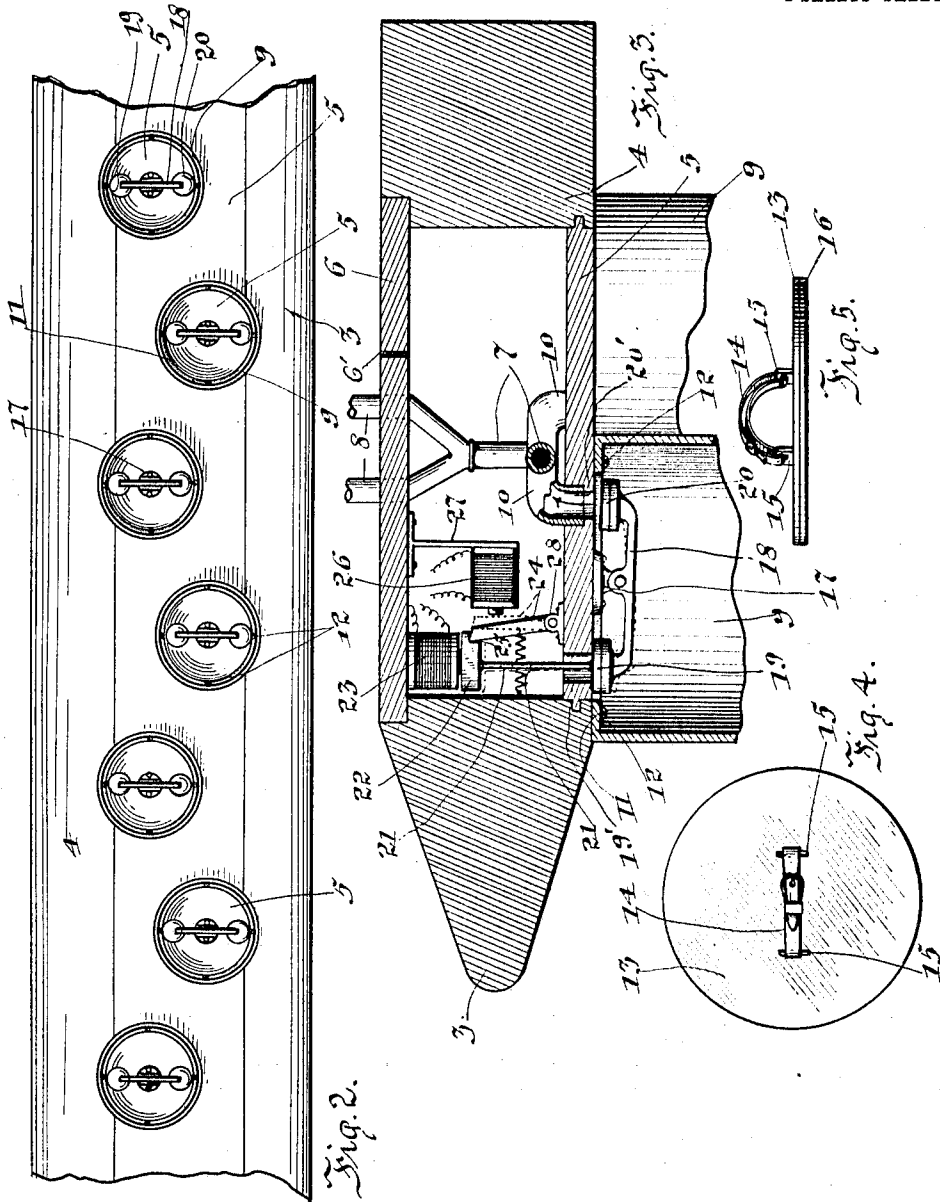


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THEATRICAL APPARATUS.

1,040,303.

Specification of Letters Patent.

Patented Oct. 8, 1912.

Application filed September 22, 1911. Serial No. 650,762.

To all whom it may concern:

Be it known that I, JOHN W. FRAKES, a citizen of the United States, and a resident of the city of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Theatrical Apparatus, of which the following is a specification.

My invention relates to improvements in theatrical apparatus of the class known as the "vacuum act," the object being to provide apparatus of this nature which may be readily transported from place to place and which is capable of being operated by an unskilled operator.

The invention consists in the combinations and arrangements of parts hereinafter described and claimed.

My invention will be more readily understood by reference to the accompanying drawings forming a part of this specification, and in which,

Figure 1 is a perspective view showing theatrical apparatus embodying my invention. Fig. 2 is a bottom plan view of a portion of said apparatus. Fig. 3 is a perspective vertical section showing the mechanism provided for each vacuum cup employed in the apparatus. Fig. 4 is a bottom plan view of a vacuum cup closure disk, and, Fig. 5 is a perspective view of the latter.

The preferred form of construction as illustrated in the accompanying drawings comprises an elongated air chamber 1 which is suspended in an elevated position by means of vertically disposed members 2 which connect with said chamber at the corners thereof, as clearly illustrated in Fig. 1. The air chamber 1 is composed of elongated edge members 3 and 4, the former being tapered to a thin edge in order to present a neat appearance to the audience viewing the act. Connecting the members 3 and 4 are bottom and top members 5 and 6 respectively, the former being tongued and grooved in the members 3 and 4 and the latter being simply recessed therein. Member 6 is provided with an opening 6' which admits air freely to chamber 1. This places said chamber in open communication with the atmosphere.

Extending the entire length of the chamber 1 and disposed medially above the bottom 5 is an air suction pipe 7, there being a pair of pipes 8 connecting said pipe with

ing the act the air-pump is supposed to be in operation for maintaining a constant partial vacuum in the pipe 7. Leading from the pipe 7 to adjacent vacuum cups 9 are branches 10, the same extending into the bottom 5 as clearly illustrated in Fig. 3. The vacuum cups 9 are cylindrical in form and depend from the bottom 5 of the air chamber 1 in such a manner that the axes thereof are vertical. The lower ends of the vacuum cups 9 are normally in open communication with atmosphere and the upper ends thereof are provided with inwardly extending radial flanges 11 which are secured to the bottom of the chamber 1 by means of a plurality of screws 12, this feature being illustrated in Fig. 3. In order to close the open lower ends of vacuum cups 9 a pair of circular plates or disks 13 are secured to the feet of the performer by means of buckle straps 14, the latter being passed through a pair of perforated lugs 15, as clearly illustrated in Figs. 4 and 5. In order that the disks 13 shall fit securely to the bottom of vacuum cup 9, the same are preferably faced with a yieldable material 16, such as rubber or felt. The plates 13 are preferably formed of leather, but other suitable material may be employed.

Provided at the upper end of each vacuum cup 9 and fulcrumed to a central lug 17 depending from the bottom member 5 is a diametrically disposed valve lever 18, having valves 19 and 20 at opposite ends thereof. Disposed above the valves 19 and 20 and adapted to be opened and closed thereby is a pair of ports 19' and 20', the former being in open communication with the interior of the chamber 1 and the latter forming a connection with a branch pipe 10. The construction of the valve lever 18 and the valves 19 and 20 carried thereby is such that when the port 19' is closed that the port 20' is opened and vice versa.

In order to oscillate the lever 18 when it is desired to form a partial vacuum in the vacuum cup 9 for supporting the performer an axial stem 21 is provided on the valve 19 which extends upwardly through the port 19' into the interior of the chamber 1. The upper end of the stem 21 terminates in an armature 22 and arranged coaxially therewith and disposed thereabove is an electromagnet 23, the latter being in an electrical circuit which is controlled by the operator. It is apparent from this construc-

tion that when the electromagnet 23 is energized by a current passing therethrough that the stem 21 and armature will be elevated, thus closing the valve 19. When the valve 19 is thus closed the valve 20 will be opened, as aforesaid, to permit of the air suction in the pipe 7 exhausting vacuum cup 9, thus creating an unbalanced pressure on the disk 13. It is obvious that the area of the bottom end of each vacuum cup must be sufficient for the atmospheric pressure to support the performer. In order to hold the armature 22 in the elevated position for maintaining the partial vacuum in the vacuum cup 9, a locking device is provided which consists in a swinging arm 24 arranged adjacent said armature and adapted to swing into engagement with a recess 25 provided in the same when in the position as illustrated in Fig. 3. When it is desired to release the closure plate 13 and to cut off the influence of the air suction in the pipe 7 a second electromagnet 26 is energized which is adapted to draw the arm 24 into the dotted line position, thus releasing the armature 22 and permitting the same to fall by gravity and by the air suction exerted upon the valve 20. The electromagnet 26 is disposed at right angles to that of electromagnet 23 and is rigidly secured in chamber 1 by means of a depending bracket 27 as is clearly illustrated in Fig. 3. The lower end of the swinging arm 24 is suitably pivoted to a bearing 28 which is arranged adjacent the port 19' and secured to the bottom member 5 of the chamber 1.

The operation of the apparatus is as follows: Assuming that an air suction is maintained in the pipe 7 by the air pump to which it is connected, then in order to render one of the vacuum cups operative the operator must close the circuit including the electromagnet 23 of the vacuum cup in which it is desired to produce a vacuum for supporting the performer. The operator must be within sight of the performer and know by the position of the latter which vacuum cup to render operative, there being a switch-board, not shown, which corresponds with all of the vacuum cups of the series. When it is seen that the performer wishes to be released from a vacuum cup and to be supported by the next one in the series the operator closes the circuit in which is provided an electromagnet 26 which causes the releasement of the performer as aforesaid. However, before releasing the operator from one vacuum cup, the next one in the series must be rendered operative, the performer stepping upon said last named cup before being released from the other. In this manner the performer is enabled to walk over the series of vacuum cups which are arranged in staggered relation to permit of ease in walking.

The act which is rendered possible by the foregoing apparatus is mystifying and attractive and the construction of the apparatus is simple and inexpensive. Moreover since the apparatus is compact, the same may be transported readily from place to place.

If so desired a trapeze 29 is provided at each end of the apparatus as clearly illustrated in Fig. 1.

While I have illustrated and described the preferred construction for carrying my invention into effect this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth but desire to avail myself of such variations and modifications as fairly fall within the spirit and scope of the appended claims.

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

1. In a theatrical apparatus, a series of vacuum cups open at their bottoms; controllable means for exhausting air from said cups; controllable means for admitting air to said cups; closure plates for said cups; and means for securing said plates to the feet, substantially as described.

2. In a theatrical apparatus of the class described, an elevated air chamber, having air at atmospheric pressure therein; a series of vacuum cups depending from said chamber and having valved connection therewith, a suction pipe in valved connection with said cups, and electrical valve operating means for establishing communication between said chamber and cups and said pipe and cups alternately, substantially as described.

3. In a theatrical apparatus of the class described, an elevated elongated air chamber in open communication with atmosphere, a series of vacuum cups depending from said chamber and in valved communication therewith, a suction pipe provided in said chamber in valved connection with said cups, electrical means for opening the valves connecting said cups and chamber, and means cooperating with said last named means for simultaneously connecting said cups and suction pipe, substantially as described.

4. In a theatrical apparatus of the class described, an elongated horizontally disposed elevated air chamber, there being an air vent in said chamber to maintain atmospheric pressure therein, a series of vacuum cups depending from said chamber, the axes of which are vertically disposed, the lower ends of said cups being opened and the upper ends thereof in valved connection with said chamber; a closure disk adapted to close the lower end of any one

of said cups; a suction pipe arranged in valved connection with said vacuum cups, and coöperative means for opening a valve connecting a cup with said suction pipe

5 when the valve connecting said last named cup with said chamber is closed, substantially as described.

5. A theatrical apparatus of the class described, comprising an elongated air chamber, means for supporting said chamber in an elevated position, the pressure within said chamber being maintained at substantially atmospheric pressure, a series of vacuum cups depending from said chamber, the axes of which are vertical, a suction pipe extending through said chamber, branches leading from said pipe and arranged in valved connection with said vacuum cups, the lower end of the latter

10 being normally open to atmosphere; a pair of closure plates adapted to close the lower ends of said vacuum cups, the latter being in valved connection with said chamber; an oscillatory valve lever fulcrumed at the

15 upper end of each vacuum cup, one end of said lever being formed into a valve constituting the valved connection with said chamber, and the other end thereof being formed into a valve constituting the valved

20 connection with said suction pipe, the arrangement of said valves being such that when communication is established between said chamber and any given cup that the communication of the latter with said suction pipe is cut-off; and electrical means for

25 oscillating said valve lever in one direction, the movement in the other direction of said valve lever being effected by gravity and air suction, substantially as described.

40 6. A theatrical apparatus of the class described, comprising an elongated air chamber, supported in an elevated position, there being an air vent in said chamber to maintain the pressure therein at substantially

45 atmospheric pressure; a series of vacuum cups depending from said chamber and arranged in a staggered row, the axes of said cups being vertical and the lower ends thereof being normally open to atmosphere; a

50 pair of closure disks faced with yieldable material for closing the open ends of said cups; means for securing said disks to the feet of a performer, the upper end of each vacuum cup being provided with an in-

55 wardly extending flange which is secured to the lower surface of said chamber; a suction pipe disposed longitudinally in said air chamber and provided with branches leading therefrom to adjacent cups; an oscillatory diametrically arranged valve lever

60 fulcrumed at the upper end of each cup, one end of said valve lever being provided with a valve for establishing communication of the corresponding cup with said chamber, the other end of said valve lever being

provided with a valve for establishing communication with the corresponding branch of said suction pipe, the construction being such that when the valve connecting said cup with said chamber is closed that the corresponding valve connecting said cup with said suction pipe is open; and electrical means for closing the valve connecting said cup with said air chamber, the valve connecting the cup with said suction pipe being

70 closed by gravity and air suction; substantially as described.

7. A theatrical apparatus of the class described comprising an elongated air chamber, means for suspending said chamber in an elevated position, the air within said chamber being in open communication with atmosphere; a series of vacuum cups provided on the under side of said chamber and arranged in staggered relation, the axes of

80 said cups being vertical and the lower ends thereof normally in open communication to atmosphere; a pair of closure plates adapted to be secured to the feet of a performer and to close the open ends of said cups alternately; a diametrically disposed valve lever fulcrumed to the upper end of each vacuum cup, a suction pipe extending longitudinally in said air chamber and having branches leading therefrom to adjacent cups, there

85 being a pair of ports provided in the bottom of said air chamber at the upper end of each cup, one of said ports connecting with the corresponding branch of said suction pipe and the other of said ports establishing

90 communication between said air chamber and the cup, said valve lever being provided with valves at each end for closing said ports alternately; a stem extending through the port connecting said air chamber with the cup and provided with an armature at the upper end thereof, the lower end of said stem being formed integral with the corresponding valve; an electromagnet arranged adjacent said armature and adapted to

95 draw the said armature upwardly when said magnet is energized; means for locking said armature in an elevated position, the valve connecting said air chamber with the cup being closed when said armature is in an elevated position and the valve connecting said cup with the corresponding branch of said suction pipe being open; and electrical means for unlocking said armature, whereupon the latter will fall by gravity and effect the closing of the valve connecting the cup with the corresponding branch of said suction pipe, substantially as described.

8. A theatrical apparatus of the class described comprising an elevated elongated air chamber, having horizontally disposed edge members and top and bottom members connecting the same and secured thereto, there being a vent hole provided in said top member for maintaining the pressure within the

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said chamber substantially at atmospheric pressure; a series of cylindrical vacuum cups arranged in staggered relation and depending from the bottom of said air chamber, the axes of said cups being vertical and the lower ends thereof being open to atmosphere; a longitudinally disposed air suction pipe disposed medially above the bottom of said air chamber and provided with branches leading therefrom to adjacent vacuum cups, there being a pair of ports in the bottom of said chamber for each vacuum cup, one of said ports establishing free communication between the cup and said chamber, the other of said ports constituting the terminal of one of said branches; a diametrically disposed valve lever adapted to swing in a vertical plane and fulcrumed to the bottom of said chamber at the upper end of each vacuum cup, there being a valve on one end of said valve lever for cutting off the communication of the cup with said chamber, and a valve at the other end of said lever for closing the port leading to the corresponding branch of said suction pipe, the construction being such that when one of said ports is closed that the other is opened; a stem arranged axially on the valve adapted to close the port connecting said chamber with the cup and extending therethrough; an armature provided at the upper end of said stem, an electromagnet adapted to draw said armature upwardly when energized thus closing the corresponding valve; a pivoted arm arranged adjacent said armature and adapted to automatically lock the same in an elevated position, and a second electromagnet adapted to move said arm for unlocking said armature, whereupon the corresponding valve will be opened by gravity and air suction on the valve at the other end of said lever, substantially as described.

9. A theatrical apparatus of the class described comprising an elongated hollow chamber suspended in an elevated position,

means for maintaining the air within said chamber at substantially atmospheric pressure, a row of vacuum cups depending from said chamber and arranged in staggered relation, the lower ends of said vacuum cups being normally in open communication with atmosphere, a pair of circular closure plates of a diameter slightly greater than that of said vacuum cups and adapted to close the lower ends of the latter, means for securing said closure plates to the feet of a performer; an oscillatory lever having a valve at each end and fulcrumed at the upper end of each vacuum cup, there being a pair of ports extending through the bottom of said chamber and adapted to be opened and closed by said valves; a suction pipe provided in said chamber and connecting with one of the ports of each vacuum cup, the other of said ports establishing communication between the cup and chamber, the valve adapted to close said last named port being provided with a stem extending upwardly therethrough; an armature provided at the upper end of said stem and adapted to move vertically therewith; an electromagnet arranged in axial alinement with said stem and adapted to draw said armature when energized, there being a recess provided in one edge of said armature, a swinging arm adjacent said armature to upper end of which is adapted to engage said recess when said armature is drawn to an elevated position, resilient means connected with said arm for automatically effecting said engagement, and a second electromagnet adapted to unlock said arm when energized, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN W. FRAKES.

Witnesses:

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W. C. SMITH.