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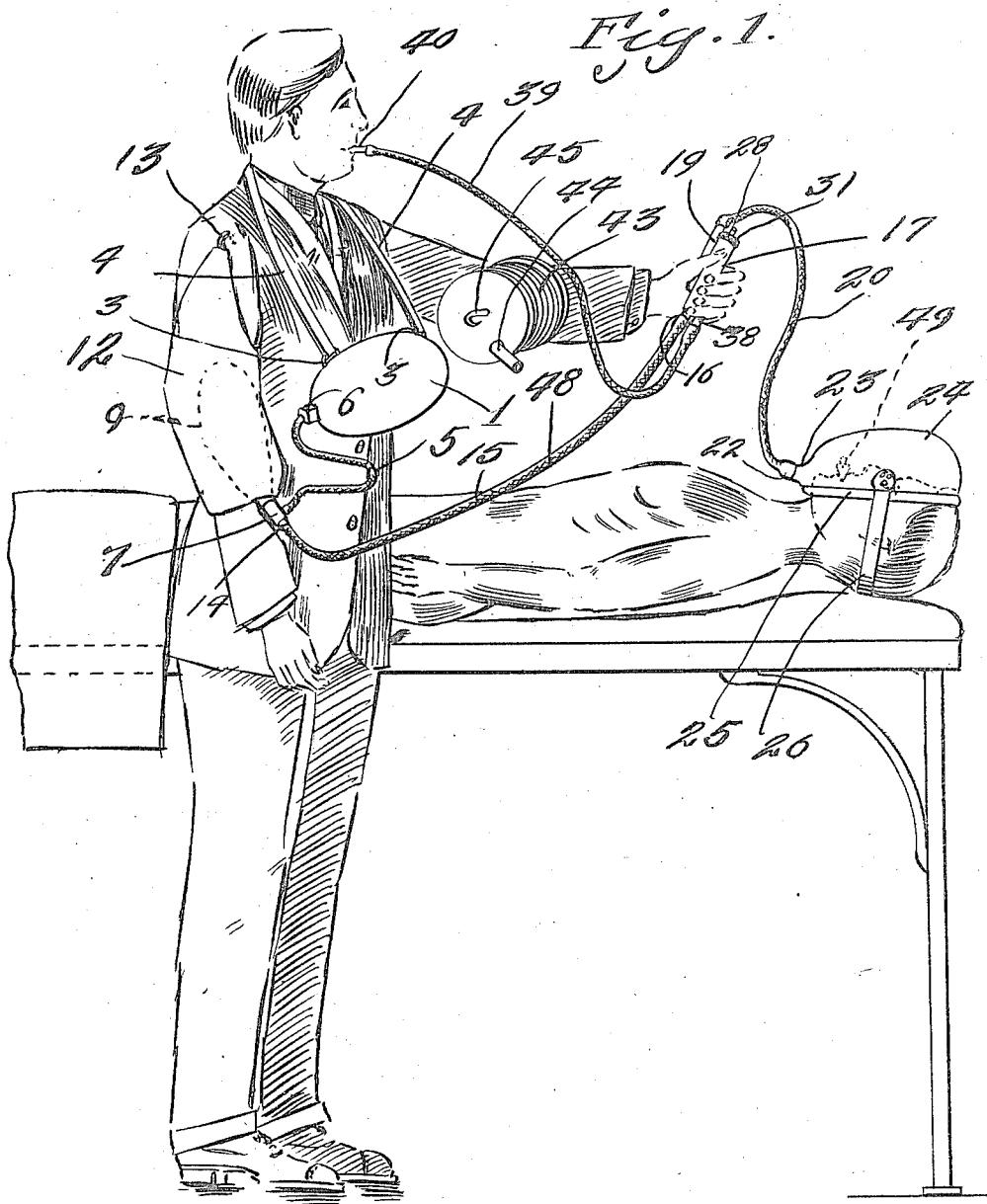
PULMOTOR.

APPLICATION FILED JUNE 15, 1915.

1,177,208.

Patented Mar. 28, 1916.

3 SHEETS—SHEET 1.



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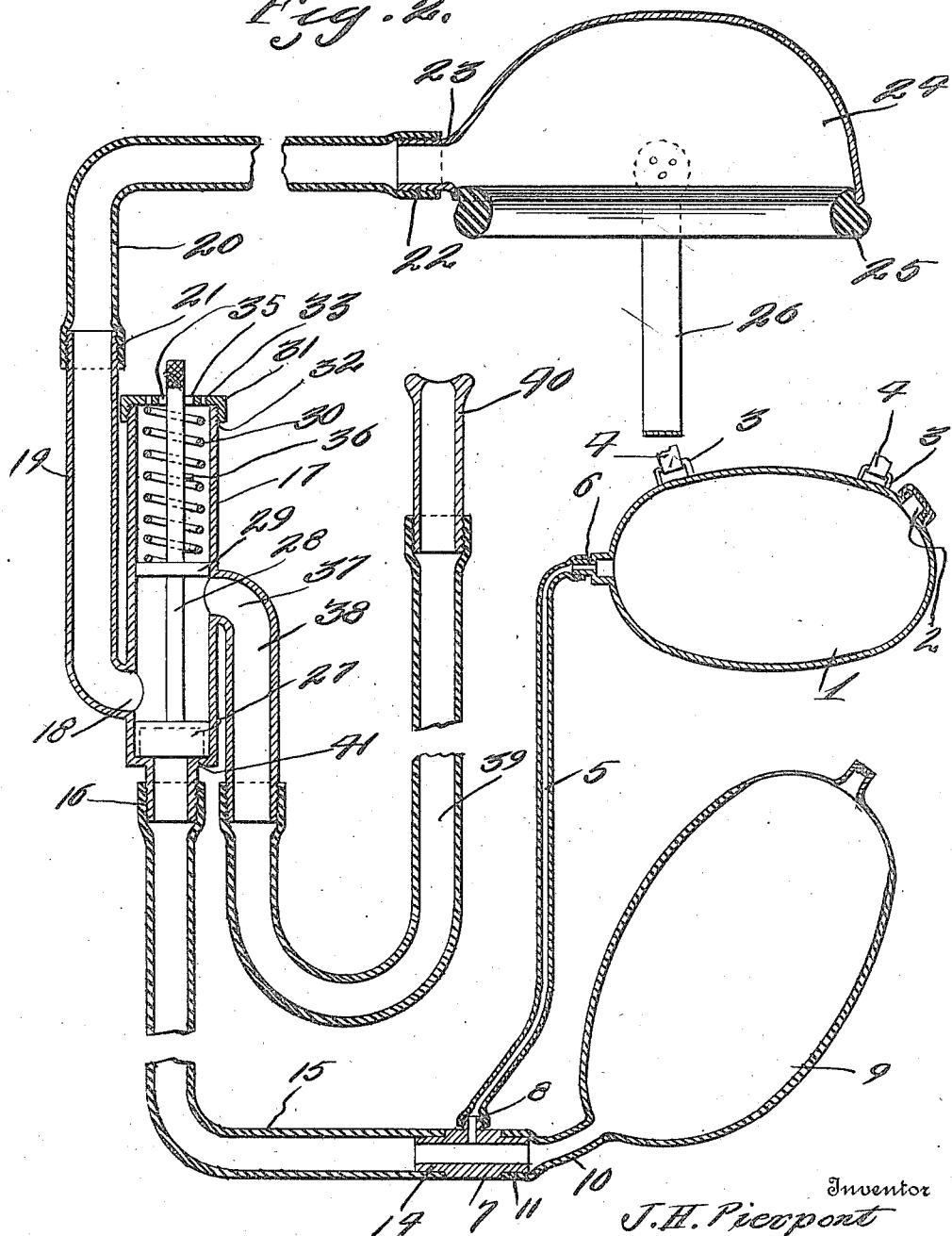
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3 SHEETS—SHEET 2.

Fig. 2.



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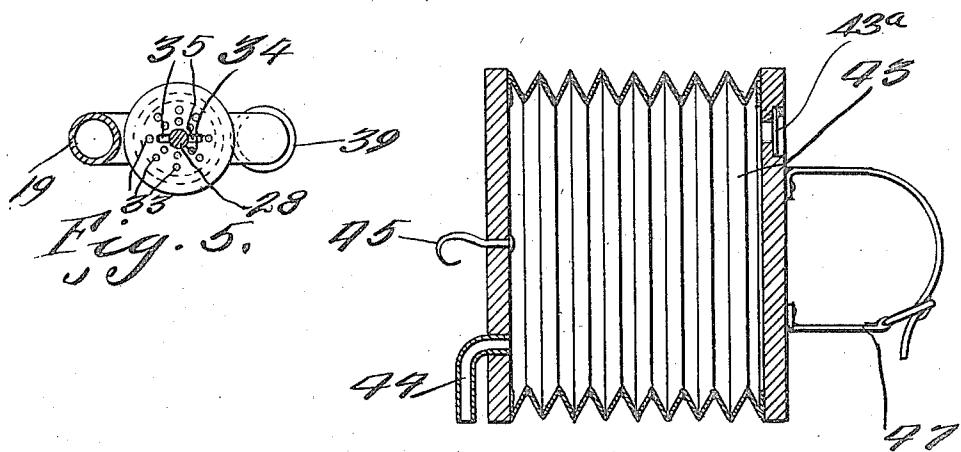
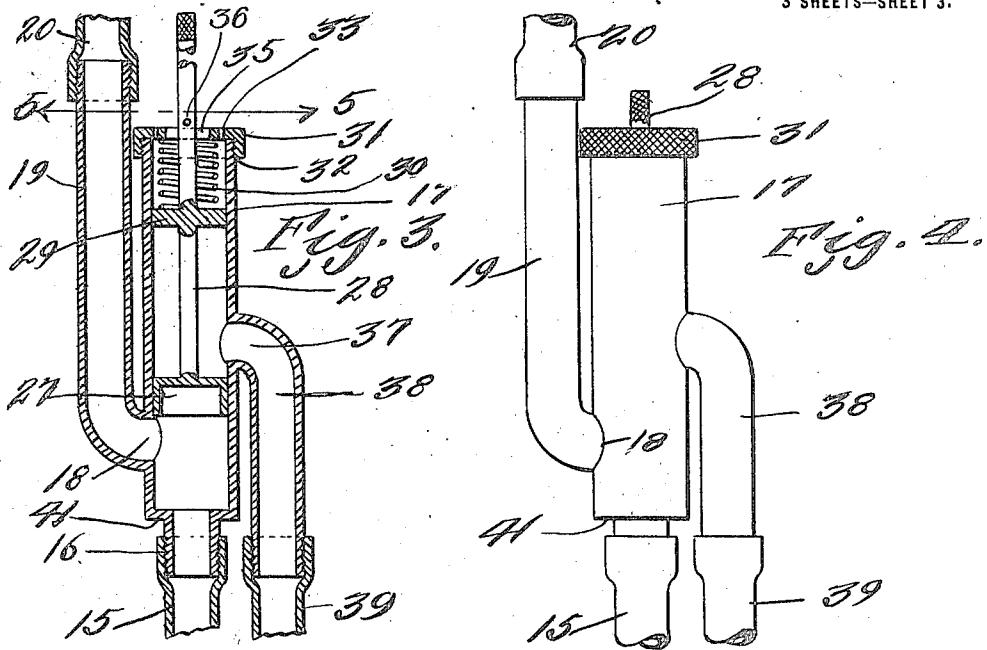


Fig. 6.

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UNITED STATES PATENT OFFICE.

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PULMOTOR.

1,177,208.

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To all whom it may concern:

Be it known that I, JURIAH H. PIERPONT, a citizen of the United States, residing at Pensacola, in the county of Escambia and State of Florida, have invented a new and useful Pulmotor; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improved pulmotor, particularly adapted for resuscitating persons from which life is supposedly extinct.

One of the objects of the invention is to provide means for injecting intermittent supplies of oxygen or oxygenated air into an apparently dead body, or corpse, to resuscitate the body, or for restoring life.

Another object of the invention is to provide a means consisting of a spring tensioned valve, for controlling the oxygen or oxygenated air, as it is intermittently discharged into the air passages.

A further object of the invention is to provide means to prevent the valve from binding during its intermittent action.

Another object of the invention is the provision of a human pulmotor including means, whereby artificial respiration may be applied or injected into a body, wherein there is still sufficient heart action and the lungs are relieved of substantially all air or oxygen, without utilizing the stored oxygen or oxygenated air of the apparatus. This is accomplished by an extra tube connection with the valve casing above the valve therein, and through the tube from the valve casing to the face mask or hood, which fits over the nose and mouth.

Another object of the invention is to provide means for holding the valve raised sufficiently, whereby a combined steady supply of stored oxygen or oxygenated air may be injected through the tube connection between the valve casing and the face mask or hood, especially in cases, where life has been extinct for a considerable time, apparently beyond resuscitating. Very often a device of this nature is utilized for keeping life, or extending life of a dying person.

Another object of the invention is to provide means for forcing or injecting the oxygen or oxygenated air into the body, and yet at the same time permit the operator or physician to have free use of his hands and arms, so that while forcing or injecting the oxygen into the body, the operator is at liberty to work the arms and hands of the body, applying artificial respiration in addition to the injection of oxygen or oxygenated air.

Another object of the invention is to provide a sleeve having a pneumatic means for siphoning or forcing the oxygen through the apparatus by compression. This sleeve is adapted to be worn upon the arm of the operator with a pneumatic means adjacent to or between the body of the operator and his arm.

Another object of the invention is to provide an auxiliary device, consisting of a bellows, to which the apparatus or pulmotor may be attached, whereby the exhausted air in the patient's lungs can be sucked out instead of being forced out by external pressure applied to the patient's chest and abdomen.

In practical fields the details of construction may necessitate alterations, falling within the scope of what is claimed.

The invention comprises further features and combination of parts, as hereinafter set forth, shown in the drawings and claimed.

In the drawings: Figure 1 is a view in perspective of the improved pulmotor, illustrating the application and use of the same, the valve casing merely being held by the operator for the purpose of illustration, not through necessity. Fig. 2 is an enlarged sectional view through the various parts of the pulmotor. Fig. 3 is a sectional view through the valve casing and the adjacent attending parts, showing the valve partially raised, so that the oxygen will pass through the tube connection between the valve casing and the face mask or hood. Fig. 4 is a view in side elevation of the valve casing. Fig. 5 is a sectional view on line 5—5 of Fig. 3. Fig. 6 is an enlarged detail view of the auxiliary bellows.

Referring more especially to the drawings, 1, designates a suitable reservoir for containing oxygen having a closure controlled opening 2, whereby the reservoir 5 may be filled. Suitable loops 3 are carried by the reservoir, to which a strap 4 may be connected, to pass about the neck of the operator, for supporting the reservoir in a convenient place. A suitable tube 5 is connected to the reservoir by virtue of a suitable union or coupling 6. A usual form of coupling or connection 7 is provided having a laterally extending threaded nipple 8, to which the tube 5 is connected, shown clearly 10 in Figs. 1 and 2. A suitable pneumatic device or large bulb or bag 9 is provided having an extension tube 10, which is connected at 11 to the connection or coupling 7. This pneumatic device or bulb or pump is carried upon the interior of a sleeve 12, which sleeve is constructed, to be worn upon the arm of the operator, and which sleeve has a suitable hook 13, to engage the clothing of the operator, to support the sleeve 12. Connected at 14 to the coupling or connection 7 is a tube 15, which in turn is connected at 16 to a valve casing 17. Leading from the casing 17 at the point or junction 18 is a metal tube 19, to the end of which a suitable flexible tube 20 is connected at 21. The tube 20 is in turn connected at 22 to an extension 23 of the face mask or hood 24. This mask or hood has its peripheral edge provided with a suitable soft rubber pad 25, to fit the face, covering the nose and mouth of the head of a body being operated upon, in order to make a sufficient air tight connection, thereby preventing the escape of oxygen or oxygenated air or the like. Carried 30 by the face mask or hood is an elastic strap or straps 26 to pass about the back of the head, to hold the mask or hood securely in position.

Mounted in the valve casing 17 is a valve 45 27 provided with a stem 28 which is supplied with a disk 29, which not only constitutes an abutment for the spring 30 (which is interposed between the disk 29 and the top or closure 31 of the valve casing) but also acts as an auxiliary guide for the valve rod and valve, for the reason that said disk 29 slides in the casing. The closure or top 31 (which is threaded at 32 to the casing 17) is provided with a series of 50 apertures 33, which allows air to enter the valve casing above the disk 29, during the actuation of the valve 27, to prevent the valve from binding during its movements. The valve rod 28 passes through and is 55 guided in an opening 34 of the closure or top of the casing 17 and adjoining the opening 34 are two radially disposed openings or slots 35. Carried by the rod 28 is a lug 36, of sufficient size so as to pass through the

radial openings or slots 35. For instance, 65 the valve 27 may be raised sufficiently above the passage 18 of the tube 19 so that the lug 36 will pass through one or the other of the slots or openings 35, after which the rod 28 is given a partial turn, thereby supporting the valve in a raised position. The valve 27 normally rests upon the shoulder 41, and when in such a position an operator of the apparatus may blow through the tube 39, without actuating the pneumatic device 9. 70 This is accomplished in slight cases, where merely artificial respiration is needed.

The bellows 43 is provided with suitable hooks or devices 45, to engage the clothing of the operator, that is, the sleeve and one side of the coat or other wearing apparel, between the arm at any suitable location adjacent the elbow joint and the body of the operator, whereby considerable force 75 may be utilized, for operating the bellows. In lieu of the hooks 45 a suitable elastic strap 47 having an adjustable buckle may be applied to the bellows as shown in Fig. 6, so that the same may be strapped to the arm in a secure and firm position adjacent 80 the elbow joint, whereby the arm of the operator may be brought away from the body with considerable force, in order to suck stagnant air from the lungs.

The various flexible tube connections may 85 be provided with suitable silk armor, as shown at 48 in Fig. 1. In the ordinary cases of resuscitating persons, the pneumatic device 9 which has been filled with oxygen or oxygenated air is operated by the arm of the 90 operator, pressing against the operator's side thus forcing air through the extension tube 10 and the tube 15. The bag 9 is immediately refilled with gas under pressure from No. 1 and the operation is repeated every 95 three to four seconds, the valve 27 being intermittently raised and allowing the oxygen to pass through the tubes 19 and 20 into the face mask or hood, where it enters the nose 100 of the person, which in such cases is propped open by a suitable gag, as indicated at 49 in Fig. 1. In very simple cases the operator may merely blow through the tube 39, which will pass through the valve casing through the tubes 19 and 20 into the face mask for 105 supplying artificial respiration.

When using this improved pulmotor, the mask or hood 24 is first fitted over the face of the patient, while the valve casing 17 is held in one hand, whereas the large bulb or bag 9 is held by a sleeve on the other arm, and the container or reservoir for the oxygen is suspended from the neck of the operator or physician by a suitable strap. In the method shown in Fig. 1, the mouth piece 40 110 may be then placed in the mouth of the operator. The operator having depressed the large bulb or bag, which is between the

arm and the body, the bulb or bag is allowed to expand thereby sucking or drawing oxygen from the reservoir or container into the bulb. The bulb 9 is then depressed, thereby forcing the oxygen through the tube 15, raising the valve 27 above the point or junction 18, in which case the oxygen passes through the tube 19 into the mask or hood, where it enters the patient through the mouth, which is propped open by a suitable gag. Just so soon as the pressure is relieved on the bulb or bag 9, pressure is relieved on the valve 27, and owing to the tension of the spring 30, the valve 27 becomes seated. It is to be observed that as the bag or bulb 9 expands another supply of oxygen is drawn into the bag or bulb. After the valve 27 becomes seated, the operator may exert a suction force through the tube 39, and the tube 38 (which is in communication with the tubes 19 and 20, that is, when the valve 27 is seated) thereby drawing or sucking the stagnant air from the lungs of the patient. The mouthpiece 40 of the tube 39 may be temporarily removed, and then pressure may be applied upon the bag or bulb 9, raising the valve 27, and forcing another supply of oxygen into the body of the patient, after which the valve 27 is allowed to seat again. The mouth piece 40 is again inserted in the mouth of the operator so as to create a suction force as before stated. These operations may be consecutively repeated, until the patient has become resuscitated. If desired, when not using the bulb 9 or the oxygen in the container or reservoir, and in very slight cases, the physician or operator may alternately blow and suck through the tube 39 and the tubes 19 and 20, by placing the mouth piece 40 in the mouth, that is, of the operator. In very extreme cases, the physician or operator may find it inconvenient to suck or draw through the tubes 39, 19 and 20, in order to draw out the stagnant air from the lungs. Therefore, as heretofore set forth in the statements of the invention, a bellows is provided, in which case the mouth piece 40 may be detached from the tube 39, in which case the tube 39 may be connected to the extension tube 44 of the bellows 43 as shown in Fig. 6. After attaching the bellows to the tube 39 in this manner, and just immediately after having raised the valve 27 (due to the pressure of oxygen thereon) the bellows (which may be connected to one of the arms of the operator by the means 47) is depressed. When the bellows is depressed its check valve 43^a opens outwardly, thereby permitting the escape of air or stagnant oxygen from the bellows. The bellows is held depressed as long as the valve 27 is held raised. However, as soon as the valve seats, the bellows is allowed to expand, thereby creating sufficient suction through the tubes 39, 38, 19, and 20, to draw the stagnant air from the lungs into the bellows. Immediately following this operation the bulb or bag 9 is depressed forcing oxygen against the valve 27, raising it above the junction 18, and allowing the oxygen to pass through the tube 19 to the mask, and cutting off communication between the tube 19 and the tube 39. Subsequently to the cutting off of the communication the bellows is depressed, allowing the escape of the stagnant air from the bellows. These operations, when using the bellows in this manner are alternately repeated, until the patient has become resuscitated.

The invention having been set forth, what is claimed as new and useful is:—

1. A pulmator comprising in combination with a face mask, an oxygen reservoir, connections between the reservoir and the mask, a valve casing including a valve in said connections, pneumatic means for intermittently actuating said valve for intermittently injecting or siphoning oxygen through the connections, to and through the mask, means for preventing the valve from binding during its intermittent action, and means comprising a tube connected to the valve casing above the valve, whereby the operator may blow through the casing and that portion of the connections between the casing and the face mask without operating the pneumatic means.
2. A pulmator comprising in combination with a face mask, an oxygen reservoir, connections between the reservoir and the mask, a valve casing including a valve in said connections, pneumatic means for intermittently actuating said valve for intermittently injecting or siphoning oxygen through the connections, to and through the mask, means for preventing the valve from binding during its intermittent action, means comprising a tube connected to the valve casing above the valve, whereby the operator may blow through the casing and that portion of the connections between the casing and the face mask without operating the pneumatic means, and means whereby the valve may be held raised, so that the blow tube and the pneumatic means combined may be utilized for supplying artificial respiration to the body for resuscitating the same.
3. A pulmator comprising in combination with a face mask, an oxygen reservoir, connections between the reservoir and the mask, a valve casing including a valve in said connections, pneumatic means for intermittently actuating said valve for intermittently injecting or siphoning oxygen through the connections, to and through the mask, a blow tube connected to the casing of the

valve, whereby air may be supplied to the
mask, and means whereby the valve may be
held raised, so that the blow tube and pneu-
matic means combined may be utilized for
5 supplying artificial respiration to the body
for resuscitating the same.

In testimony whereof I have signed my

name to this specification in the presence of
two subscribing witnesses.

JURIAH HARRIS PIERPONT.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."