(No Model.)

J. C. KENNEDY.

APPARATUS FOR MEDICATING, COMPRESSING, AND ADMINISTERING AIR.

No. 422,802. Patented Mar. 4, 1890.

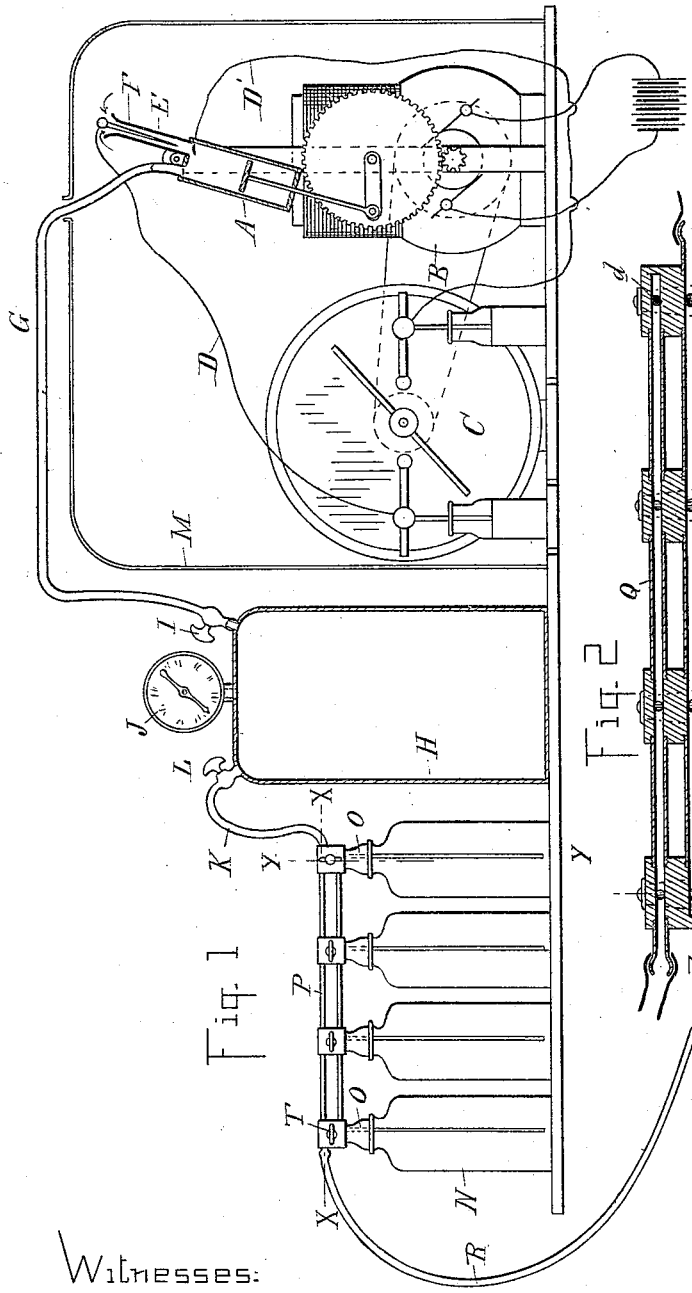

Fig. 1

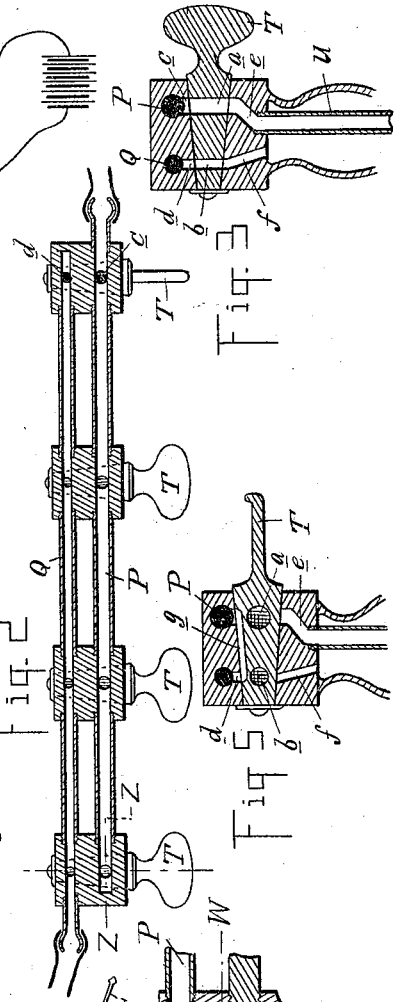

Fig. 2

Fig. 3

Fig. 5

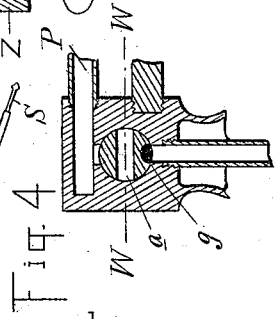

Fig. 4

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UNITED STATES PATENT OFFICE.

JOHN C. KENNEDY, OF DETROIT, MICHIGAN.

APPARATUS FOR MEDICATING, COMPRESSING, AND ADMINISTERING AIR.

SPECIFICATION forming part of Letters Patent No. 422,802, dated March 4, 1890.

Application filed December 13, 1888. Serial No. 293,442. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. KENNEDY, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Apparatus for Medicating, Compressing, and Administering Air, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to new and useful improvements in apparatus for medicating, compressing, and administering air.

My invention consists in the peculiar construction, arrangement, and combination of different parts, whereby the apparatus is adapted for the use of medical practitioners for administering any one of the known curative properties applied at the present day in the treatment of diseases by the application of air into the respiratory organs of the human system, all as more fully hereinafter described, and shown in the accompanying drawings, in which—

Figure 1 is a sectional elevation of my apparatus for ozonizing air. Fig. 2 is a horizontal section on line X X in Fig. 1. Fig. 3 is a cross-section on line Y Y in Fig. 1. Fig. 4 is a vertical section on line Z Z in Fig. 2; and Fig. 5 is a section on line W W in Fig. 4, with the valve-plug shown in a different position.

A is an air-pump of any suitable description. B is its actuating-motor, for which an electrical motor will be found to be most suitable, as but light power is required to operate the apparatus.

C is a generator of statical electricity, mounted in suitable proximity to the motor, and preferably provided with suitable drive-connection with the motor.

D and D′ are electrical conductors leading from the opposite poles of the generator.

E is an insulating-tube connected to the air-suction of the pump.

F is a metallic sharp-pointed electrode mounted within said tube and connected with one pole of the generator by the wire D. The electrical conductor D′ is connected to the metallic parts of the pump, but may be connected to a separate electrode extending into proximity to the electrode F.

G is a flexible pipe through which the compressed air from the pump is discharged.

I is a stop-cock to disconnect the reservoir from the pump.

J is a pressure-gage attached to the reservoir.

K is an outgoing pipe from the reservoir, and L is a stop-cock in said outgoing pipe.

The operation of my device as far as described is as follows: By putting the motor into action the pump A sucks the air in through the inlet opening or tube E, and compresses and discharges it through the tube G into the reservoir. By continuing the operation of the pump for a suitable period of time the reservoir will become filled with the compressed air, provided the cock L is closed and the cock I opened. At the same time with the pump the statical generator will be put into action and the electricity generated will be conducted to the two poles of the generator, one of which is the electrode F, while the other is formed by the metallic parts of the pump in proximity thereto, or the separate electrode in proximity to the electrode F, whereby, as is well known, a constant discharge from one electrode to the other will take place within the tube E, through which the air is conducted into the pump. Thus all the air sucked in by the pump will have to pass through the electrical field existing at the point of the electrode F, and thereby electrified and ozonized, as is well known, before it is discharged into the reservoir.

To get all the benefit of the electricity generated, of which a portion is lost by leakage or imperfect insulation, I inclose that whole portion of my apparatus, preferably, under a bell-glass M.

For medicating and administering the air my apparatus is provided with the following parts: A number of suitable bottles N are provided with stoppers O fitted in the mouths thereof, and the upper portions of these stoppers are connected by two tubes P and Q. The tube P is connected with the flexible pipe K from the receiver and connects all the stoppers, but it is stopped off at the last bottle. The other tube Q connects all the stoppers in the same manner, but it is stopped off in the first stopper and projects out through the last stopper of the row of bottles, where

it is connected to the flexible discharge-pipe R, to which a suitable nozzle S is attached for administering the air into the mouth or nose of the patient. Below the pipes P and Q there is placed in each stopper a valve-plug T, provided with two ports *a* and *b*, which, when the plug is in the position shown in Fig. 3, are adapted to communicate with corresponding ports *c* and *d* above the plug, and which ports open into the tubes P and Q. With the same position of the valve-plug the port *a* communicates through the port *e* on the under side of the plug with the tube U, which extends down into the bottle to near the bottom thereof, and the port *b* communicates with a port *f*, which opens into the top of the bottle. Thus, if the plug is in the position shown in Fig. 3, a communication is established from the pipe P through the ports *c*, *a*, and *e* into the bottle and back through the ports *f*, *b*, and *d* into the tube Q; but if a quarter-turn is given to the plug communication is cut off between the tubes P and Q. The valve-plug in the last bottle is provided with an additional port *g*, which is adapted to directly connect the ports *c* and *d* without passing through the bottle.

In practice the bottles N are designed for the reception of the medical agents with which the air is intended to be medicated in the usual manner by vaporizing small portions thereof in passing through said agent. Now it will be seen that if the apparatus is arranged as shown in the drawings, by opening the valve L, air from the reservoir is discharged into the tube P, and its only means of escape is by passing into the tube Q through the ports in the valve-plug of the first bottle, which, as shown in Figs. 2 and 3 of the drawings, connects the two tubes in the manner described; the other plugs being shown turned at right angles thereto, all passage from the tube P into the tube Q is cut off. Thus the compressed air passes through the medical agent contained in the first bottle and becomes medicated thereby, and the air issuing from the nozzle S of the discharge-pipe will discharge air having been submitted to the ozonizing, compressing, and medicating process carried out by the apparatus, and may be administered by force of the pressure or in the usual manner into the respiratory organs of the patient.

By manipulating the valve-plugs T in any desired manner to establish communication between the pipes P and Q the compressed air may be forced to take its way through any desired bottle, or through several or all of them, if desired, to impart different medical properties to the air. If it should, however, be desired to administer the air without having undergone the medicating process, the last valve of the series of bottles is turned in such position as to connect by its port *g* the two tubes P and Q, as shown in Fig. 5, and if communication between the tubes P and Q is cut off by all the other valve-plugs the air will flow through the tube P into the tube Q by the only way provided for without passing through any of the bottles.

I preferably construct the air-passages into the pipe Q smaller than the air-passages in the pipe P and the ports connecting therewith, for the purpose of forcing the air through as many bottles as desired and maintaining the pressure of air within the bottles, so as to pass the air in its compressed state through the medicating agent.

I am aware that it is not new to medicate air by causing it to flow through a receptacle containing a solution of some medical agent either by forcing the air in with a pump or drawing it through by suction, as in the process of inhalation; but no high degree of inflation or impaction of the organs into which the air was administered could be obtained in this manner. In apparatus provided with a pump or other means for forcing in the air it has always been the practice to locate the valve controlling the admission of air into the medicating-bottle between the bottle or bottles and the source of air-supply, and the air was thus allowed to expand and to pass with a pressure reduced to the normal air-pressure, or nearly so, through the medicating agent in the delivery-tube from which it is administered.

In my construction it will be observed that the valve-plug in the stopper controls the discharge of air from the medicating-bottle, and at the same time a sufficiently larger quantity of air is always admitted into the bottle to maintain the air-pressure within the bottle at the same pressure, or nearly so, contained in the air-reservoir on account of the inlet ports or passages into the bottle being of larger area than those leading from it. The difference is very important, as it gives to the application of my apparatus a much larger field when it is considered that in connection with air compressed to a very high degree in the reservoir—say one hundred pounds or more—I add to its greater concentration the mechanical action of such compressed air to become a vehicle for vapors as well as for small particles to be mechanically carried away. There are many medical agents with which it is very difficult or entirely impossible to impregnate the air under ordinary pressure, while by the added mechanical action of air under high pressure the impregnating is readily obtained. Thus, the air being forced through the medical agent in the bottle in a highly compressed state and maintained in the bottle in the same state, or nearly so, it not only becomes impregnated to a higher degree, but is also adapted to form a vehicle for almost any medical agent, and thus becomes a new factor in treating diseases by the administration of air to which medical properties are imparted. Thus, for instance, I am enabled with my apparatus to impregnate the air with solutions of nitrate of silver, chloride of gold, and other salts of metals, or solutions

of other medicaments not capable of being vaporized, or but indifferently so. At the same time, the application of such medical agents by means of compressed air as a vehicle acting to inflate, the medical agent is impacted and a minimum is only required to produce a maximum result.

No claim is made herein to the ozonizing apparatus shown in Fig. 1, as substantially the same is described and claimed in my application, Serial No. 301,225, filed February 26, 1889.

What I claim as my invention is—

1. In a device for medicating compressed air, the combination, with the air-reservoir H or other source of compressed air, of the series of medicating-bottles N, provided with the stoppers O, the delivery-pipe P, connecting all the stoppers with the source of compressed air, the air-delivery pipe connecting all the stoppers with the discharge, and the valve-plug in each stopper, adapted to form multiple connection between the pipes P and Q through the medical agent in the bottle, substantially as described.

2. The combination, with the air-reservoir or other source of compressed air, of the series of medicating-bottles N, the stoppers O, the pipes P and Q, connecting said stoppers, the tube K, connecting the pipe P with the source of compressed air and having the valve L, the discharge-pipe R, connecting the pipe Q with the discharge-nozzle, the valve-plugs T, having the ports *a* and *b* to connect the pipes P and Q through suitable ports in the stopper and through the pipe U in each bottle, and the port *g* in the last plug of the series, substantially as described.

3. The combination, in a medicating apparatus, of the bottle, the pipe U, the stopper O, secured in the bottle and having the ports *c d e f*, said port *c* communicating with a passage running horizontally through the stopper and through a tube connected thereto, with the valve-plug T, having the ports *a* and *b*, adapted to correspond with the ports *c d e f* and provided with closed ends, substantially as described.

4. The combination, with the air-reservoir or other source of compressed air, of the series of medicating-bottles, the stoppers O, secured thereto, the pipes P and Q, adapted to connect said stoppers, respectively, with the source of compressed air and with the discharge-tube, and valve-controlled multiple connections in each stopper between said pipes P and Q, such connections having large ports connecting with the air-inlet and smaller ports connecting with the air-outlet, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 11th day of December, 1888.

JOHN C. KENNEDY.

Witnesses:
J. PAUL MAYER,
P. M. HULBERT.