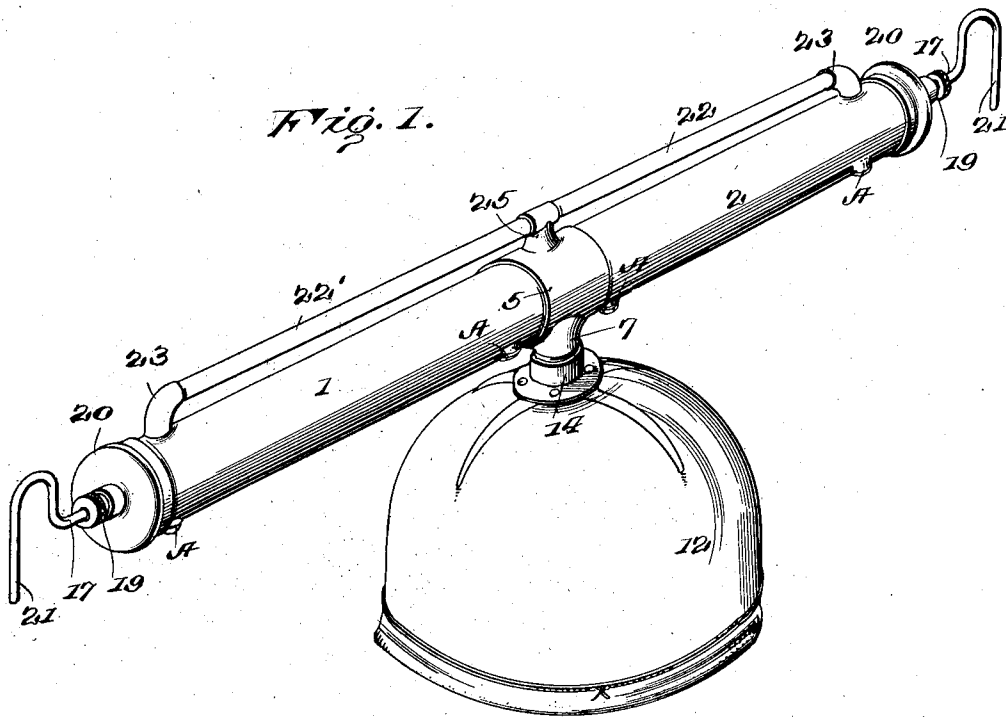
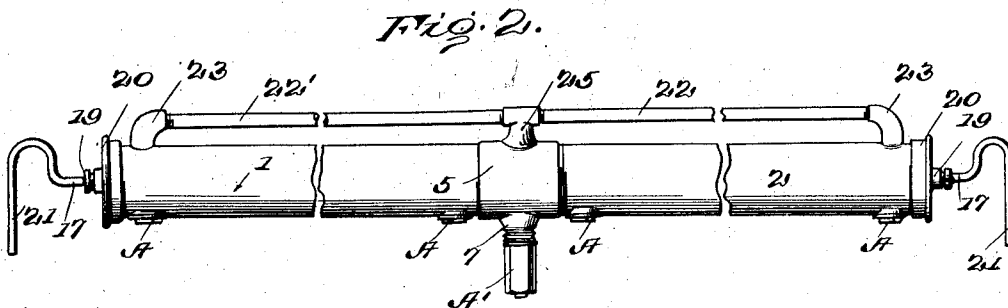


T. McCONNELL.
VACUUM APPARATUS.
APPLICATION FILED APR. 28, 1920.

1,355,679.

Patented Oct. 12, 1920.
2 SHEETS—SHEET 1.



Inventor
T. Mc Connell.

By

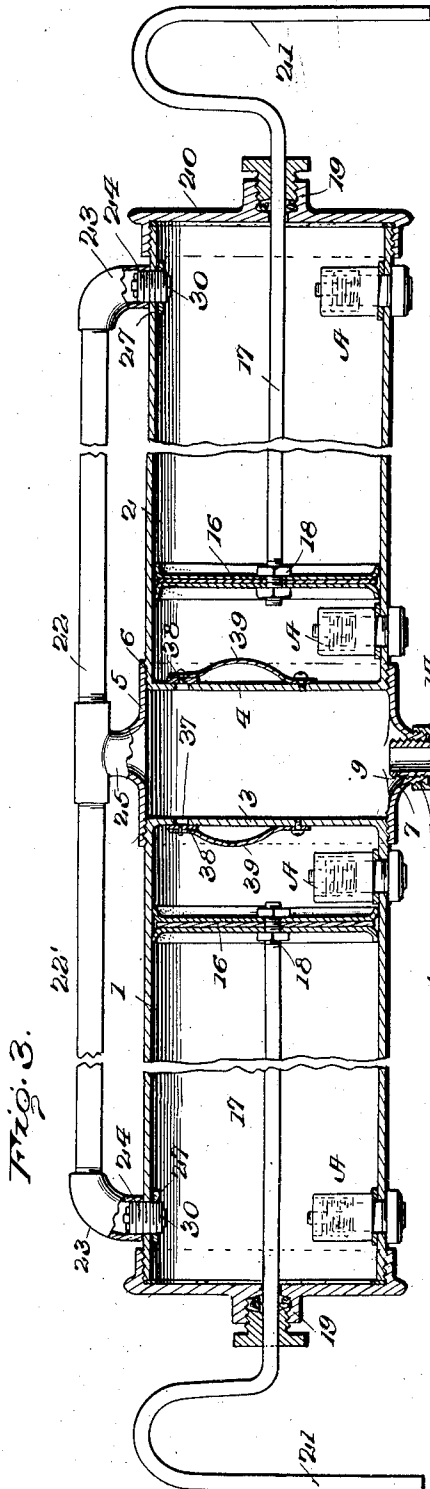
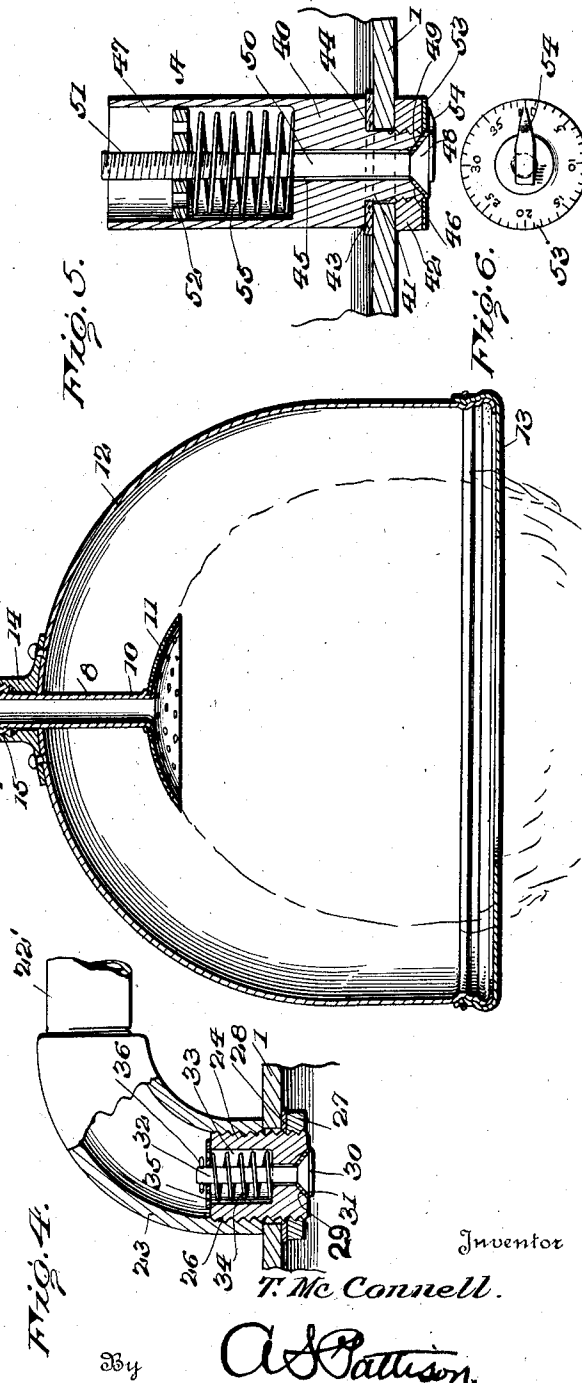
A. S. Pattison

Attorney

1,355,679.

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2 SHEETS—SHEET 2.



Inventor

T. Mc Connell.

A. S. Patton

Attorney

UNITED STATES PATENT OFFICE.

THOMAS McCONNELL, OF NEW KENSINGTON, PENNSYLVANIA.

VACUUM APPARATUS.

1,355,679.

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To all whom it may concern:

Be it known that I, THOMAS McCONNELL, a citizen of the United States, residing at New Kensington, in the county of Westmoreland and State of Pennsylvania, have invented certain new and useful Improvements in Vacuum Apparatus, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in vacuum apparatus, and is an improvement on my Patent No. 1,314,409, dated August 26th, 1919.

One object of my present improvement is to create a vacuum in the helmet by both the in and out movements of the pistons, whereby the vacuum pumping action is made double acting and creates a substantially continuous suction action within the helmet, instead of having the pistons with a suction action in one direction only, as in my aforesaid patent.

Another object of my present invention is to provide the apparatus with means for controlling the amount of power necessary to move the pistons, whereby the operator can control the degree of exercise required for operating the apparatus, and whereby the apparatus has a two-in-one function of developing a healthy body through physical exercise and to treat the scalp by suction action for inducing the growth of the hair on the scalp.

Another object of my present invention is to so construct the means for controlling the physical exercise that its adjustment is indicated upon a dial, whereby the user may from day to day increase the strength required to operate the pistons to keep pace with the muscular development of the user, and to enable the user to determine in pounds the pull required for operating the apparatus.

Another object of my invention is to so construct the apparatus that it may be used for combined scalp treatment and muscular development, or for muscular development alone.

Further objects of the present improvement will appear from the following description:

In the accompanying drawing—

Figure 1 is a perspective view of my improved apparatus, showing it used for combined scalp treatment and muscular development.

Fig. 2 is a side elevation of my improved apparatus, showing it arranged to be used merely for muscular development.

Fig. 3 is an enlarged central longitudinal sectional view of Fig. 1, showing the cylinder connecting the pipe partly in elevation.

Fig. 4 is an enlarged sectional view longitudinally through the valve that is used at the ends of the cylinder or connecting pipe.

Fig. 5 is an enlarged central longitudinal sectional view through one of the valves that are used for regulating the strength or pull required in operating the pistons.

Fig. 6 is an elevation of the outer end of the valve, shown in Fig. 5 with its pointer and dial.

In carrying out my present improvement, I use two cylinders 1 and 2, which have inner closed ends 3 and 4, and these closed ends 3 and 4 are connected by a centrally arranged housing 5. The outer faces of the cylinders and the inner sides of the ends of the housing 5 are provided with meshing screw-threads 6, whereby the cylinders are attached to the housing 5, through the medium of said screw-threads. This arrangement serves to firmly connect the cylinders and the housing, whereby they become a unitary structure. The lower side of the housing 5, is provided with a depending internally screw-threaded nipple 7, into which a suitable tube 8 is screw-threaded as at 9. This tube 8 has its inner end open and communicating with the housing 5, while its outer end 10 carries a perforated supporting plate 11, adapted to rest upon the head of the user. The inner end 10 of the tube 8 is open and in communication with a suitably shaped helmet 12, the helmet carrying at its lower end a rubber diaphragm 13, for tightly fitting the head of the user.

A nipple 14 is rigidly attached to the outside center of the helmet 10 and the housing nipple 7 and helmet nipple 14 are united by suitable screw-threads 15. By this arrangement the helmet and tube 8 can both be disconnected from the housing 5 for a purpose hereinafter explained. Within each of the cylinders 1 and 2 are leather faced pistons 16, and piston rods 17 have their inner ends 18, suitably connected with the pistons 16, and project to the outside of the cylinders through suitable stuffing boxes 19, carried by the detachable outer heads 20 of the cylinders. The outer ends of the piston

rods 17 are shaped into suitable handles 21, to be grasped by the hands of the user for reciprocating the pistons 16 within their cylinders. The outer ends of the cylinders 5 are placed in communication with the housing 5, by suitable pipes 22, 22' located outside of the cylinders and extend from their outer ends. The outer ends 23 of the pipes 22, 22' each carry a suitable valve case 24, and the center of the pipe is in communication with the housing 5, through a centrally located hollow connection 25.

The valve casing 24 is within the end 23 and connected therewith by suitable screw-threads 26, the inner end of the casing extending through the wall of the cylinder and receiving a clamping nut 27, there being a suitable packing washer 28, between the nut 22 and the cylinder wall 1 to make an air-tight joint. This valve casing 24 has its inner end provided with a suitable valve seat 29 to receive a valve 30, which has a leather face 31. The valve stem 32 passes through the casing and the valve stem passage has its inner portion enlarged, as at 33, to receive a suitable spiral spring 34. A washer 35 is located on the inner end of the valve stem 32 and held thereto by a suitable pin 36. By this construction the valve 30 is normally held to its seat by its spring 34.

The valves that are located in the ends 23 of the pipes 22 and 22' are of the same construction, so that the description of only one of these valves is necessary.

The inner heads 3 and 4 of the cylinders 1 and 2 are each provided with transverse openings 37, that are controlled by spring held valves 38. These valves are held normally to their seats for closing the openings 37 by suitable springs 39.

The outer and inner ends of each cylinder 1 and 2 are provided with adjustable outlet valves A, and the construction and object of which will now be described. All of these valves are of the same construction. In describing the details of these valves, reference is made to Fig. 5. These valves have a casing 40. The casing extends into its cylinder and the outer end 41 of the casing is reduced and projects outward through the wall of its cylinder 1, and receives a screw-threaded nut 42. A suitable packing 43 is located between the shoulder 44 of the casing and the inner surface of the cylinder wall 1, whereby an air-tight joint is made between the casing and the cylinder wall. This casing is provided with a centrally arranged longitudinally extending opening 54, the outer end of which has a suitable valve seat 46. This valve casing 40 is angular in cross-section and has an enlarged opening 47, which is also angular in cross-section. A valve 48 has a leather face 49 for engaging the valve seat 46, and the valve has a

valve stem 50 extending through the longitudinal opening of the case and is provided with external screw-threads 51. An adjustable nut 52 meshes with the screw-threads of the valve stem and is angular in outline to correspond with the angular shape of the opening 47. The outer face of the nut 42 is provided with a notched dial 53 and the valve 48 is provided with a pointer 54. A suitable spiral spring 55 is located between the adjustable nut 52 and the bottom of the enlarged opening 47.

In operation, when the pistons are moved either in or out, the strength of pull required is determined by the force required to force the air from the cylinders through the valves A. This is regulatable by turning the pointer 54, which turns the valve and its stem and will either loosen or tighten the spring 55 and thereby regulate the amount of air-pressure required to lift the valve from its seat and permit air to escape from either end of the cylinder, according to the direction of movement of the piston. The expansion of the spring 55 is such that when the pointer is at 5 on the dial, it will require a pull or push equal to the lifting of five pounds, and so on as the pointer is moved around the dial. The movement of the pointer from notch to notch indicates an adjustment of the pull equal to two pounds. By this arrangement the user can regulate the power or strength required to move the pistons in their cylinders and this can be regulated to require more or less pull for pushing the pistons than for pulling them out, and vice versa. Furthermore, the user in beginning with the apparatus for physical development, will set the pointers at the places on the dial adapted to his physical strength. In the use of this apparatus from day to day, the user can advance the pointers notch at a time to keep pace with his physical development from the use of the apparatus, and at the same time will be able to observe the progress of his physical development and to determine his strength when desired in operating the pistons in their cylinders.

When the apparatus is used solely for physical development, the helmet and tube 8 will be removed from the housing nipple 7, and a valve similar to the valves A will be screwed into the nipple 7. By this arrangement the suction actions of the pistons can be regulated in the same manner as the air escaping pressure is regulated by the valves A.

With the helmet attached as shown in Figs. 1 and 3, when the pistons are moved outward, a suction within the helmet is caused through the valve controlled openings 37, and when the pistons are moved inward, a suction is caused within the helmet through the valves 30, at the ends of the

pipes 22 and 22'. Also when the pistons are moved outward, the valves 30 are closed, so that air can escape from the outer end of the cylinder only through its adjustable valve A. Likewise, when the pistons are moved inward, the valves 38 are closed so that air can escape from the inner ends only through the adjustable valves A, at that end of the cylinder.

10 When an adjustable valve, like the adjustable valves A is used, in the place of the helmet, it will be attached in reversed position, as shown at A', Fig. 2, and is capable of regulation through the medium of the nut which is adjustable on its stem, as described in connection with the adjustable valves A.

15 In this way my apparatus is capable of the conjoint action of scalp treatment and physical or muscular development of the user, or may be used solely as an exercising device for muscular development of the user.

20 Having thus described my invention, what I claim and desire to secure by Letters Patent is:—

25 1. An apparatus of the type described, comprising a central housing, two oppositely extending cylinders having their adjacent ends connected to the said housing, the cylinders having heads in their adjacent ends, valved outlet openings communicating the housing with the cylinders, a passageway outside of the cylinders having its ends communicating with the outer ends of the cylinders and its center communicating with the housing, the ends of the passageway having inwardly operating valves, pistons within the cylinders, and piston rods extending through the outer ends of the cylinders to be operated by the hands of the user.

30 2. An apparatus of the type described, comprising two cylinders having closed inner ends adjacent each other, a housing embracing and connecting the inner ends of the cylinders, the inner heads of the cylinders having valved inlet openings, a pipe outside of the cylinders and extending longitudinally of the cylinders with its ends communicating with the outer ends of the cylinders, inlet valves controlling the ends of the pipe, the pipe having an intermediate communication with the said housing, pistons within the cylinders and piston rods extending through the outer ends of the cylinders and carrying operating handles, the parts operating as described.

35 3. An apparatus of the type described, comprising a housing, two cylinders having closed inner ends communicating with the housing, said cylinder inner ends having valved inlet openings, a pipe having its ends connected with the outer ends of the cylinders, the ends of the pipe having valves opening into the cylinders, each end of the

cylinders having pressure controlled outlet valves, pistons within the cylinders and piston rods extending through the outer ends of the cylinders by which the pistons are reciprocated, the parts combined for the purpose described.

4. An apparatus of the character described, comprising a housing, two cylinders having closed inner ends, connected with the said housing in separated relation, the closed ends having valved inlet openings, a pipe having its ends communicating the outer ends of the cylinders, inwardly moving valves controlling the ends of the pipe, the pipe having a central communication with housing, the housing having an inlet opening, pistons within the housing, and piston rods extending through the outer ends of the cylinders for operating the pistons.

5. An apparatus of the character described, comprising a housing, two cylinders having closed inner ends connected with the housing in spaced relation, the ends of the cylinders having valved inlet openings, the ends of the pipe having valves opening into the cylinders, outlet openings for each end of each cylinder, pressure controlled valves for the outlet opening, pistons within the cylinders, piston rods extending through the outer ends of the cylinders for operating the pistons, said housing having an outlet opening in communication with the pipe intermediate its ends, and the housing having an inlet opening, the parts combined for the purpose described.

6. An apparatus of the character described, comprising a housing, two cylinders having closed inner ends connected with the housing in spaced relation, said closed ends having valved inlet openings, a pipe having its ends connected with the outer ends of the cylinders, the ends of the pipe having valves opening into the cylinders, each cylinder having at each end an outlet passage, pressure controlled valves for said outlet opening, the housing having an outlet opening communicating with the pipe intermediate its ends, the housing having also an inlet opening, and a helmet communicating with the said outlet opening.

7. An apparatus of the type described, comprising a housing, two cylinders having closed inner ends connected with the housing in spaced relation, the closed cylinder ends having valved inlet openings, a pipe having its ends communicating with the outer ends of the cylinders, inwardly opening valves controlling the ends of the pipe, pistons within the cylinders, piston rods extending through the ends of the cylinders for operating the pistons, each cylinder having at each end an outlet opening, a pressure controlled valve for each of the outlet openings and means for controlling the pressure

on the outlet valves to regulate the air pressure within the cylinders for increasing or decreasing the power required to move the pistons.

5 8. In a construction such as defined in claim 4, the pressure controlled outlet characterized by a casing projecting through the cylinder wall, the valve having a stem with a screw-threaded inner end, a nut on the
10 threaded end of the stem, a spring within the casing and between its bottom and the nut, the outer end of the valve having means for rotating it and increasing or decreasing the pressure of the spring, for the purpose
15 described.

9. In a construction such as defined in claim 4, the outlet characterized by a casing

extending through the wall of the cylinder to the outside thereof, the casing having a spring receiving chamber, the inner end of 20 the valve stem screw-threaded, a nut on the threaded part of the stem, the nut held against rotation by engagement with the casing, an expanding spring between the nut and the bottom of the casing, the valve carrying a pointer for rotating it and its stem 25 to cause the nut to increase or decrease the pressure of the spring on the valve, and a dial indicating the position of the pointer and the pressure required to unseat the 30 valve, for the purpose described.

In testimony whereof I hereunto affix my signature.

THOMAS McCONNELL.