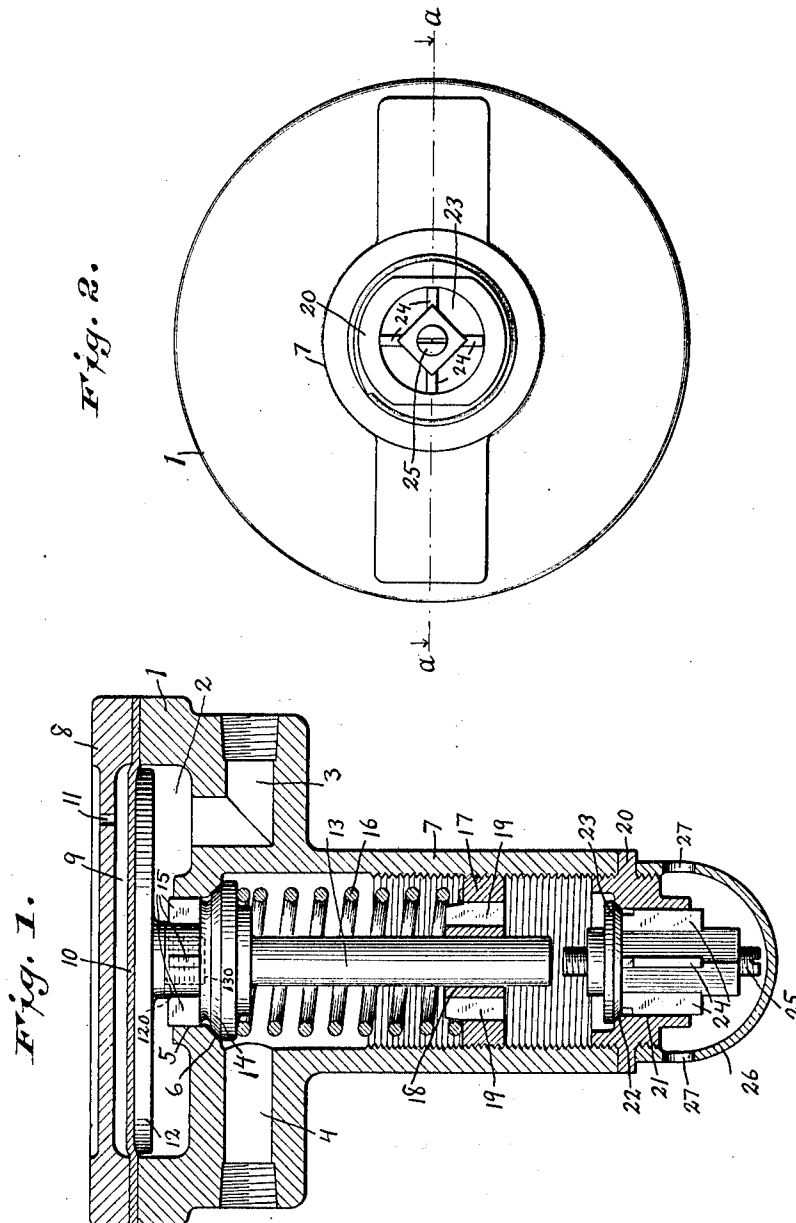


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AUXILIARY CONTROLLER.
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UNITED STATES PATENT OFFICE.

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1,022,407.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ROBERT CRAMER, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Auxiliary Controllers, of which the following is a specification, reference being had to the accompanying drawing, forming a part thereof.

This invention relates to an auxiliary controller for governing the operations of a main controller, as, for example, controllers used in connection with vacuum cleaning systems or the like.

The objects of the invention are to provide an auxiliary controller which is simple in construction and not liable to get out of order, which has few parts, and which is adapted to connect the main control with a part of the system in which a vacuum exists, or cut off such communication and restore normal atmospheric pressure at the main control.

Referring to the drawings which accompany this specification and form a part thereof, and on which drawings the same reference characters are used to designate the same elements wherever they may appear in each of the several views and which drawings illustrate an embodiment of this invention Figure 1 is a vertical section of the auxiliary controller taken on the line *a-a*, of Fig. 2; Fig. 2 is a bottom plan view of the auxiliary controller, the dust and guard cap being omitted.

Referring specifically to the drawings, the reference numeral 1 designates a casing provided with a chamber 2 in its top, a bore 3 affording communication from a pipe connection, not shown, with said chamber 2, a bore 4 affording communication with a pipe connection, not shown, and said chamber 2 by means of the port 5 provided with the valve seat 6. The casing 1 is provided with a projection 7, preferably formed as an integral part of said casing 1, and the projection 7 is hollow and is provided with screwthreads upon its internal surface, as clearly shown by Fig. 1 of the drawings. A cap 8 provided with a chamber 9 is adapted to be secured to casing 1 with a pressure actuable member separating chambers 2 and 9, as, for example, a diaphragm 10 secured between cap 8 and casing 1, as clearly shown by Fig. 1 of the drawings. Cap 8

is provided with an aperture 11 to allow free communication between the external atmosphere and the chamber 9 in cap 8 above diaphragm 10. A head or piston 12 is received within chamber 2 and upon this head the diaphragm 10 rests. This head 12 contacts with a stem 13, as shown, and has a projection 120 received within a recess 130 in the end of stem 13 to keep it in alinement therewith. Upon stem 13 is arranged an exhaust valve 14 and guides 15. The function of valve 14 is to seat against the valve seat 6 and to close communication between bore 4 and chamber 2, or by being removed from its seat, to establish communication between bore 4 and chamber 2. A spiral spring 16 surrounds stem 13 and bears at one end against valve 14 and at its opposite end against an adjustable follower 17, which is screwthreaded on its exterior so that it can be screwed in or out of projection 7 to adjust the tension on spring 16 in a manner which will be readily understood. The stem 13 projects through an aperture 18 in follower 17 and is guided thereby and by guides 15 so that valve 14 is maintained in axial alinement with port 5 and valve seat 6. The follower 17 is provided with apertures 19 so that air can pass freely through said follower, and said apertures are also useful to receive a tool to screw said follower in or out to adjust the tension of spring 16.

The lower end of projection 7 is closed by a cap 20 which screws into said lower end, and cap 20 is provided with a port 21 and valve seat 22 and within said port 21 is received the inlet valve 23, which is adapted to seat against said valve seat 22 and close the thoroughfare through said port 21. The valve 23 is provided with guides 24 which maintain said valve in axial alinement with port 21 and adjustable means as, for example, an adjusting screw 25 extends through a screwthreaded aperture in valve 23. The function of this screw 25 is to adjust and regulate the amount of opening permitted to either valve 14 or valve 23.

A cap 26 is screwed on to the cap 20 to make the appearance of the auxiliary controller more sightly and to prevent tampering with screw 25, and this cap 26 is provided with apertures 27 affording free communication between the atmosphere and the interior of the cap.

The function and operation of the con-

troller is as follows: When the parts are in the position shown by Fig. 1 of the drawings, with valves 14 and 23 closed, the chamber 2 is in communication with some part
 5 of the system in which a vacuum is being created, and as the pressure is lowered in the system and in chamber 2, the pressure of the atmosphere in chamber 9 is tending to force diaphragm 10, head 12, valve 14 and stem
 10 13 downwardly against the tension exerted by spring 16. When the difference in the pressures on opposite sides of diaphragm 10 is sufficiently great, the atmospheric pressure in chamber 9 will force diaphragm 10 and
 15 head 12 down against the tension of spring 16, thereby putting chamber 2 into communication with bore 4, and the air in bore 4 and connections, not shown, will be exhausted, so that the same intensity of vacuum
 20 will exist in bore 4, chamber 2 and bore 3. As diaphragm 10 is moved downwardly the stem 13 strikes against the end of screw 25, so that the extent of movement of valve 14 is limited, and valve 23 is prevented from opening upwardly by the atmospheric pressure on the outside thereof.
 25 When now from any cause (normally the use of the system) the pressure in bore 3, chamber 2, etc., increases, spring 16 will force valve 14 against its seat 6, thereby cutting off communication between bore 4 and chamber 2, and as less than atmospheric pressure exists in bore 4 and the interior of projection 7, valve 23 will be lifted from
 30 its seat by atmospheric pressure and atmospheric pressure will be restored in bore 4 and the communications, not shown. When atmospheric pressure has been reestablished in bore 4 and the connections, not shown,
 35 valve 23 will return to its seat by gravity.

What is claimed is:

1. The combination in an auxiliary controller of a casing provided with a chamber and having bores and a valve port, the first
 45 of said bores communicating directly with said chamber and the second of said bores communicating with said chamber through said valve port, a pressure actuatable member, a valve to control said valve port and adapted to be actuated by said pressure actuatable member on a decrease of pressure in
 50 said chamber to open said valve port to establish communication between said bores, and a valve adapted to open to admit air at atmospheric pressure into said second bore when communication between said bores is closed by said first mentioned valve.

2. The combination in an auxiliary controller of a casing provided with a chamber, a hollow projection, a bore communicating
 60 directly with said chamber, a second bore and a port affording communication between said chamber and said second bore and the interior of said hollow projection, a pressure actuatable member in said chamber, a
 65 valve, to control the thoroughfare through said port, adapted to be moved in one direction by said pressure actuatable member, a spring to move said valve in the opposite direction, and a valve to admit air to said
 70 hollow projection and said second bore.

3. The combination in an auxiliary controller of a casing provided with a chamber, a hollow projection, a bore communicating
 75 directly with said chamber, a second bore and a port affording communication between said chamber and said second bore and the interior of said hollow projection, a pressure actuatable member in said chamber, a valve to control the thoroughfare through said
 80 port, adapted to be moved in one direction by said pressure actuatable member, a spring to move said valve in the opposite direction, a valve to admit air to said hollow projection and said second bore, and adjustable
 85 means to limit the extent of movement of said valves.

4. The combination in an auxiliary controller of a casing provided with a chamber, a hollow projection, a bore communicating
 90 directly with said chamber, a second bore and a port affording communication between said chamber and said second bore and the interior of said hollow projection, a pressure actuatable member in said chamber, a valve, to control the thoroughfare
 95 through said port, adapted to be moved in one direction by said pressure actuatable member, an adjustable spring to move said valve in the opposite direction, a valve to admit air to said hollow projection and said
 100 bore, and an adjustable screw carried by one of said valves, the other of said valves being provided with a stem, said screw and said stem being in alinement, whereby said screw
 105 limits the movements of said valves and whereby when one valve is open it keeps the other valve closed.

In witness whereof I hereto affix my signature in presence of two witnesses.

ROBERT CRAMER.

Witnesses:

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