P. L. CRON.

PNEUMATIC PLASTERING MACHINE.

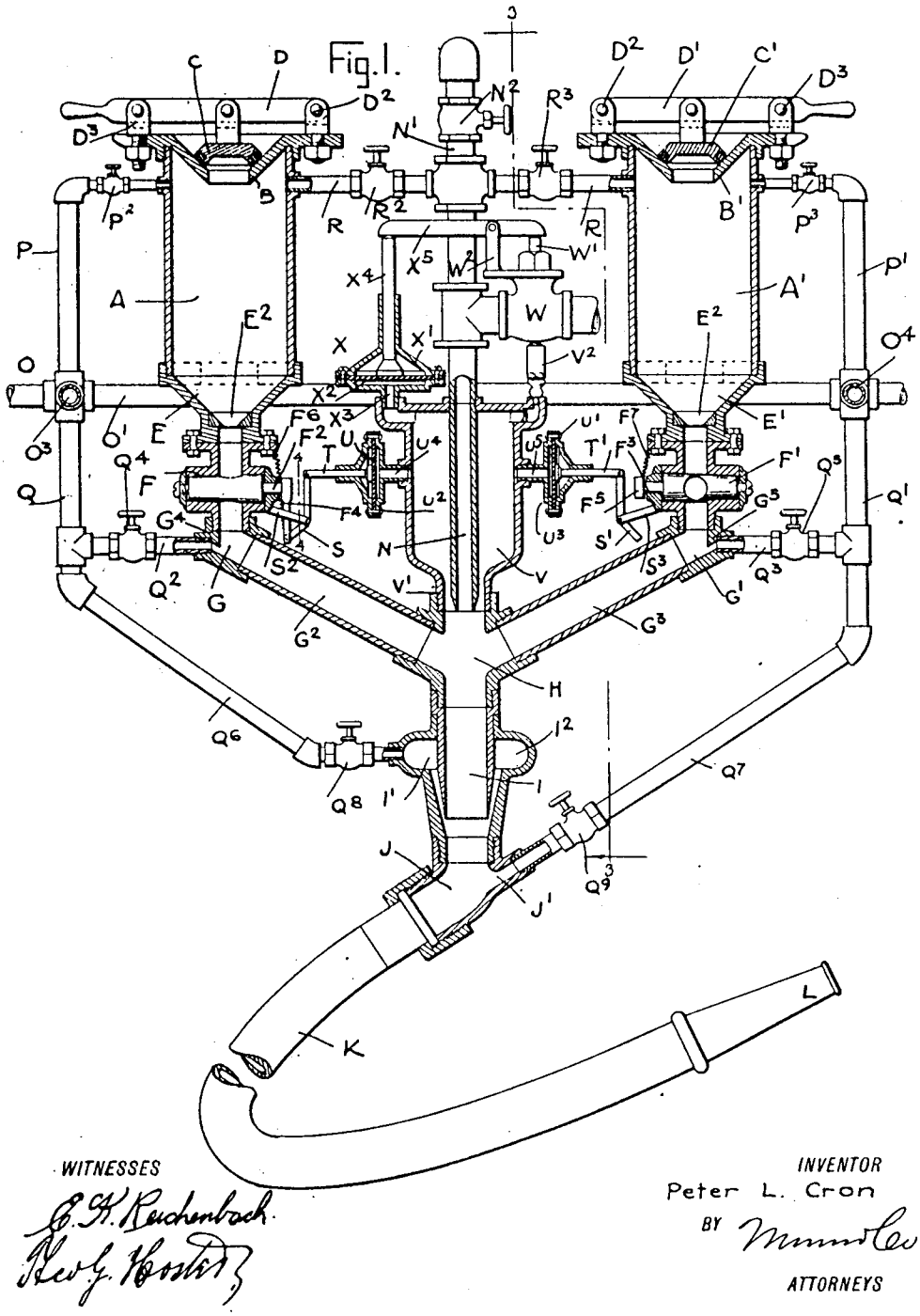
APPLICATION FILED JUNE 5, 1912.

1,053,014.

Patented Feb. 11, 1913.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 2.

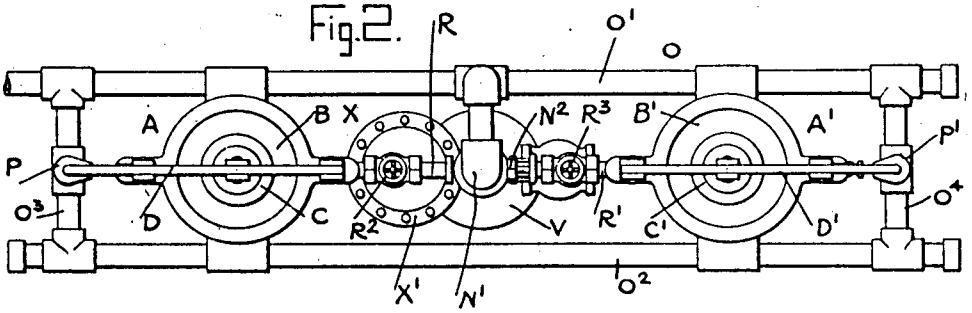


Fig. 3.

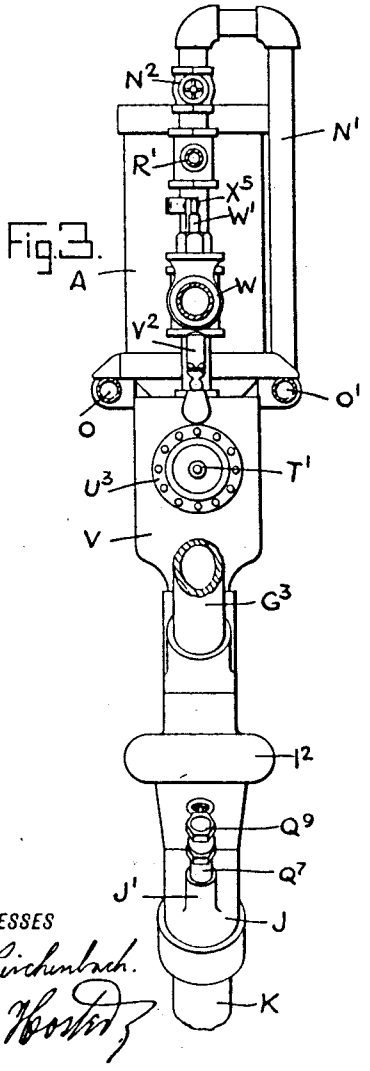
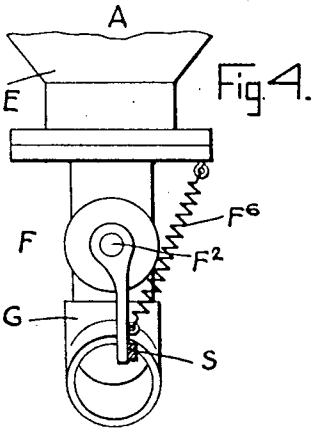


Fig. 4.



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PNEUMATIC PLASTERING-MACHINE.

1,053,014. Specification of Letters Patent. Patented Feb. 11, 1913.

Application filed June 5, 1912. Serial No. 701,795.

To all whom it may concern:

Be it known that I, PETER L. CRON, a citizen of the United States, and a resident of Elizabeth, in the county of Union and State of New Jersey, have invented a new and Improved Pneumatic Plastering-Machine, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved pneumatic plastering machine arranged to insure the proper delivery of a plastic mass, such as plaster, to a distant point, to permit of cleaning the pipe connections, and to allow the operator in charge of the applying nozzle to automatically shut off the supply of the plastic mass, and to readily signal to the operator in charge of the machine in case the plastic mass from one supplying chamber is exhausted so that another supplying chamber can be connected up to supply more plastic material and to avoid delay in supplying the plastic mass where needed.

For the purpose mentioned use is made of two chambers, each adapted to contain a plastic mass and provided with an outlet, tubular connections leading from the outlet to an applying nozzle for discharging the plastic mass onto a surface to be plastered, a source of pressure supply and a series of jet pressure devices connected with the said source of pressure supply and connecting with the said tubular connections to impart propelling impulses successively to the mass to force the latter in a continuous stream through the said tubular connection and to and through an applying nozzle held on the end of the tubular connection.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a sectional side elevation of the pneumatic plastering machine, parts being shown in elevation; Fig. 2 is a plan view of the same; Fig. 3 is a cross section of the same on the line 3—3 of Fig. 1; and Fig. 4 is an enlarged cross section of one of the outlet valves and the releasing mechanism therefor, the section being on the line 4—4 of Fig. 1.

As shown in the drawings, two vertically-disposed chambers or reservoirs A and A′ are employed for containing plastic material, such as plaster, in a moist, semi-fluid state, and the chambers are provided at their upper ends with hopper-shaped filling heads B, B′ for guiding the mass or material into a corresponding chamber without filling the same, and the said heads B and B′ are adapted to be hermetically closed, after the chambers are filled, by covers C, C′ hung on levers D, D′ fulcrumed at D^2 on the corresponding head B or B′. A locking bolt D^3 engages each lever D, D′ near its free handle end to securely fasten the corresponding lever in place and to firmly press the cover C or C′ in engagement with the head B or B′. Each cover C, C′ is provided with a gasket of rubber or other material to prevent leakage of air from the vessel A or A′ by way of the head B or B′.

The vessels A, A′ are provided at their lower ends with hopper-shaped bottoms E, E′ having removable and interchangeable outlet spouts E^2 provided with different openings so as to allow of discharging plaster in a thicker or thinner stream from the corresponding chamber A or A′. On the bottoms E, E′ are secured valves F, F′, of which one is open while the other is closed, as shown in Fig. 1, so that the material or plastic mass from one of the chambers A or A′ is used at the time for plastering purposes, as hereinafter more fully explained. The valves F and F′ are connected at the outlet side with pipe fixtures G, G′ connected with angularly-disposed pipes G^2, G^3, leading to a cross-shaped pipe fixture H at opposite sides thereof so that the pipes G^2, G^3 diverge from the said cross-shaped pipe fixture H, as will be readily understood by reference to Fig. 1. The lower end or the underside of the cross-shaped pipe fixture H is provided with a nozzle I surrounded by a pressure chamber I′ attached at its upper end to the nozzle I, and to the lower end of the said pressure chamber I′ is secured an angular pipe fixture J to which is coupled or otherwise fastened one end of a hose K of any desired length and terminating in an applying nozzle L for applying the plaster or other plastic material to a wall or other surface to be plastered.

Into the upper end of the cross-shaped pipe fixture H discharges a jet pipe N con-

nected at its upper end with a pipe N′ connected with a pipe O′ forming part of the supporting frame O of the machine and which supporting frame O is formed, besides the side pipe O′, with a second side pipe O^2 and end cross pipes O^3 and O^4, as plainly indicated in Fig. 2. One of the side pipes (as shown, the side pipe O′) is connected with a suitable source of pressure supply, such as compressed air from the jet pipe N against the mass passing into the pipe fixture H from the pipes G^2 and G^3. The pipe N′ is provided with a valve N^2 for controlling the amount of compressed air passing to the jet pipe N for shutting off the supply of compressed air whenever it is desired to do so. The cross pipes O^3 and O^4 are connected by pipe P, P′ having valves P^2 and P^3 connected with the upper ends of the chambers A, A′ to supply the said chambers with compressed air to force the mass out of the chambers and down through the valve F or F′ open at the time. Pipes Q and Q′ are provided with branch pipes Q^2, Q^3 having valves Q^4, Q^5, and opening into the pipe fixtures G and G′ directly under the deflector points G^4, G^5 formed in the said pipe fixtures, to deflect the compressed air passing through the pipes Q^2 or Q′, Q^3 in a downward direction, that is, in line with the length of the pipes G^2 or G^3. The pipes Q and Q′ are further provided with branch pipes Q^6 and Q^7 having valves Q^8 and Q^9, of which the pipe Q^6 opens into an annular chamber I^2 of the pressure chamber I′, and the pipe Q^7 opens into an offset J′ formed on the upper end of the pipe fixture J. Thus when a valve Q^4 or Q^5 is open at the time the corresponding valve F or F′ is open then the compressed air passing through such pipe acts on the material passing through the pipe fixture G or G′ to assist in causing the material to flow down the pipes G^2, G^3 into the pipe fixture H in which the material receives a main, forward impelling impulse by the compressed air passing through the jet pipe N. The material is thus forced down through the nozzle, and a further impulse is given to the material by the pressure from the pressure chamber I supplied with pressure through the pipe Q^6, so that the material is forced downward into the pipe fixture J and the hose K, and another impulse is given to the material or mass by the compressed air passing by way of the pipe Q^7 and the offset J′ into the pipe fixture J in the direction of the outlet thereof. Thus from the foregoing it will be seen that a number of impulses are given to the material or mass to force the same from the chamber A or A′ to the nozzle L, which may be a desired distance from the point at which the machine is located. The upper end of the chambers A and A′ are connected by pipes R R′ with the pipe N′, and the said pipes R, R′ are provided with relief valves R^2, R^3 adapted to open on excess of pressure in the chambers A, A′ to allow such surplus pressure to pass into the pipe N′ and to the jet pipe N.

The valves F and F′ are self-closing, and each is adapted to be held in open position during the time that the corresponding chamber A or A′ is employed for supplying plastic material to the nozzle L. For the purpose mentioned the valves F and F′ are in the form of turnable conical plugs, as plainly shown in Fig. 1, and on the stems F^2, F^3 of the said valves are secured arms F^4, F^5 connected with springs F^6, F^7 for moving the valves F and F′ into closed position. When the valve F or F′ is in closed position the arms F^4 or F^5 stand in a horizontal position, and when it is desired to open the valve F or F′ the operator takes hold of the arm F^4 or F^5 and swings the same downward into vertical position to open the valve, as shown relative to the valve F in Fig. 1. The arm F^4 or F^5 when in vertical position is adapted to be engaged by one end of a lever S or S′ to hold the valve in open position against the tension of the spring F^6 or F^7, and the levers S, S′ are fulcrumed on brackets S^2, S^3 projecting from the casings of the valves F, F′. The levers S and S′ are pivotally connected with stems resting on the outer faces of the diaphragms U, U′ held in casings U^2, U^3 connected by pipes U^4, U^5 with a vacuum chamber V surrounding the jet pipe N and attached to the upper end of the cross-shaped pipe fixture H. It is understood that the pipes U^4, U^5 extend from the inner sides of the casings U^2, U^3 so that when back pressure is produced in the vacuum chamber V the diaphragms U and U′ are caused to move outward away from each other to move the stems T, T′ in a like direction whereby the corresponding lever S or S′ is given a swinging motion to disengage said lever from the corresponding arm F^4 or F^5 to allow the valve F or F′ to close by the action of its spring F^6 or F^7. The vacuum chamber V has a contracted end V′ at the discharge end of the jet pipe N so that when the machine is in use and compressed air passes through the jet pipe N to force the plaster through the nozzle L, as previously mentioned, then a suction is produced in the suction chamber V and consequently the diaphragms U and U′ are held in innermost position and the lever S or S′ can hold the arm F^4 or F^5 locked in vertical position with the valve F or F′ in open position.

The vacuum chamber V is provided with a whistle or other alarm V^2 adapted to be sounded by back pressure within the chamber V, as hereinafter more fully explained.

An emergency pressure valve W is connected with the pipe N′ and with a source of compressed air, and normally this valve W is in a closed position but is adapted to be opened by back pressure within the vacuum chamber V through the medium of a diaphragm pressure device X provided with a housing X′ containing a diaphragm X^2 and connected at its under side by a pipe X^3 with the vacuum chamber V. On the upper side of the diaphragm X^2 is held a stem X^4 mounted to slide in the housing X′, and the said stem engages one end of a lever X^5 in contact with the valve stem W′ of the emergency pressure valve W so as to open the valve W whenever back pressure in the vacuum chamber V causes the diaphragm X^2 to move upward and with it the stem X^4. It is understood that when this takes place a swinging motion is given to the lever X^5 to press the valve stem V′ downward and thus open the emergency pressure valve W. The lever X^5 is pivoted on a bracket W^2 held on the casing of the valve W.

The operation is as follows: When both chambers A and A′ are filled with plaster in plastic condition then the operator in charge of the machine opens the valve F and locks the same in open position by engagement of the lever S with the arm F^4, as shown to the left in Fig. 1. The valves N^2, P′, Q^4, Q^8 and Q^9 are then opened so that compressed air can pass through the jet pipe N to produce a vacuum in the chamber V and a jet action in the fixture H to draw the plaster down through the open valve F and the pipe G^2 into the fixture H, the flow of the plaster being aided by the pressure in the top of the chamber A supplied by way of the pipe P, and the flow being aided in the pipe G^2 by the pressure entering under the deflector point G^4 by way of the pipe Q^2. The plaster by the action above described is forced from the pipe fixture H into the nozzle I and through the latter into the fixture J and into the hose K and applying nozzle L to be supplied to the surface to be plastered, it being understood that the flow of the plaster is aided by pressure from the pressure chamber I′ and the compressed air entering the fixture J by way of the pipe Q^7. The operator in charge of the nozzle L can automatically shut off the supply of plaster by bending the hose K adjacent the nozzle L so that a back pressure is produced in the vacuum chamber V and consequently the valve F is automatically released and moves into closed position thus shutting off the supply of plaster from the chamber A. If it is desired to again proceed with the plastering operation it is necessary for the operator in charge of the machine to reopen the valve F and to lock the same in open position by the lever S, as a vacuum is again produced in the chamber V owing to the outflow of the material to the nozzle L. In case the chamber A is emptied of its contents then the operator in charge of the nozzle L makes a kink in the hose K so that the valve F is automatically closed as above described by the back pressure in the vacuum chamber V, and the alarm V^2 is also sounded so that the operator in charge of the machine now opens the valve F′ and locks the same in open position by engaging the lever S′ with the arm S^5, and the valves P^2 and Q^5 are opened to supply pressure to the upper end of the chamber A′ and to the fixture G′, the valves Q^3 and Q^9 remaining open while the valves Q^4, P′ are preferably closed. The above-described operation is now repeated, that is, the contents of the chamber A′ are delivered to the nozzle L for plastering the desired surface. During the time the chamber A′ is in use the other chamber A can be refilled by opening the cover C, as previously explained. In case the hose K becomes clogged up by the material then the back pressure produced in the vacuum chamber V actuates the diaphragm X^2 whereby the emergency pressure valve W is opened to allow a heavy air pressure to pass into the jet pipe N to force out any obstruction that may be in the hose K.

Although the pipes Q^2 and Q^3 have been described as supplying compressed air to the fixtures G, G′ and as aiding the flow of material through the pipes G^2, G^3 the said pipes are, however, mainly used for supplying pressure when it is desired to clean out the pipes G^2, G^3 of any material that may be in the said pipes.

In practice, the frame O is preferably mounted on a truck to permit of conveniently wheeling the machine about.

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

1. A pneumatic plastering machine, comprising a chamber adapted to contain a plastic mass and provided with an outlet, a tubular connection leading from the said outlet to an applying nozzle for discharging the plastic mass onto a surface to be plastered, a source of pressure supply, a series of jet pressure devices connected with the said source of pressure supply and connecting with the said tubular connection to impart propelling impulses successively to the mass to force the latter in a continuous stream through the said tubular connection and to and through an applying nozzle, a self-closing device for the said outlet, and a pneumatic releasing device holding the said self-closing device normally in an open position, the said releasing device being connected with one of the said jet pressure devices to actuate the releasing device on closing the

said tubular connection to relieve the said self-closing device and to thus allow the latter to close the outlet.

2. A pneumatic plastering machine, comprising a chamber adapted to contain a plastic mass and provided with an outlet, a tubular connection leading from the said outlet to an applying nozzle for discharging the plastic mass onto a surface to be plastered, a source of pressure supply, a series of jet pressure devices connected with the said source of pressure supply and connecting with the said tubular connection to impart propelling impulses successively to the mass to force the latter in a continuous stream through the said tubular connection and to and through an applying nozzle, a spring-pressed valve in the said outlet, and a pneumatic releasing device normally holding the said valve in open position, the said releasing device being provided with a diaphragm, and a vacuum chamber connected with one of the said jet pressure devices to actuate the releasing device on closing the tubular connection to release the valve and to thus allow the latter to close.

3. A pneumatic plastering machine, comprising a chamber adapted to contain a plastic mass and provided with an outlet, a tubular connection leading from the said outlet to an applying nozzle for discharging the plastic mass onto a surface to be plastered, a source of pressure supply, a series of jet pressure devices connected with the said source of pressure supply and connecting with the said tubular connection to impart propelling impulses successively to the mass to force the latter in a continuous stream through the said tubular connection and to and through an applying nozzle, a pressure device connected with the said chamber to force the mass therein into the outlet, and a relief valve connected with the said chamber and connected with the source of pressure supply.

4. A pneumatic plastering machine, comprising a chamber adapted to contain a plastic mass and provided with an outlet, a tubular connection leading from the said outlet to an applying nozzle for discharging the plastic mass onto a surface to be plastered, a source of pressure supply, a series of jet pressure devices connected with the said source of pressure supply and with the said tubular connection to impart propelling impulses successively to the mass to force the latter in a continuous stream through the said tubular connection and to and through an applying nozzle, an emergency pressure valve connected with a source of pressure supply and with one of the said jet pressure devices, and a pneumatic actuating device for the said emergency pressure valve having a diaphragm and a vacuum chamber connected with the respective jet pressure device.

5. A pneumatic plastering machine, comprising a chamber adapted to contain a plastic mass and provided with an outlet having a self-closing valve, a tubular connection leading from the said outlet, a main pressure jet opening into the said tubular connection and connected with a source of pressure supply, a vacuum chamber surrounding the said jet and opening into the said tubular connection, a diaphragm connected at one face with the said vacuum chamber, and a locking and releasing device for the said outlet valve connected with the other face of the said diaphragm to release the valve on back pressure.

6. A pneumatic plastering machine, comprising a chamber adapted to contain a plastic mass, and provided with an outlet having a self-closing valve, a tubular connection leading from the said outlet, a main pressure jet opening into the said tubular connection and connected with a source of pressure supply, a vacuum chamber surrounding the said jet and opening into the said tubular connection, a diaphragm connected at one face with the said vacuum chamber, a locking and releasing device for the said outlet valve connected with the other face of the said diaphragm to release the valve on back pressure, and an alarm connected with the said vacuum chamber.

7. A pneumatic plastering machine, comprising a chamber adapted to contain a plastic mass and provided with an outlet having a self-closing valve, a tubular connection leading from the said outlet, a main pressure jet opening into the said tubular connection and connected with a source of pressure supply, a vacuum chamber surrounding the said jet and opening into the said tubular connection, a diaphragm connected at one face with the said vacuum chamber, a locking and releasing device for the said outlet valve connected with the other face of the said diaphragm to release the valve on back pressure, and an emergency pressure valve connected with the said main jet.

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

PETER L. CRON.

Witnesses:
JOHN R. JONES,
GEORGE C. OTTO.