M. WHITLATCH.

DRIER.

APPLICATION FILED MAY 23, 1908.

952,775.

Patented Mar. 22, 1910.

4 SHEETS—SHEET 1.

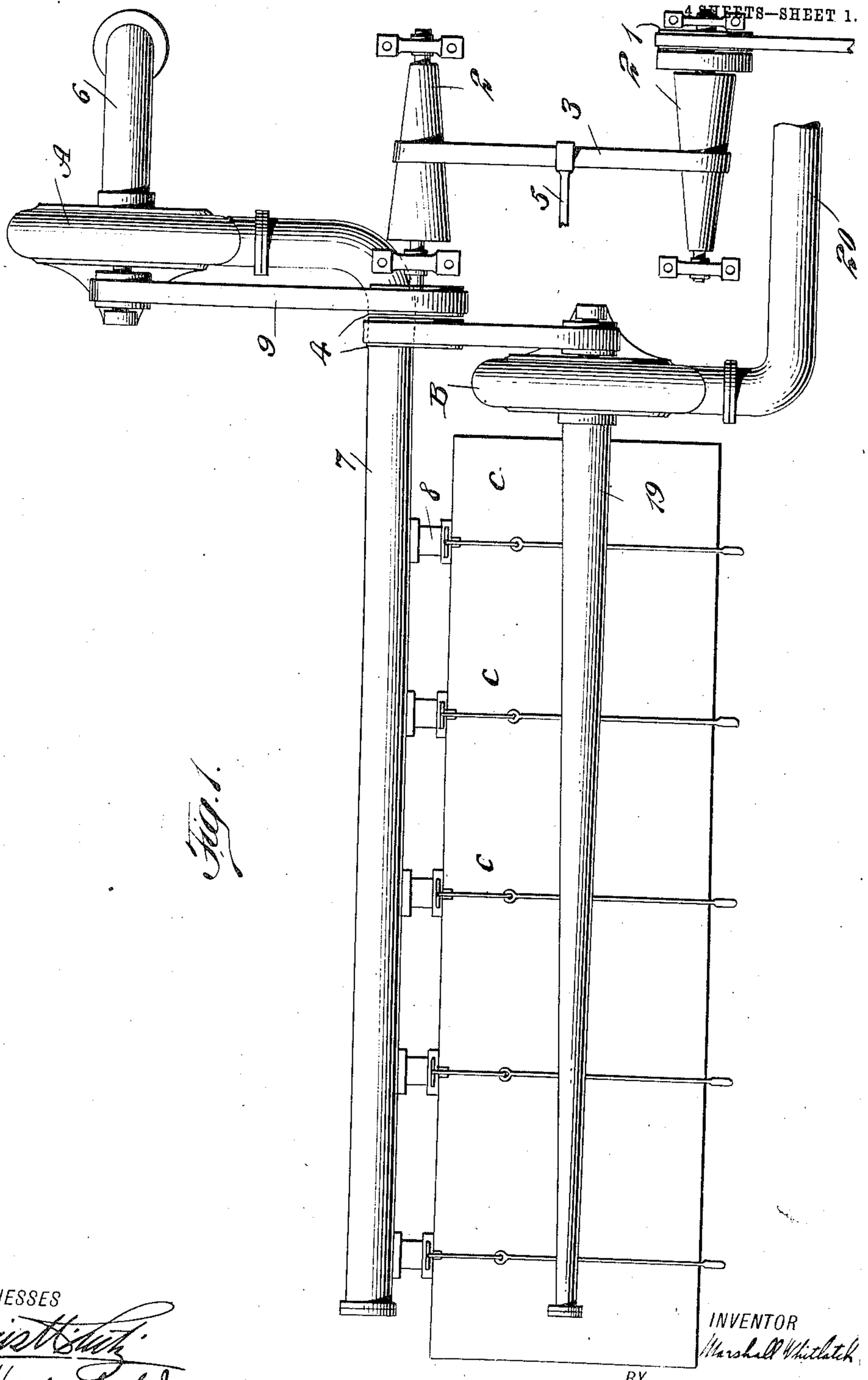


Fig. 1.

WITNESSES

Julius Hirsch

J. E. Hardenbergh, Jr.

INVENTOR

Marshall Whitlatch

BY

Gifford & Bull

ATTORNEYS.

M. WHITLATCH.

DRIER.

APPLICATION FILED MAY 23, 1908.

952,775.

Patented Mar. 22, 1910.

4 SHEETS—SHEET 2.

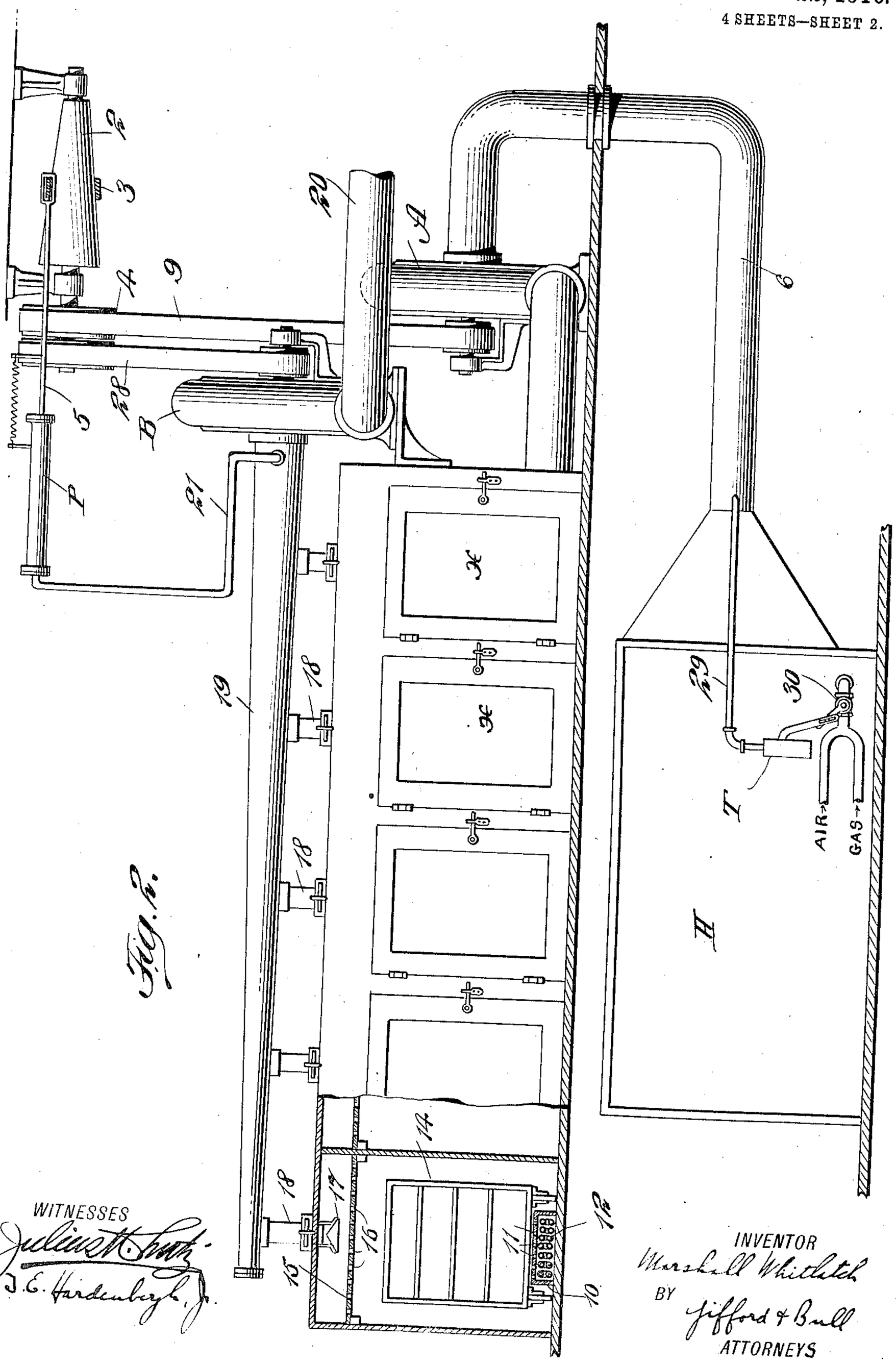


Fig. 2.

WITNESSES

Juliet H. Lutz

J. E. Hardenbergh, Jr.

INVENTOR

Marshall Whitlatch

BY

Jifford & Bull

ATTORNEYS

M. WHITLATCH.

DRIER.

APPLICATION FILED MAY 23, 1908.

952,775.

Patented Mar. 22, 1910.

4 SHEETS—SHEET 3.

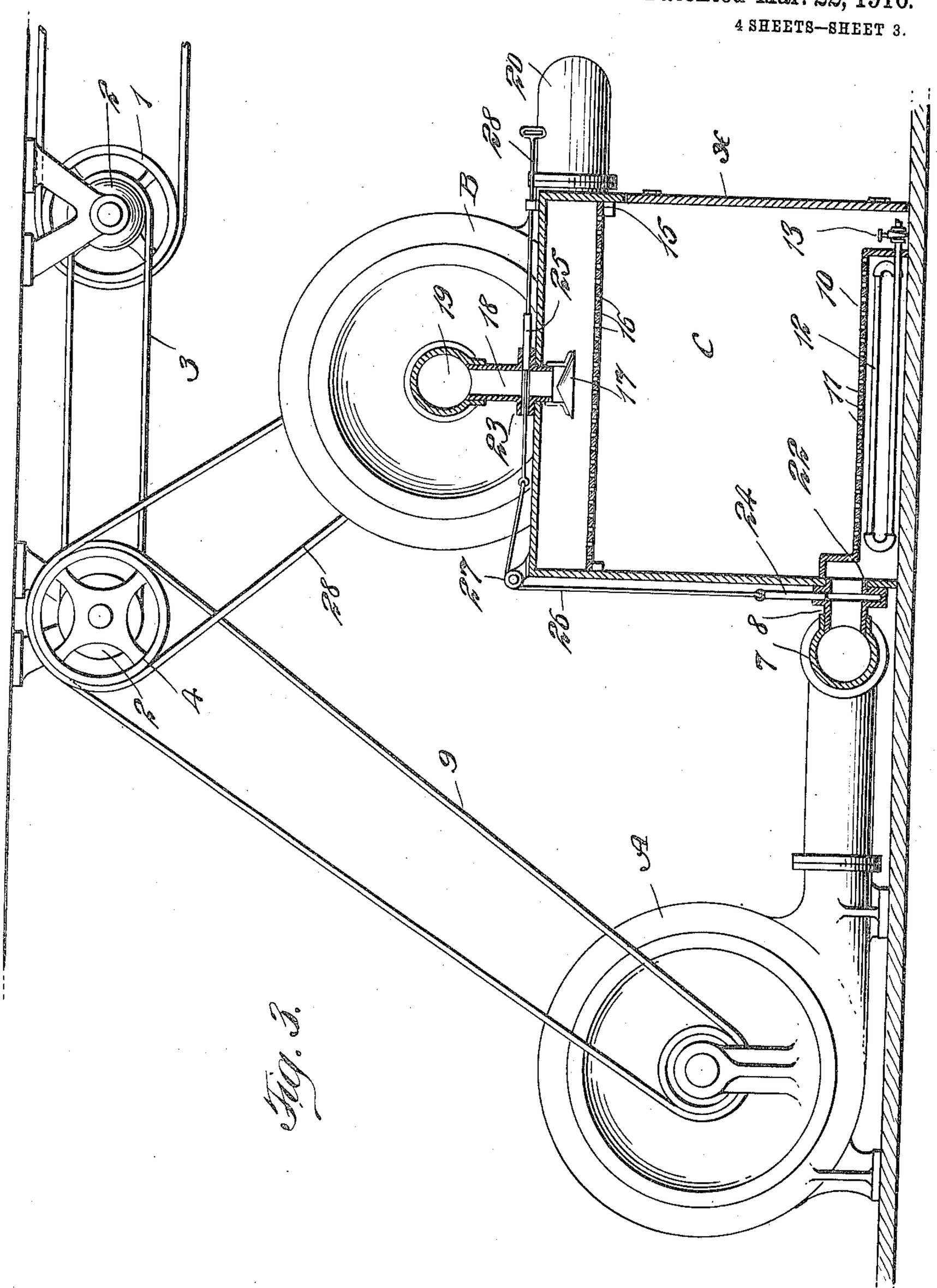


Fig. 3.

WITNESSES

Julius H. Hirtz

J. C. Hardenbergh, Jr.

INVENTOR

Marshall Whitlatch

BY Gifford & Bull

ATTORNEYS

M. WHITLATCH.

DRIER.

APPLICATION FILED MAY 23, 1908.

952,775.

Patented Mar. 22, 1910.

4 SHEETS—SHEET 4.

Fig. 4.

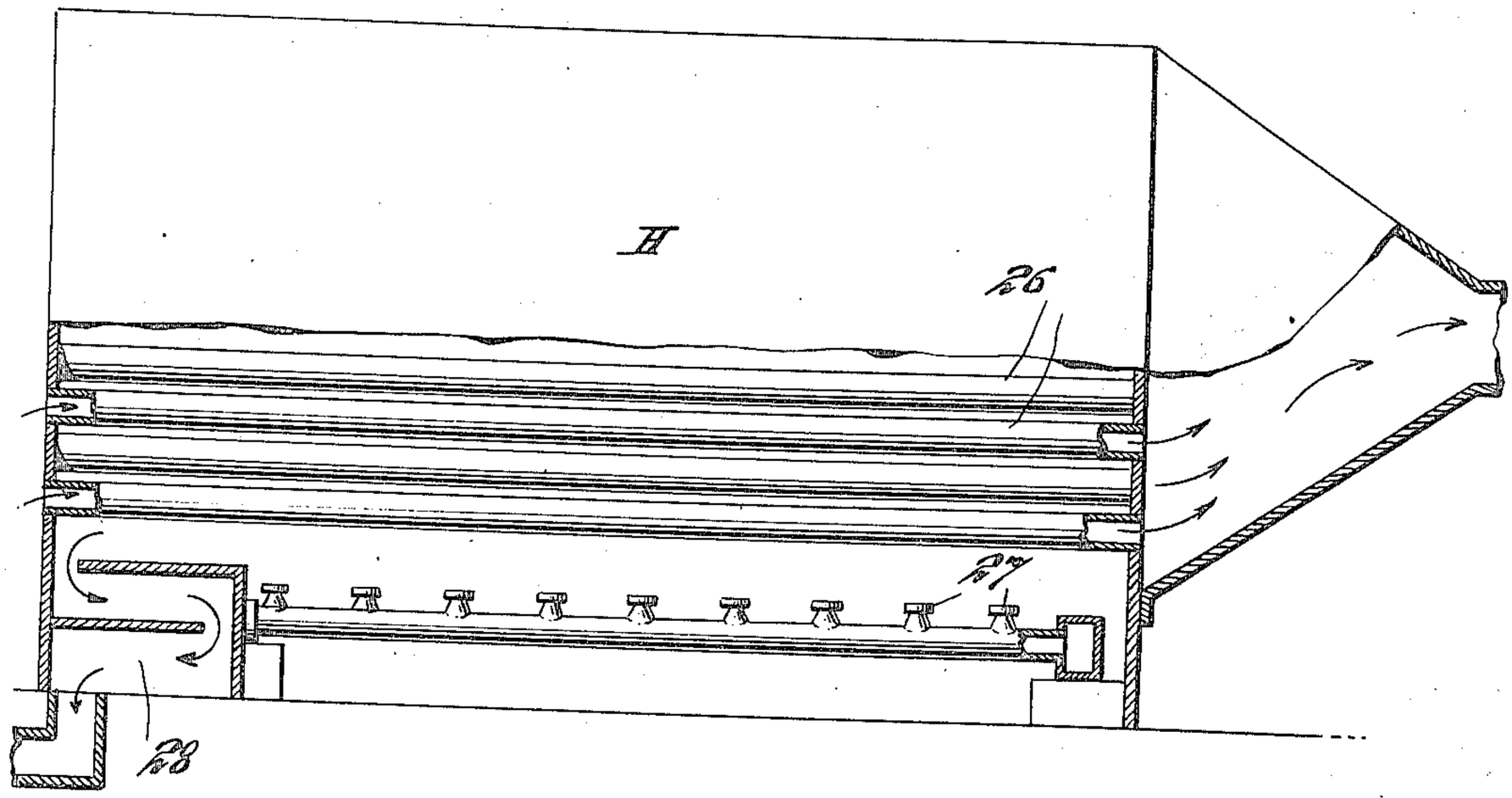
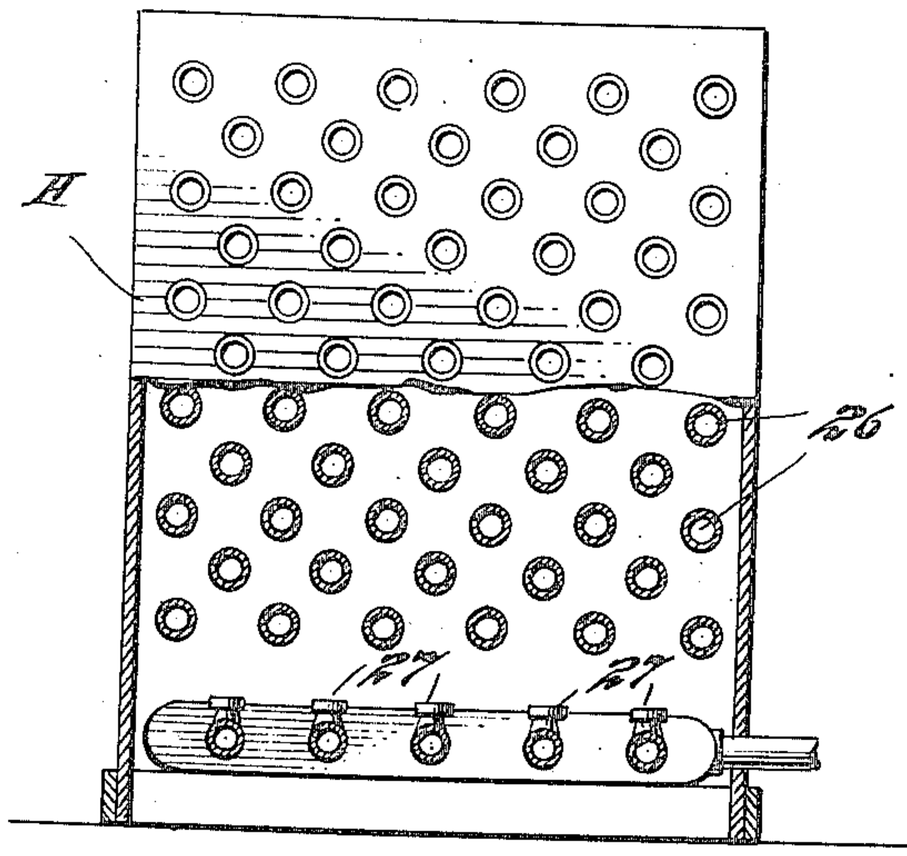


Fig. 5.



WITNESSES

J. E. Hardenbergh, Jr.

INVENTOR

Marshall Whitlatch

BY Gifford & Bull

ATTORNEYS

UNITED STATES PATENT OFFICE.

MARSHALL WHITLATCH, OF MONTCLAIR, NEW JERSEY, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE WHITLATCH COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

DRIER.

952,775. Specification of Letters Patent. Patented Mar. 22, 1910.

Application filed May 23, 1908. Serial No. 434,514.

To all whom it may concern:

Be it known that I, MARSHALL WHITLATCH, a citizen of the United States, and a resident of the city of Montclair, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Driers, of which the following is a specification.

My invention relates to that class of driers more especially adapted for use in the drying of materials such as furs, fabrics and the like. In the construction of such a drier it is essential that provision be made for the treatment of the material with a current of substantially unsaturated air preferably heated to a desired degree; such a current of air is at its maximum of efficiency as a drying medium upon entering the drying chamber, and such efficiency rapidly decreases as moisture is taken up from the wet material until a point is reached where the saturation of the air equals that of the material and there is an absence of drying effect. Should it be attempted to prolong the drying effect of the saturated air by further heating of the same, there results an inefficient and even injurious drying operation and a great danger of injury to the material treated by reason of the high degree of heat required.

It has been my purpose to provide a drier wherein material may be subjected to such a current of air at a predetermined temperature, under predetermined pressure and exhaust, and I have provided means whereby such temperature, pressure, and exhaust may be automatically kept constant under varying conditions of use, such as when it is only desired to use a portion of the drier, or to reduce the volume of air passing through a portion thereof, without any regulation by the operator of the air circulating or heating mechanism.

My invention presents, among other advantages, those of subjecting material to a constantly changing flow of unsaturated and purified air at a predetermined temperature and exhaust, automatic and simultaneous regulation of temperature, pressure and exhaust to retain the same constant, accessibility of drying chamber, simplicity of design, and ease of construction and operation at a low cost, as will hereafter be more particularly set forth.

In the following specification my invention will be more particularly described as used in the drying of furs or the like, but I do not wish to limit myself to such application, but to cover any use of my invention within the spirit thereof, such invention consisting in the design, construction, combination and operation of parts as set forth in and falling within the scope of the claims hereto appended.

In the accompanying drawings like characters of reference denote like parts in all the figures.

Figure 1 represents a plan view of my improved drier; Fig. 2 represents a side view of elevation of my improved heater, a portion thereof being shown in section; Fig. 3 represents a view in end elevation of my improved drier, a portion thereof being in section; Fig. 4 represents a view in side elevation of the heater portion of my improved drier, the lower portion thereof being in section; Fig. 5 represents an end view in elevation of the heater, a portion thereof being shown in section.

Turning now to a description of the figures in detail, the air circulating mechanism of my improved drier is driven through pulley 1 (connected to any desired source of power) cone pulleys 2 connected by belt 3, and main drive pulleys 4 mounted on the shaft of one of the cone pulleys 2. The belt 3 on cone pulleys 2 is connected by shifter bar 5 to a pressure regulating device as will hereafter be described.

A denotes a fan or blower adapted to draw air from the source of supply through pipe 6 and to force a current of air through the main supply pipe or header 7 connected to a series of compartments C, forming the drying chamber, by a branch pipe 8 extending through the rear wall of each of such compartments at the bottom thereof. The fan A is driven by belt 9 on one of the main drive pulleys 4. Within each compartment C and adapted to receive the air entering through pipe 8 is formed a distributing box 10, the top thereof being provided with perforations 11; within each box 10 is placed a supplemental heating coil 12 connected to any desired heat supply and each regulated by a hand valve 13. As shown the box 10 is comparatively narrow and located centrally of the compartment C to permit of the move-

ment in and out of a drying rack 14; but said box may be of any desired form or size.

Adjacent the top of each compartment C is placed a ceiling 15 provided with perforations 16, and above the ceiling 15 is a baffle-shield 17 secured to the bottom of the outlet pipe 18, the current of air passing around the shield into the pipe. The outlet pipes 18 are connected to the tapering exhaust pipe 19 which leads to the exhaust fan B, by which the air is withdrawn and discharged through pipe 20. Exhaust pipe 19 is connected, adjacent the fan B, by pipe 21 with pressure regulator P which in turn is connected with belt 3 by shifter bar 5. Fan B is driven by belt 28 on one of the main drive pulleys 4. The branch inlet pipes 8 and outlet pipes 18 are formed with enlarged portions 22 and 23 respectively, outside of the rear wall and roof of compartments C. A slide member 24 is inserted in the enlarged portion 22 of each inlet pipe 8 entering from the top and closing the outlet pipe when lowered; a slide member 25 is adapted to move in and out of enlarged portion 23 of each outlet pipe 18 to close and open said pipe. The slide members 24 and 25 are connected by the rope or chain 26 passing over the pulley 27 on the rear edge of the roof of each compartment 6 and by means of handle rod 28 connected at the front to the slide 25, both of said slides may be operated simultaneously to open or close the inlet and outlet pipes to any desired degree. Entrance to compartments C is effected through doors *x*.

In Figs. 4 and 5 are shown the preferred form of heater box H provided with pipes 26 through which the air enters and passes into the pipe 6 which connects with fan A. At the bottom of the heater box are the heater jets 27 (preferably gas,) connected to a common supply and adapted to heat the air as it passes through the pipes 26. The heating chamber of box 4 is provided with baffled outlet 28 to insure a circulation of the heating medium around the pipes 26.

Turning again to Fig. 2, it is seen that the pipe 6 is connected, adjacent its connection with heater box by pipe 29 with any desired form of thermostatic temperature regulator T adapted to control the supply of air and gas to the heater jets by means of valve 30. By means of this temperature-regulator T the temperature of the air admitted to the pipe 6 may be retained at any predetermined degree, irrespective of the volume of air passing into the pipe 6. For example, the temperature regulator having been set for a certain desired degree, should the volume of air passing into the pipe 6 be decreased, by regulation of the fan A, the supply of air will pass more slowly through pipes 26 and be heated to a higher degree than that desired, whereupon the regulator T will immediately operate to reduce the supply of air and gas to the heater jets 27 and to maintain the predetermined temperature constant. A reverse action will take place should the volume of air passing through the pipe 6 be increased.

The operation of the pressure regulator P, which may be of any desired well known form is as follows: The drive pulleys 1, 2 and 4 and their connecting belts are adapted to normally operate to drive fans A and B at such equal speeds as to simultaneously supply to and withdraw from each of the compartments C a certain desired volume of air at a predetermined pressure and exhaust; such operation being rendered possible by reason of the tapering form of the exhaust pipe 19 which uniformly increases in size as it is connected to successive compartments C approaching the exhaust fan B. By this form of construction the tendency of the fan B to draw a great volume of air through the compartment C which is nearest thereto and diminishing volumes through the other compartments in proportion as they are farther removed from the fan B, is overcome. A desired volume of air under predetermined pressure and exhaust being passed through all the compartments, should the inlet and outlet to one or more of said compartments be wholly or partially closed, the volume of air passing through the remaining compartments will be increased as will also the pressure in the pipe 19, whereupon the pressure regulator P through the shifter bar 5 will simultaneously adjust the belt 3 on the cone pulleys 2 to reduce the speed of the main drive pulleys 4 and fans A and B, and to maintain the predetermined pressure and exhaust constant. In like manner when the closed compartments are again opened the regulator P operates to increase the speed of the fans to the necessary extent. So also the door of any compartment may be opened as desired without interfering with the constant operation of the drier.

From the above description the operation of my drier will be readily understood and in brief is as follows: Furs, or other material to be dried, having been placed in all or certain of the compartments and heater H having been adjusted to heat the air to a certain predetermined degree, the fans A and B are set in operation to maintain a current of heated air through the compartments of desired volume under predetermined pressure and exhaust. The material in the compartments may be subjected for any desired length of time to the drying action of the unsaturated current of heated air, and one or any desired number of the compartments may be wholly or partially shut off, as desired, and the pressure regulator will maintain the predetermined supply of air under constant pressure and ex-

haust, while said supply will be maintained at a constant predetermined temperature irrespective of the volume of air being supplied to the drier. Should a greater degree of heat be desired in any one of the compartments the supplemental heating coil in such chamber may be operated by the use of the hand valve thereon.

By the use of my invention absolute flexibility of use of the drier is secured without hand regulation of temperature, pressure or exhaust.

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

1. In a drier, in combination, a chamber, means for causing a flow of air through the chamber under predetermined pressure and exhaust, and automatic means for maintaining the predetermined pressure and exhaust constant.

2. In a drier, in combination, a chamber, an inlet to said chamber, means for causing a flow of air through said chamber under predetermined pressure, means for controlling the flow of air through the inlet, and automatic means for maintaining the predetermined pressure constant irrespective of the control of the inlet.

3. In a drier, in combination, a chamber, an outlet to said chamber, means for causing a flow of air through said chamber under predetermined pressure, means for controlling the flow of air through the outlet, and automatic means for maintaining the predetermined pressure constant irrespective of the control of the outlet.

4. In a drier, in combination, a chamber, an inlet and an outlet for the chamber, means for causing a flow of air through the chamber under predetermined pressure, means for controlling the flow of air through the inlet, means for controlling the flow of air through the outlet, and automatic means for maintaining the predetermined pressure constant, irrespective of the control of the inlet and outlet.

5. In a drier, in combination, a chamber, an inlet to said chamber, means for causing a flow of air through said chamber under predetermined exhaust, means for controlling the flow of air through the inlet, and automatic means for maintaining the predetermined exhaust constant irrespective of the control of the inlet.

6. In a drier, in combination, a chamber, an outlet to said chamber, means for causing a flow of air through said chamber under predetermined exhaust, means for controlling the flow of air through the outlet, and automatic means for maintaining the predetermined exhaust constant irrespective of the control of the outlet.

7. In a drier, in combination, a chamber, an inlet and an outlet for the chamber, means for causing a flow of air through the chamber under predetermined exhaust, means for controlling the flow of air through the inlet, means for controlling the flow of air through the outlet, and automatic means for maintaining the predetermined exhaust constant, irrespective of the control of the inlet and outlet.

8. In a drier, in combination, a chamber, means for causing a flow of air of predetermined volume into the chamber, means for the withdrawal of air from the chamber adapted to operate at an equal capacity with said supply means, and automatic means for maintaining said predetermined volume of supply constant.

9. In a drier, in combination, a chamber, means for causing a predetermined volume of air to flow into the chamber, means for withdrawing an equal predetermined volume of air from the chamber, and automatic means for maintaining the predetermined volume of supply and withdrawal constant.

10. In a drier, in combination, a chamber, means for causing a flow of air through the chamber, and automatic means for simultaneously controlling the supply of air to and the withdrawal of air from said chamber.

11. In a drier, in combination, a chamber, means for causing a flow of air of predetermined volume through said chamber, and automatic means for simultaneously controlling the supply of air to and the withdrawal of air from the chamber to maintain said volume constant.

12. In a drier, in combination, a chamber comprising a plurality of compartments, means for supplying air to the chamber to cause a flow of predetermined volume through each of said compartments, means for controlling the supply of air to each of said compartments independent of the other, and automatic means for maintaining the said volume of air passing through the other of said compartments constant irrespective of the independent control of the flow through one of the compartments.

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

MARSHALL WHITLATCH.

Witnesses:
R. B. CAVANAGH,
D. E. HARDENBURGH, Jr.