J. T. LE MESSURIER.

DRIER.

APPLICATION FILED MAY 31, 1917.

1,323,484.

Patented Dec. 2, 1919.

3 SHEETS—SHEET 1.

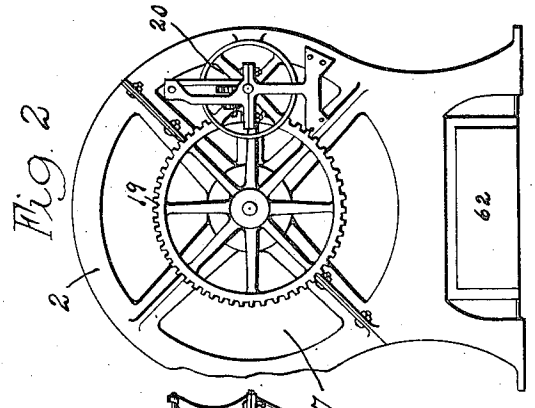

Fig. 2

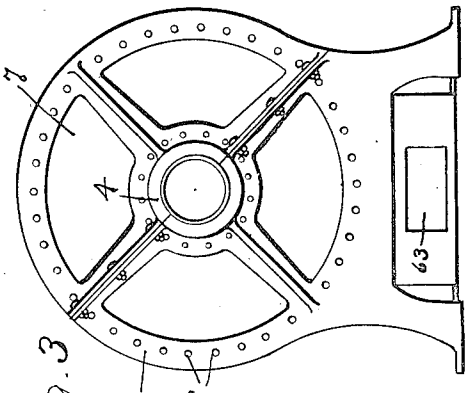

Fig. 3

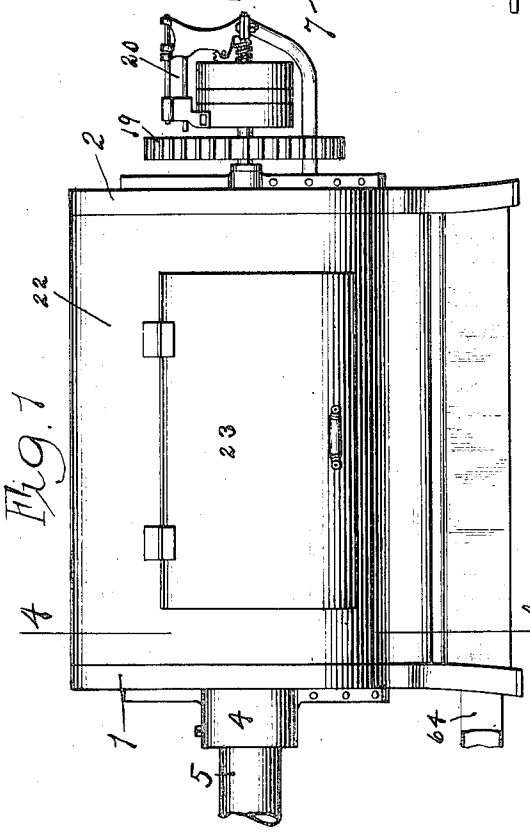

Fig. 1

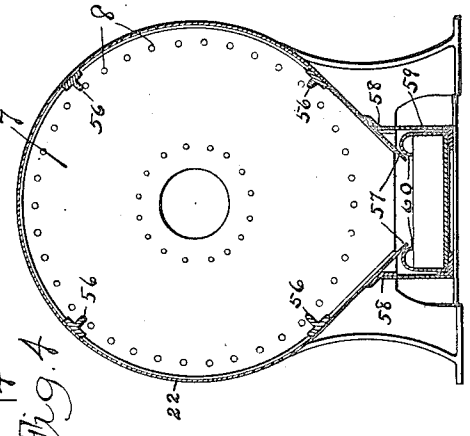

Fig. 4

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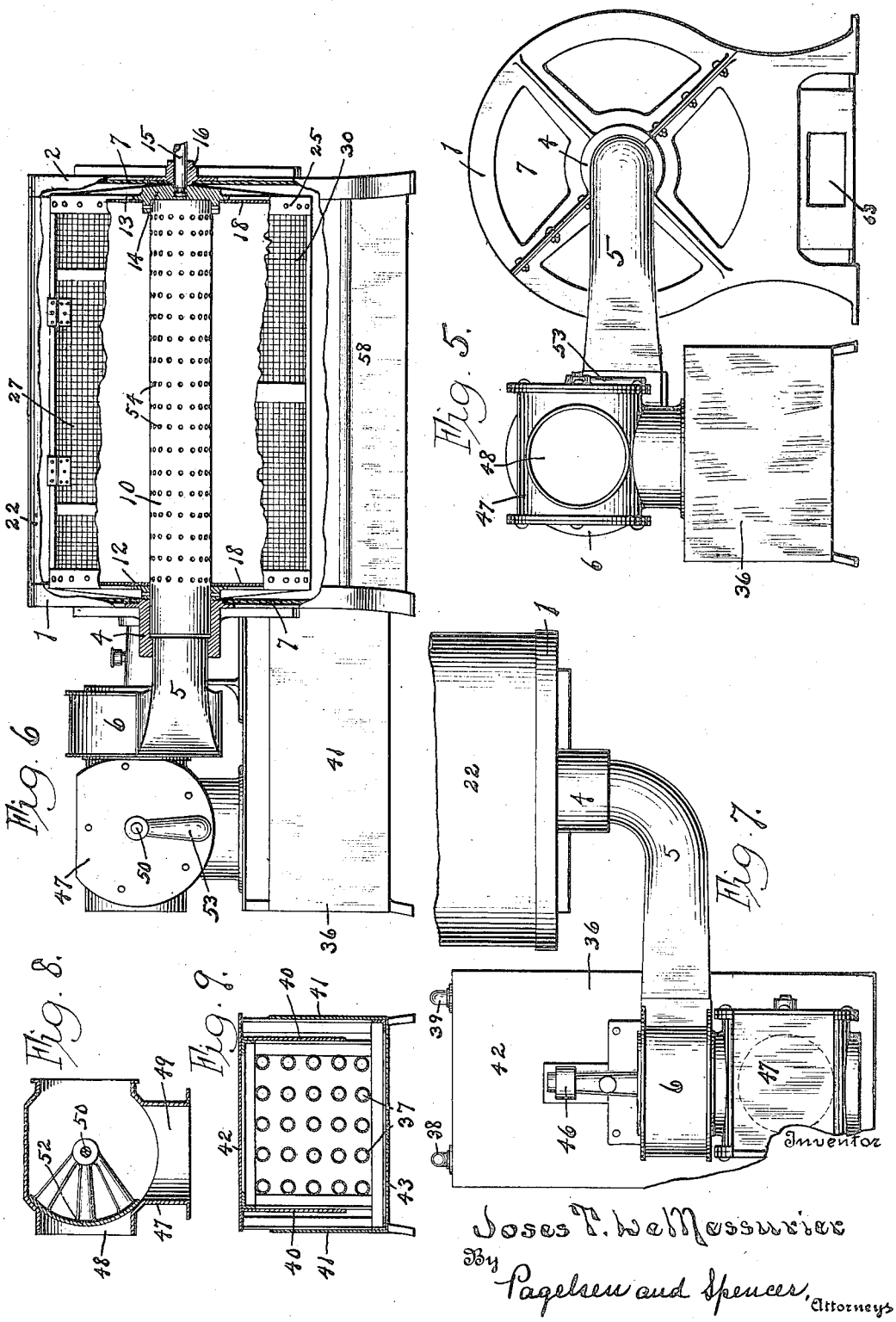
3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 10

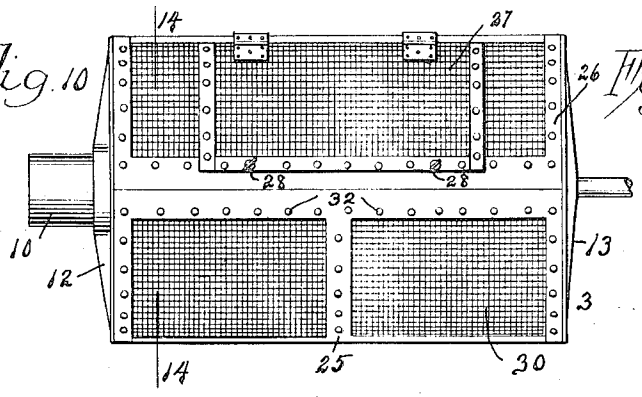


Fig. 11.

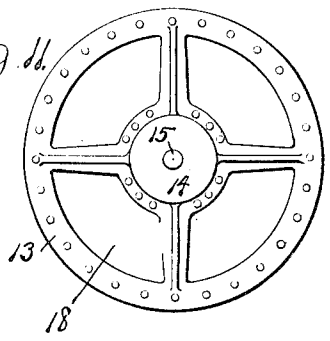


Fig. 13.

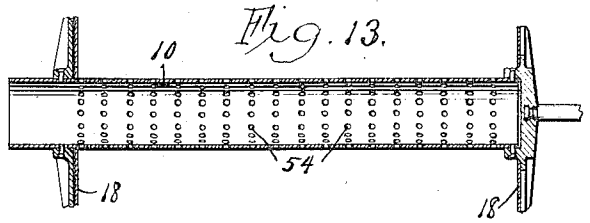


Fig. 12.

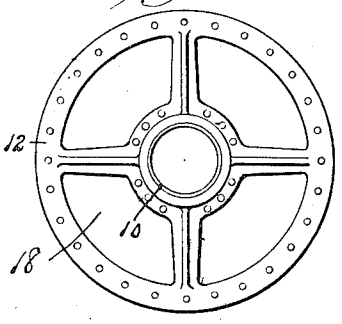


Fig. 14

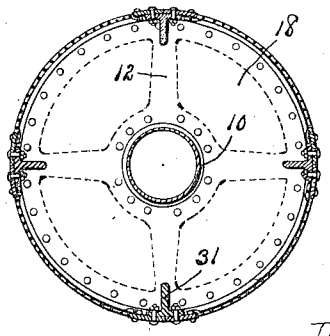


Fig. 15.

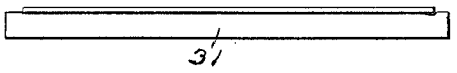
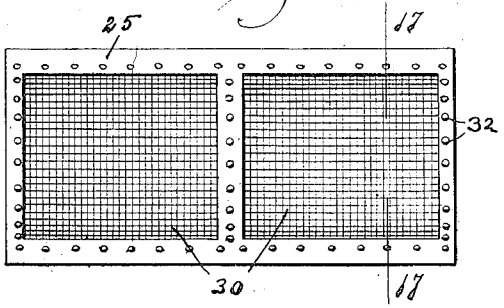


Fig. 16.



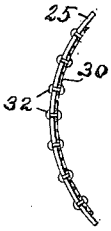


Fig. 17

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UNITED STATES PATENT OFFICE.

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DRIER.

1,323,484. Specification of Letters Patent. Patented Dec. 2, 1919.

Application filed May 31, 1917. Serial No. 117,899.

To all whom it may concern:

Be it known that I, JOSES T. LE MESSURIER, a citizen of the United States, and residing at Detroit, in the county of Wayne and State of Michigan, have invented a new and improved Drier, of which the following is a specification.

This invention relates to means for passing currents of air or other gases, either heated or not as may be desired, through clothing and other fabrics, feathers, fibers and other articles that are to be dried, while at the same time changing the positions of such articles relative to each other so that every portion of each one of them will be exposed to the currents of air; and its object is to provide a rotatable receptacle mounted concentric with a perforated blast-pipe from the holes of which hot or cold air under pressure will pass through the contents of the receptacle.

This invention consists of a horizontal tube and a rotatable cylindrical receptacle mounted on the tube, means for forcing air into such tube and out through the perforations therein into the cylindrical receptacle, means to turn the receptacle alternately in either direction if desired, a housing surrounding the cylindrical receptacle having a discharge pipe, means for heating the air, and means for determining whether hot or cold air is to be forced into the cylindrical receptacle. This invention further consists in the details of construction illustrated in the accompanying drawings and especially set forth in the claims.

In the drawings Figure 1 is a side elevation of the main housing of this improved drying mechanism. Fig. 2 is an end elevation thereof showing the driving mechanism. Fig. 3 is an end elevation of the housing. Fig. 4 is a cross section of the housing on the line 4—4 of Fig. 1. Fig. 5 is an end elevation of this drying machine. Fig. 6 is a side elevation with a portion of the housing and of the cylindrical receptacle broken away. Fig. 7 is a plan of the heating and blowing mechanism. Fig. 8 is a section of the control valve. Fig. 9 is a section of the heating mechanism. Fig. 10 is a side elevation of the cylindrical receptacle. Figs. 11 and 12 are end elevations thereof. Fig. 13 is a central longitudinal section of the perforated tube on which the cylindrical receptacle is mounted. Fig. 14 is a central transverse section of the cylindrical receptacle and tube. Fig. 15 is a side elevation of a T bar employed in building. Fig. 16 is a detail of a portion of the drum. Fig. 17 is a section on the line 17—17 of Fig. 16.

Similar reference characters refer to like parts throughout the several views.

The machine shown in the drawings consists of a source of hot air, a fan or blower for drawing this hot air from the heater and forcing it into the drier, the drier consisting of a revoluble tube having a number of perforations throughout its length, and a cylindrical receptacle, preferably formed of framework on which a wire netting is mounted, which is adapted to receive the articles to be dried. A mechanism is provided for turning this receptacle alternately in opposite directions in order to prevent the material therein from packing down and for the purpose of separating it should it be compacted. A housing is also provided to inclose this receptacle in order to prevent the air which is blown through the articles being dried from escaping into the room in which the machine is located. A discharge pipe is therefore provided which may open out into the air at a distance from the machine.

The housing is shown in Figs. 1, 2 and 3 to consist of end frames 1 and 2 having spiders, that of the frame 1 carrying a bearing hub 4 into which the air pipe 5 from the blower 6 extends. Heads 7 of sheet metal are secured to the inner sides of these spiders by means of rivets 8. These spiders may be formed of two parts, if desired. The bearing hub 4 provides a bearing for the perforated pipe 10 as shown in Fig. 6, on which pipe 10 are mounted the two spiders 12 and 13, the latter being provided with a central hub portion 14 that closes that end of the pipe and carries a shaft 15 which is revoluble in the bearing 16 that is formed at the center of the spider of the end frame 2 of the housing. End plates 18 are secured to the inner sides of these spiders, and are preferably of thin sheet metal.

Secured to this shaft 15 is a driving gear 19 which may be revolved in either direction by means of a reversible driving mechanism 20 of well known construction. This reversible driving mechanism is merely shown conventionally as it forms no part of the present invention.

The shell 22 of the housing is preferably

of sheet metal and extends between the ends 1 and 2 and may be formed with a door 23 which may be opened to load and unload the cylindrical receptacle mounted on the tube 10. This receptacle is formed by the circular ends 12 and 13 and the plates 18, and a series of cylindrical skeleton frames 25 and 26, the latter being formed with a door 27 which may be held closed by means of sliding bolts or the screws 28, shown in Fig. 10. The open spaces of these skeleton frames are filled by panels of heavy woven wire fabric 30 of any desired character. These frames and wire panels may be reinforced by means of the T bars 31, shown in Fig. 14, which extend across between the ends 12 and 13 of this cylindrical receptacle. These panels may be secured to the skeleton frames 25 and 26 by means of rivets 32 as shown in Fig. 17.

Adjacent the drier proper is an air heating chamber 36 which contains a number of coils 37 which connect to a source of steam by means of the fittings 38 and 39 shown in Fig. 7. These pipes are of any desired number and length and the sides of the chamber 36 are preferably each formed of two plates 40 and 41 of sheet metal, the former spaced a short distance from the top 42 of this chamber and the latter a short distance from the bottom 43 so that the air will enter near the top of the case and then pass down between the plates 40 and 41 to the lower tubes 37, and then pass upwardly to the fan or blower 6. This blower may be driven by any type of belt running on the small pulley 46 in the usual manner.

The pipe 5 connects directly to the discharge opening of this blower 6, whose intake opening preferably connects to a valve body 47 having two intake openings 48 and 49, the latter of which connects to the heating chamber 36. A shaft 50 is mounted in this valve casing and carries a valve 52 which may be swung to close the opening 48 or the opening 49 by means of a handle 53.

Hot air is forced into the pipe 10 and from this pipe through the holes 54 therein into the cylindrical receptacle, which is slowly turning back and forth, rolling and unrolling its contents in such a manner that each part thereof will be penetrated by this current of air. The temperature of the air will be controlled by the pressure of the steam in the pipes 37, and the rate of the rotations of the receptacle and the temperature and pressure of the air will depend upon the character of its contents.

The shell 22 of the housing may be supported by the cross bars 56, if found necessary. The lower edges 57 of this shell are connected to the sides 58 of a trough or outlet conduit that extends longitudinally below the housing and contains a shallow box 59 to receive any dust or other removable material from the contents of the drier. The edges 60 of this box may be curled inwardly, as shown in Fig. 4, in order to retain these impurities. The box may have a closed end 62 fitting an opening in the plate 7 at that end of the housing, as shown in Fig. 2.

The plate 7 at the opposite end of the housing may be formed with an opening 63, as shown in Fig. 3, to permit the air to pass out, but preferably, a pipe 64 is connected to this end of the housing and extends out of the room in which the drier is placed. After the goods in the cylindrical receptacle have been thoroughly dried, the valve 52 is swung from the position shown in Fig. 8 to close the passage 49 and open the passage 48. The fan will now force cold air through the drier, reducing the temperature so quickly that the doors 23 and 27 may be opened very much sooner than when the machine and its contents are permitted to cool normally, thus saving much time and conducing greatly to the comfort of the operators, and the rapidity of drying.

While this device is intended primarily for drying clothes by means of blasts of hot air followed by blasts of cold air, it will be understood that any other desired gases, such as dry steam, may be forced through the goods in the cylindrical receptacle, the use of dry steam being particularly desirable in "dry-cleaning" establishments where spontaneous combustion occurs when the hydro-carbon vapors burst into flame because of static electricity created by the friction of the goods being treated.

The details of construction and proportions of the parts may all be changed by skilled mechanics without departing from the spirit of my invention as set forth in the accompanying claims.

I claim:—

1. In a drier, the combination of a housing having closed ends, and a cylindrical shell provided with a longitudinal discharge conduit along its bottom, a receptacle for impurities removably mounted in said conduit, a perforated pipe rotatably mounted in the ends of said housing, a cylindrical receptacle mounted on said pipe, the shell of said receptacle being formed of skeleton frames provided with panels of wire netting, means to rotate said pipe and receptacle alternately in opposite directions, a blower connected to one end of the housing to force air into said pipe and receptacle, means to heat the air, and a valve for connecting said blower to said air heating device or to the outside as may be preferred.

2. In a clothes drying machine, the combination of a housing having closed ends and a cylindrical shell provided with a longitudinal discharge conduit along its bottom, a perforated pipe rotatably mounted in the ends of said housing, a cylindrical receptacle

mounted on said pipe, the shell of said receptacle being formed of foraminous material, means to rotate said pipe and receptacle, a blower to force air into said pipe and receptacle, means to heat the air, and a valve for connecting said blower to said air heating device or to the outside air as may be preferred.

3. In a clothes drying machine, the combination of a housing having closed ends and a cylindrical shell provided with a longitudinal discharge conduit along its bottom, a perforated pipe mounted in the ends of said housing, a cylindrical receptacle mounted on said pipe, the shell of said receptacle being formed of foraminous material, means to rotate said receptacle, a blower to force air into said pipe and receptacle, means to heat the air, and a valve for connecting said blower to said air heating device or to the outside air as may be preferred.

JOSES T. LE MESSURIER.