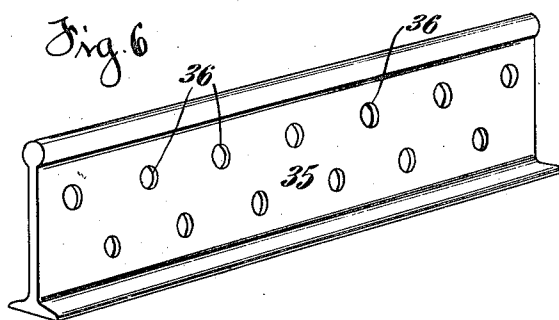
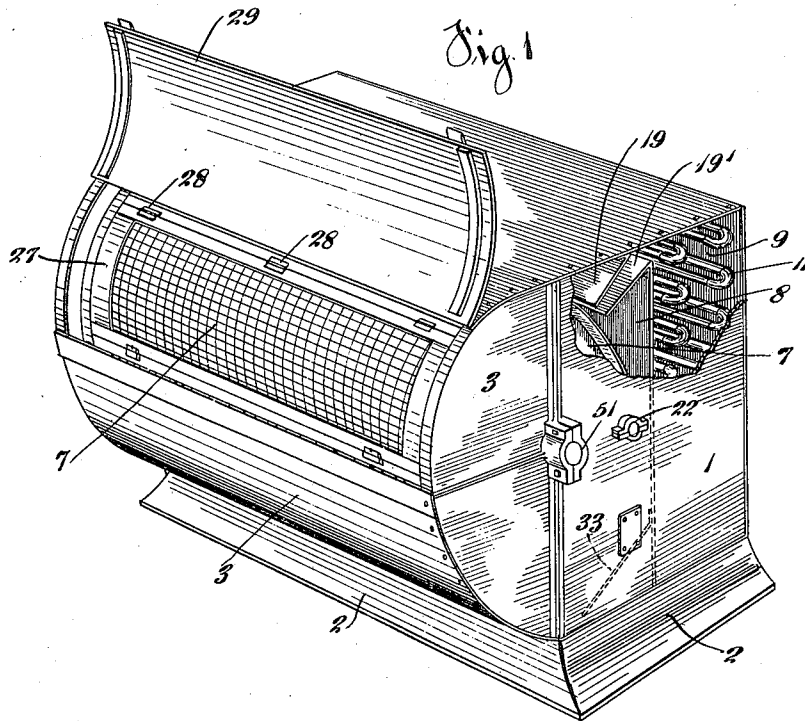


F. M. WATKINS.
 LAUNDRY DRIER.
 APPLICATION FILED DEC. 17, 1910.

1,060,801.

Patented May 6, 1913.

3 SHEETS—SHEET 1.

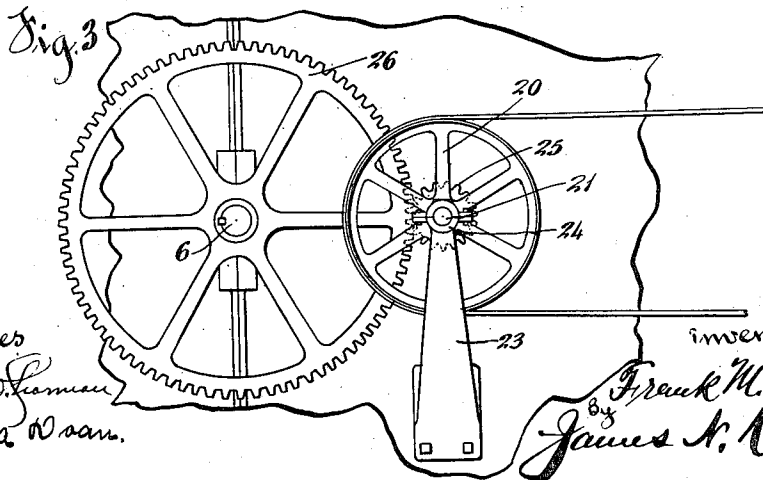
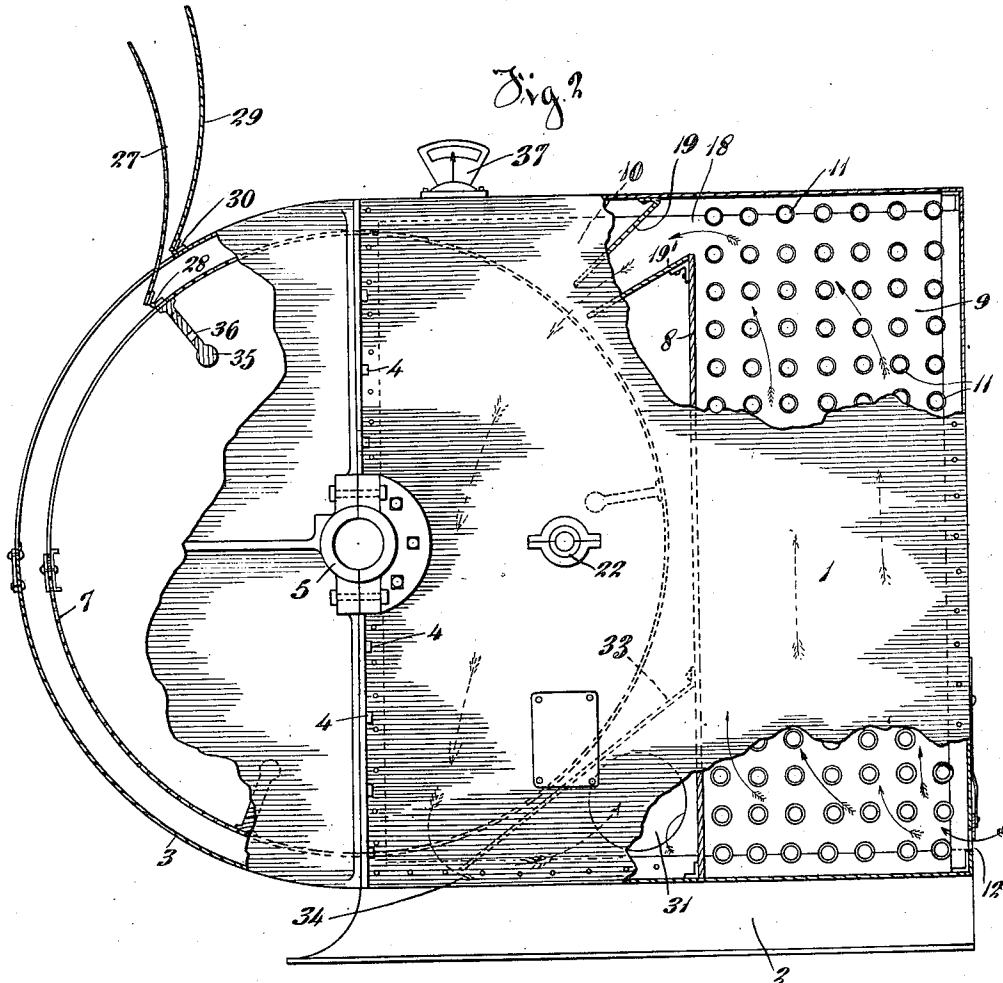


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1,060,801.

3 SHEETS—SHEET 2.



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invention

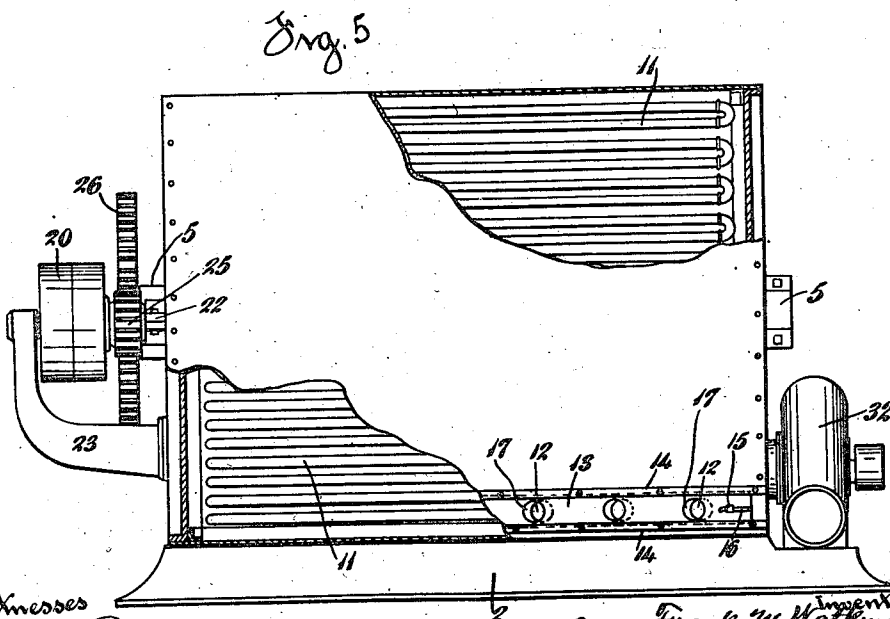
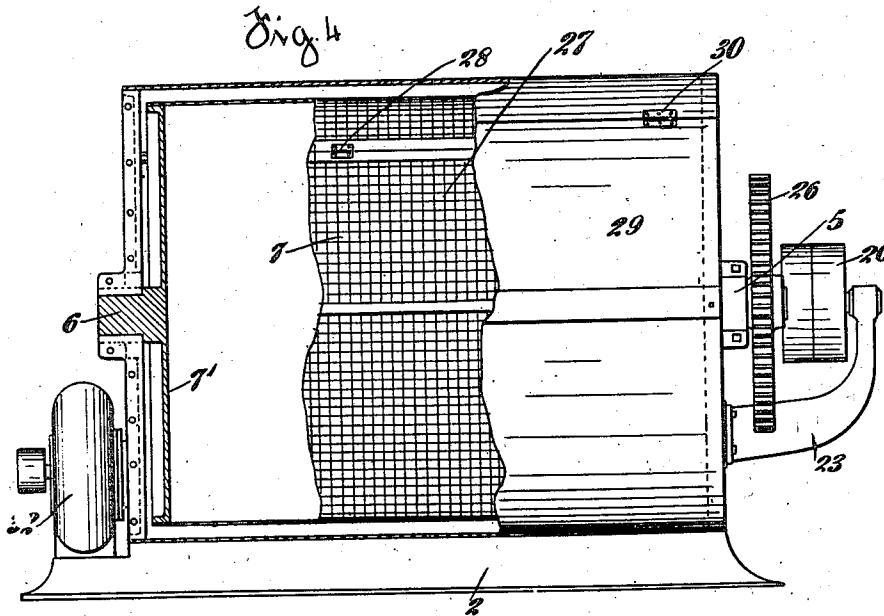
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

FRANK M. WATKINS, OF CINCINNATI, OHIO.

LAUNDRY-DRIER.

1,060,801.

Specification of Letters Patent.

Patented May 6, 1913.

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To all whom it may concern:

Be it known that I, FRANK M. WATKINS, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Laundry-Driers, of which the following is a specification.

My invention relates to vacuum clothes driers, and more particularly to machines for drying clothes after the same have been subjected to moisture in the operation of washing, whereby heated air is drawn through the machine by means of an exhaustor, which creates a partial vacuum therein.

The object of my invention is to produce a clothes drier which is adapted to operate more efficiently, quickly and economically than otherwise, without injury to the clothes, and one which will not scatter the lint in the room, but will withdraw it from the clothes through the machine and discharge it where desired by means of an exhaustor.

It should be understood that when water is extracted from clothes by mechanical means in a centrifugal wringer, a large percentage of water remains in the clothes. In order to extract all of the moisture from the clothes quickly and efficiently, it is necessary to reduce the moisture to vapor, but before water or moisture can become vapor, the upward pressure of the vapor must overcome the downward pressure of the atmosphere. In other words, vaporization of water is conditioned by the atmospheric pressure and when a point is reached at which the heat overcomes the cohesion and the pressure of the atmosphere, then the water passes into vapor and escapes in gaseous form when it rises into space and spreads through it according to the laws of diffusion of gases. By placing the wet or moist clothing within a partial vacuum, where the pressure of the air upon the moist clothing is greatly reduced, the vaporization will take place more quickly and by tumbling the clothes in such vacuum, and withdrawing the vapor with an exhaustor the same will be dried in a shorter space of time and with less heat than it is possible to do in any other way. It should also be understood that a greater amount of heat is required to evaporate water under normal atmospheric pressure than within a partial vacuum where part of such atmospheric pressure is removed.

My invention consists in a heating chamber, a drying chamber connected thereto and means whereby a partial vacuum is maintained in said chambers.

My invention also consists in the parts and in the peculiar construction, combination and arrangement of parts as herein set forth and claimed.

In the accompanying drawings which serve to illustrate the construction and use of my invention: Figure 1 is a perspective view of my device. Fig. 2 is an end elevation, parts being broken away to show the inner chambers and rotating cylinder. Fig. 3 is a detail view of the driving mechanism. Fig. 4 is a front elevation, parts being broken away. Fig. 5 is a rear view of my improved drier. Fig. 6 is a detail perspective view of one of the perforated ribs in the rotating cylinder.

In the embodiment of my invention as illustrated and which shows a preferred construction, 1 represents the outer casing of my device supported upon a suitable base 2, and 3 the front housing which is adapted to be bolted to said casing by means of bolts 4. A perforated rotating cylinder 7 is provided with journals 6 which are adapted to be mounted in bearings 5 at the ends of the casing 1 and front housing 3.

The compartment formed by the casing 1 and the front housing 3 is divided into a heating chamber 9 and a drying chamber 10 by means of a vertical partition 8. The heating chamber 9 is provided with heating pipes 11 which are preferably adapted to be heated by steam. Intake openings 12 are provided in the rear of the device and form an intake for air to be heated and are adjustable by means of a sliding shutter 13, slidable in tracks or guide plates 14. The sliding shutter 13 is adapted to be held in any position desired by means of a set screw 15 passing through a slot 16 in said shutter. The shutter 13 is provided with openings 17 adapted to register with air intake openings 12 in the casing 1, so that the amount of air to be heated can be regulated.

By adjusting the shutters over the intake openings 12 so as not to allow as much air to pass therethrough, it is quite evident that I am enabled to produce a more perfect vacuum in the chambers 9 and 10, due to the exhaustor exhausting the air therefrom and discharging it from its outlet.

The heating chamber 9 is preferably ar-

3 ranged at one side of the drying chamber 10 containing the rotating cylinder 7, and extends from the base 2 to the top of the machine. A partition 8 extends upwardly from the base between said heating chamber 9 and said drying chamber 10 to a point close to the top of the machine, thereby separating said chambers and forming an air passage from the heating chamber 9 to the drying chamber 10. This passage, which is indicated at 18, is preferably located at the top of the heating chamber, because that is the point where the temperature is the highest in the heating chamber, and the heat at its highest temperature is discharged immediately and without deterioration into the rotating cylinder for use in drying the clothes.

10 It is the purpose of the machine to draw the heated air from the heating chamber through the rotating cylinder in order to dry the clothes placed therein, and in order to draw the air as close to the center of the rotating cylinder as possible, I provide deflector plates 19 and 19' adjacent the passage 18 and extending into the drying chamber 10, to near the periphery of the rotating cylinder 7, the plate 19 being fastened to the top of the casing, and the plate 19' to the top of the partition 8. Thus the deflector plates 19 and 19' as illustrated are adapted to direct the highly heated air directly to the center of the rotating cylinder 7, distributing it thoroughly throughout the entire length of cylinder and drying chamber, where it is applied to use in drying the clothes.

20 The rotating cylinder 7 is rotated by means of driving pulley 20, mounted upon shaft 21 on the outside of the machine, the shaft 21 being supported by means of a bearing 22 mounted outside of the machine, and an arm 23 carrying bearing 24 for the other end of the shaft 21. A pinion gear 25 is mounted on the shaft 21 and is adapted to engage and mesh with the gear wheel 26, mounted on one of the journals or trunnions 6 of the rotating cylinder 7. The cylinder 7 is preferably made of wire screen of a coarse mesh in order to allow free passage of the air therethrough, and it has end plates 7' adapted to close the ends of the cylinder and support the journals or trunnions 6 for said cylinder. Said cylinder 7 is also provided with a wire mesh door 27 hinged in a suitable manner at 28 thus providing suitable access to the cylinder 7 for depositing or removing the clothes to be dried therein. The front housing 3 is also provided with a door 29 hinged at 30, and is adapted to be closed in order that it may make the chamber 10 as air tight as possible and allow no air to pass therethrough when the machine is in operation. The partial vacuum within the machine also tends to hold said door 8 closed.

In order to prevent the clothing from sliding upon the inner surface of the rotating wire screen cylinder 7, and unnecessarily wearing the clothing and shearing off the buttons, I provide longitudinally extending ribs 35 which have openings 36 therein, said ribs being fastened to the wire screen cylinder at suitable distances apart. By thus placing the ribs in the rotating cylinder 7, the clothes are carried upwardly by each rib and drop or fall therefrom immediately in front of the succeeding rib, which carries them up again to the same point, when they drop as before, and so on, thus avoiding the sliding and shearing action which would otherwise occur. These ribs which are disposed longitudinally on the inner surface of the cylinder also insure the thorough and constant tumbling and shifting of position of the clothing within the cylinder, thereby permitting of more thorough and complete circulation of the heated air therethrough for the purpose of drying the clothing. The perforations cause the clothes to adhere to the ribs and thereby carry the same higher in the cylinder before they drop or are tumbled thereby preventing slipping of the clothes on the wire screen. I prefer to provide a double row of said openings 36 arranged in staggered form. The free edges of said ribs are preferably enlarged as shown to more readily hold the clothes and the openings 36 also cause the clothing to more readily adhere to the rib and not slide off while being carried upwardly until the same reaches the desired point.

The drying chamber 10 is provided with an outlet 31 to which is attached an exhaustor 25 of any suitable type, by which the air and lint from the clothes are withdrawn from the drying chamber, thereby exhausting or drawing the air from the heating chamber 9.

In order to cause the air to thoroughly pass through the cylinder 7 and not around one side thereof, I provide a baffle plate 33 at the bottom of the heating chamber 10, having its upper edge fastened to the partition 8 and slanting downwardly so that its other edge extends close to the floor of chamber 10 and forms a passage 34 between it and the floor the entire length of said chamber, thus preventing the air from having a direct passage from the inlet 18 between the baffle plates 19 and 19' down to the outlet 31.

On laundry drying machines of the blowing type when the outer door 29 is opened while the machine is in operation, a blast of hot air immediately rushes therefrom carrying lint from the clothing with it, and thus covering the floor of the room and the operator with lint. In my device, due to the vacuum principle involved, this objection-

able feature is overcome and instead there is a sudden inrush of air from the room into the machine when the door 29 is opened. The exhauster has a tendency to create a strong suction within the cylinder and thereby draws the lint from the clothes through opening 31 and discharges the same upon the outside of the machine.

A pressure gage 37 is preferably provided at the top of the machine and connects with the drying chamber 10 to indicate the atmospheric pressure inside of the chamber 10. Thus it is seen that an operator by watching the indicating gage 37 and at the same time regulating the shutter 13 over the intake openings 12, the vacuum inside of the chamber 19 may be increased or diminished as desired.

When it is desired to operate the machine, heat the pipes 11 by steam or otherwise, adjust the air intake openings to admit the proper amount of air to be heated, insert the clothes in cylinder 7 through the doors 29 and 27, then close the doors and start the operating mechanism of the machine by which the cylinder is rotated either in one direction or alternately in the reverse direction, and by which the exhauster is also operated, continuing such operation until the clothing is dried, when the operating mechanism is stopped and the clothing removed. The partial vacuum in said heating chamber and said drying chamber is readily varied by the speed at which the exhauster is driven, the size of said exhaust and by means of regulating the intake openings situated in the chamber in which the steam pipes are located.

Modifications of my invention may be made without departing from its spirit or scope and I do not therefore wish to be confined to the details shown or to the particular construction and arrangement of the parts, or means of operating same, but

What I claim as new and desire to secure by Letters Patent is—

1. A laundry drier comprising a drying chamber, a perforated cylinder adapted to rotate therein, an air heating chamber adjacent said drying chamber, a passage from said air heating chamber to said drying chamber and cylinder, deflector plates extending toward the center of said cylinder, an air outlet for said drying chamber, an exhauster for said air outlet and a baffle plate extending across the lower part of said drying chamber whereby the air is adapted to be exhausted from said cylinder through a passage between said baffle plate and the wall of said drying chamber, substantially as set forth.

2. A laundry drier comprising a drying chamber, a perforated cylinder adapted to

rotate in said drying chamber, a heating chamber having means for admitting air thereto, a passage from said heating chamber to said cylinder, a baffle plate forming an elongated passage between its lower edge and the bottom of said drying chamber to direct the course of the air through said cylinder, and an air outlet and exhauster therefor, substantially as set forth.

3. A laundry drier comprising a drying chamber, a perforated cylinder adapted to rotate in said drying chamber, parallel perforated ribs extending longitudinally in said cylinder, a heating chamber, an air passage from said heating chamber to said cylinder, an air outlet from said heating chamber and cylinder and an exhauster for said air outlet, substantially as set forth and for the purposes specified.

4. A laundry drier comprising a drying chamber, a perforated cylinder adapted to rotate in said drying chamber, a vertical heating chamber arranged adjacent said drying chamber, means for admitting air to said heating chamber, a passage from said heating chamber at its top to said cylinder, a baffle plate extending from the wall of said drying chamber downwardly toward the bottom thereof whereby an elongated passage is formed between the lower edge of said plate and the bottom of said drying chamber to direct the course of the air through said cylinder and an air outlet and exhauster therefor, substantially as set forth.

5. A laundry drier comprising a drying chamber, a perforated clothes drying cylinder therein, a series of perforated ribs adapted to carry the clothes upwardly in said cylinder and to drop them directly in front of the next rib to prevent any sliding or shearing of the clothes on the surface of the cylinder, a heating chamber adjacent said cylinder, a passage from said heating chamber to said cylinder, an air outlet from said cylinder, and an exhauster for said air outlet whereby a partial vacuum is formed within said heating chamber and said cylinder, substantially as set forth and for the purposes specified.

6. An exhaust drier embracing a movable receptacle for turning clothes, an exhaust chamber inclosing the same, an exhaust pipe and pump communicating with said exhaust chamber, heating coils adapted to heat the chamber, said exhaust chamber having an opening therein whereby the hot air from the coils is drawn through said receptacle and chamber by the exhaust pump.

FRANK M. WATKINS.

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