F. WEGNER & H. SCHRADER.

DRIER.

APPLICATION FILED JAN. 30, 1915.

1,247,045.

Patented Nov. 20, 1917.

3 SHEETS—SHEET 1.

Fig. 1.

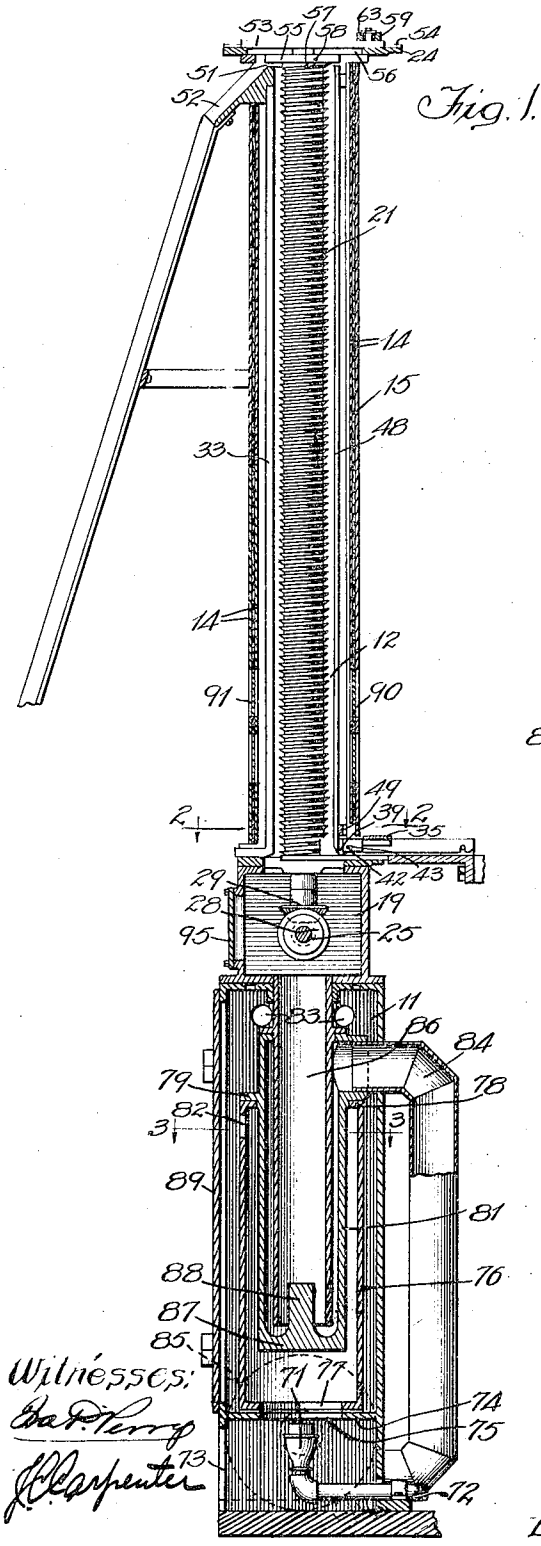
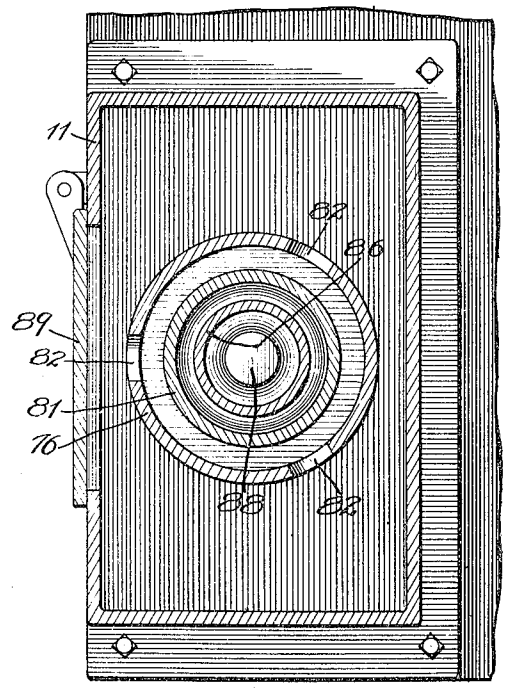


Fig. 3.



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3 SHEETS—SHEET 2.

Fig. 2.

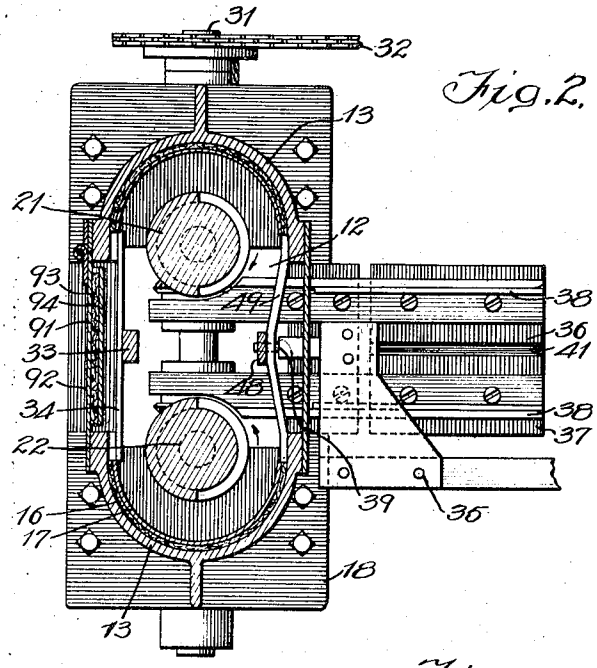


Fig. 4.

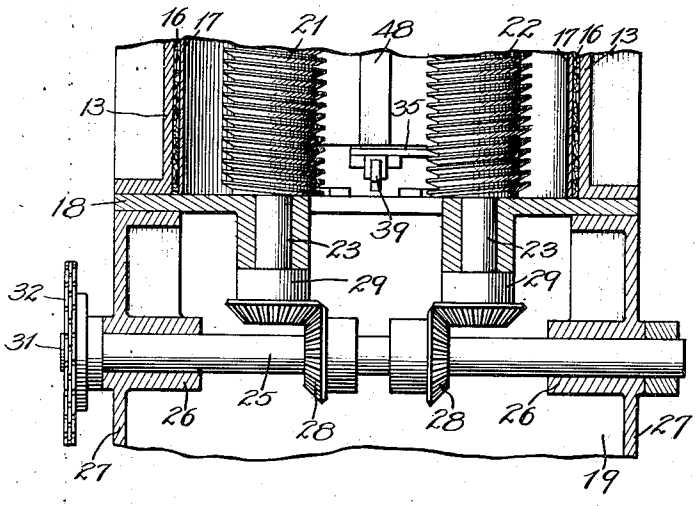
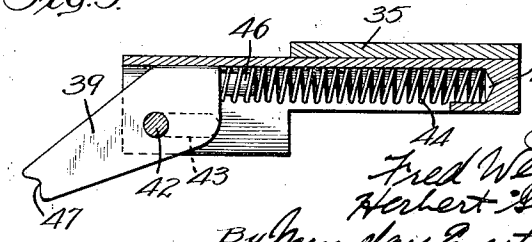


Fig. 5.



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3 SHEETS—SHEET 3.

Fig. 6.

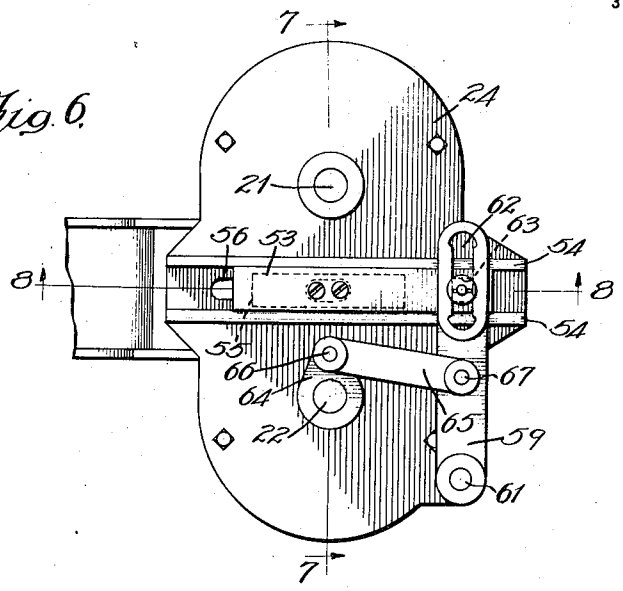


Fig. 7.

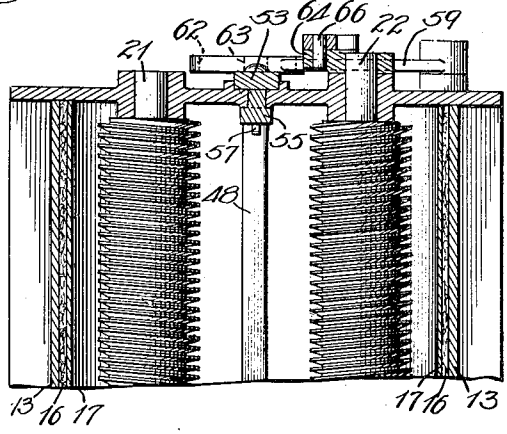
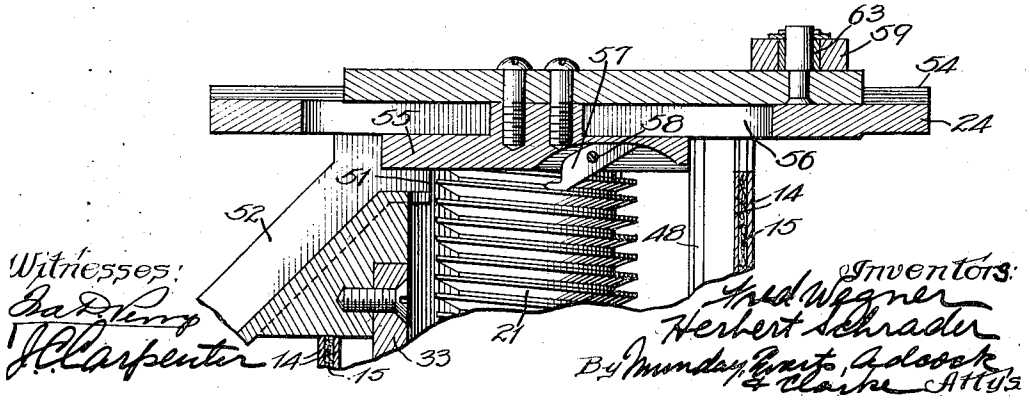


Fig. 8.



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UNITED STATES PATENT OFFICE.

FRED WEGNER, OF FAIRPORT, NEW YORK, AND HERBERT SCHRADER, OF INDIANAPOLIS, INDIANA, ASSIGNORS TO AMERICAN CAN COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

DRIER.

1,247,045. Specification of Letters Patent. Patented Nov. 20, 1917.

Application filed January 30, 1915. Serial No. 5,204.

To all whom it may concern:

Be it known that we, FRED WEGNER, a citizen of the United States, residing in Fairport, in the county of Monroe and State of New York, and HERBERT SCHRADER, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Improvement in Driers, of which the following is a specification.

Our invention relates in general to driers and more particularly to driers provided for the drying of can ends and other disk-like objects which have been coated with lacquer or the like or which have been provided with a sealing medium in liquid or semi-liquid form which it is desired to dry wholly or in part, although it will be readily understood that devices embodying our invention may be constructed for other uses.

It is a principal object of this invention to provide a drier for articles of the kind described which will be wholly automatic in the performance of its functions and which may be operated continuously at small cost, the articles being fed either by hand or by suitable machinery, which machinery may perform other duties, such, for instance, as providing the flanges of the can ends with a sealing material or which may be connected directly with apparatus performing this or other operation.

A further object of the invention is to provide a device of this character in which heated air may be economically provided to dry the articles being operated upon, the parts of the device being so constructed and arranged that the air may be passed through the device at relatively high velocity and may be preheated before coming in actual contact with the articles being treated.

A still further object of the invention is to provide a device of the character described consisting of few simple and durable parts.

Other objects and advantages of the invention will be apparent as it is better understood from the following description when considered in connection with the accompanying drawing illustrating a preferred embodiment thereof.

Referring to the drawings, Figure 1 is a vertical, sectional view taken centrally from front to back through a drier embodying our invention.

Fig. 2 is a transverse, sectional view taken substantially on the line 2—2 of Fig. 1.

Fig. 3 is a similar view taken substantially on the line 3—3 of Fig. 1.

Fig. 4 is an enlarged, detail, sectional view showing the driving mechanism employed in the present instance.

Fig. 5 is an enlarged, detail view of the feeding-in dog and its mounting.

Fig. 6 is a partial top plan view showing the mechanism provided to operate the ejector.

Fig. 7 is a partial, sectional view taken substantially on the line 7—7 of Fig. 6; and

Fig. 8 is a similar view taken on the line 8—8 of Fig. 6.

The embodiment of the invention now about to be described and illustrated on the drawings comprises a base 11 in which are mounted, as will be later disclosed, means for preheating the air to be delivered to the compartment in which the articles being treated are dried. This compartment, generally indicated at 12, has a feeding in station at the bottom and a delivery station at the top and consists in the present instance, of two elongated substantially semi-circular side walls 13, connected throughout their lengths at the front and back by plates 14 between which is provided a suitable packing 15 of asbestos or other heat insulating material. The plates 14 and end walls 13 give to the compartment the substantially oval, elongated shape shown in Figs. 1 and 2. Within the semi-cylindrical side walls 13 asbestos or other packing 16 is provided and this packing is held in place by an internal plate 17 secured in each side wall 13. The side walls 13 and the rear plates 14 are secured at their lower ends upon a base plate 18 resting upon or forming a part of a compartment 19 in which the driving mechanism is provided. Within the compartment 12 and extending longitudinally thereof, are two screw conveyers 21, 22, oppositely and deeply threaded, said conveyers being mounted apart an appropriate distance to permit the edges or other suitable projections of the articles being treated to engage in the threads of these

conveyers. The conveyers are threaded to like pitch and oppositely, one being left hand and the other right. The conveyers 21 and 22 are journaled at 23 in suitable bearings in the plate 18 at their lower end and in a head plate 24 (Fig. 6) at their upper end. They are driven from a shaft 25 extending through the compartment 19 and journaled near its ends at 26 in the side walls 27 of this compartment. Bevel gears or pinions 28 on this shaft are in continuous mesh with bevel gears 29 on the lower ends of the conveyers and a sprocket wheel 31 is secured upon the end of this shaft without the compartment 19 and is driven by a sprocket chain 32 from any suitable source of power. Viewing Fig. 4, it will be noted that the bevel gears 28 are of like diameter and that the bevel gears 29 are also of like diameter, arranged, however, to be oppositely driven by the bevel gears 29. The conveyers, therefore, if the shaft be rotated in the proper direction, turn toward each other at equal speed. It is intended, in the present instance, that these conveyers turn as indicated by the arrows in Fig. 2. A guide 33 extends vertically upwardly in parallelism with the conveyers in position to be engaged by the edge of articles fed to the conveyers to hold these articles in place and permit the turning of the two conveyers to raise the articles from the lower to the higher end of their effective travel. The guide 33, in the present instance, is supported on cross braces 34 suitably arranged and secured at their ends to the rigid semi-cylindrical side walls 13.

These articles are fed into the conveyer in any suitable fashion, in the present instance, a slide 35, reciprocating continuously from an appropriate source of power and timed to move synchronously with the sprocket wheel 31, being provided. This slide extends over a channel 36 formed in a table or support 37 between guides 38 in which the can ends or other articles being operated upon may fit. The slide is guided in its movement by engagement with one of the guides 38 and by the engagement of a dog 39 pivoted on the slide and taking into a slot 41 in the table 37. This dog is pivoted by a pin 42 in a slot 43 in the under side of the slide, a spring 44 being provided to restrain the movement of the dog 39 and to hold it in its normal position, as shown in Fig. 5. This spring is positioned in a recess 45 of the slide at one end and embraces a lug 46 on the dog at the other. When the slide moves to the left, viewing Fig. 2, the dog 39 rides up on a can end or other article in the channel 36 and drops behind it, and moving in the opposite direction engages the can end in a notch 47 in the end of the dog. Further movement carries the can head between the lower ends of the conveyers 21 and 22 in position to be raised through the rotation of these conveyers.

A forward guide 48 extends upwardly in the compartment 12 opposite the guide 33 and this guide is mounted on brackets 49 engaging against the sides of the semi-cylindrical side walls 13. This guide is provided to retain the can ends or other articles in position between the conveyers should the machine be stopped and turned slightly backwardly. When the cans reach the top of the conveyers they are ejected through an opening 51 in the rear wall into a chute 52 down which they slide into suitable receiving devices or mechanisms. This ejectment is effected by a reciprocating slide 53 moving in a channel between guides 54 and having a dog carrying member 55 disposed through a slot 56 in the top plate 24. The dog carrying member is provided with a dog 57 pivotally mounted in the dog carrying member at 58, movement of the slide and dog toward the left, viewing Fig. 8, serving to slide the article through the opening 51 into the chute, return movement bringing the dog back into position to engage behind the next succeeding article. Should this dog be a little late in its return movement it may trail ride over the top of the upwardly moving can end and drop into position behind it. The slide 53 receives a continuous reciprocation, giving to the dog an intermittent effective movement through a lever 59 pivoted at 61 on the top plate 24 and having an elongated slot 62 at its free end through which is positioned a block 63 fastened upon the slide 53. The lever 59 is oscillated about its pivot 61 by a crank arm 64 secured upon the end of one of the conveyers 21 or 22, which crank arm is connected with the lever 59 by a link 65 connected at one end at 66 with the crank arm and at the other at 67 intermediate the ends of the lever 59. These parts are so arranged that the desired travel is given the dog 57, this dog being arranged to move once for each movement of the feeding-in dog 39 at the bottom of the conveyer.

As the articles are carried up by the conveyers they are subjected to a continuously moving bath of heated air, this air being preferably at a velocity greater than that of the articles themselves. In the bottom of the supporting base 11 a burner 71 is positioned and connected with a suitable gas or other fuel feed 72, a suitable aperture 73 being provided to permit the entrance of air for the combustion of the fuel. A partition 74 extends across the support 11 just above the burner and is provided with a central aperture 75 above the burner to accommodate the flame. A sheet metal, preferably cylindrical member 76 forming a combustion chamber rests upon this partition

and has an aperture 77 registering with the aperture 75 in the partition. The upper edges of the member 76 are turned inwardly to form flanges 78 upon which rest flanges 79 of an air heating chamber. This chamber is formed by a cylindrical wall 81 extending downwardly in the combustion chamber to just above its bottom. Apertures 82 are formed in the side walls of the cylindrical member 76 to permit the escape of the products of combustion into the body of the support which forms a flue communicating with apertures 83 which may be connected with any suitable conduit adapted to dispose of the burnt gases. Air is admitted to the air chamber through a pipe 84, being forced therein by a blower 85. Communication is established between the air heating chamber and the compartment by a pipe 86 extending downwardly from the chamber 19 in which the shaft 25 is positioned. This pipe extends downwardly to near the bottom of the air chamber so that air entering must pass downwardly between it and the walls 81, and thence upwardly throughout the length of the pipe across or through the chamber 19 and into the compartment 12. The bottom of the air chamber is made thick, as seen at 87 and a tongue 88 integral with this bottom extends upwardly within the pipe 86 forming a radiator for further heating the air in its passage through the preheater. After the air reaches the top of the compartment 12 it passes out through the opening 51 to the outside air.

Suitable doors are provided in the support and in the front and back plates 14 of the compartment, as seen at 89, 90 and 91, the doors in the compartment being formed of a metallic sheet 92, packing 93 and an inner sheet 94. A removable plate 95 is provided on a side of the chamber 19 to permit access to the pinions 28 and 29.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be obvious that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing any of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

We claim:—

1. A drier comprising, in combination, a compartment having a feeding-in station at one end and a delivery station at the other, a pair of screw conveyers extending in and lengthwise of said compartment and adapted to convey articles being dried through the compartment, means for rotating said screw conveyers at like velocity and each in direction to move articles from said feeding-in station to said delivery station, and devices operated by one of said conveyers for moving said articles transversely to said conveyers.

2. A drier comprising, in combination, a compartment having a feeding-in station at one end and a delivery station at the other, a pair of screw conveyers extending in and lengthwise of said compartment and adapted to convey articles being dried through the compartment, means for rotating said screw conveyers at like velocity and each in direction to move articles from said feeding-in station to said delivery station, guides positioned adjacent said conveyers for maintaining the articles carried thereby in substantially central position, and transversely operating slides for moving said articles into and out of engagement with the screws of said conveyers.

3. A drier comprising, in combination, a compartment having a feeding-in station adjacent one end and a delivery station adjacent the other, a pair of screw conveyers, one of said conveyers being provided with left hand and the other with right hand threads and both extending in and lengthwise of said compartment, means for rotating said conveyers at like velocity and in opposite directions, and a heat-insulating lining for said compartment extending along the course of said conveyers.

4. A drier comprising, in combination, a vertically disposed elongated compartment, air heating means beneath said compartment and communicating with its bottom, a vertical conveyer disposed within and lengthwise of said compartment, means for feeding articles to be dried horizontally to said conveyer at one end, and means for ejecting said articles horizontally at the other, said feeding and ejecting means being operated in time with the movement of the conveyer.

5. A drier comprising, in combination, a vertically arranged elongated compartment, heating means beneath said compartment and communicating through the bottom thereof, a conveyer mounted within and movable lengthwise of said compartment, means for feeding articles horizontally to said conveyer, means for ejecting articles horizontally from said conveyer, said means being located adjacent the ends of effective travel of said conveyer, and mechanism for actuating said feeding and ejecting means in time with the movement of the conveyer.

6. A drier comprising, in combination, a vertically arranged elongated compartment having drying means, a conveyer movable in and lengthwise thereof, and ejecting means for removing articles carried by said conveyer from said compartment, said means being operable by said conveyer.

7. A drier comprising, in combination, a compartment having drying means, a continuously moving conveyer mounted within

and lengthwise of said compartment, and intermittently operable ejecting means for removing articles carried by said conveyer from said compartment, said means being operable by said conveyer.

8. A drier comprising, in combination, a compartment having drying means, a continuously rotatable conveyer, and ejecting means reciprocating across the path of travel of articles carried by said conveyer and adapted to remove articles from said compartment, said means being operable by said conveyer.

9. A drier comprising, in combination, a compartment having drying means, a continuously rotating conveyer mounted within and lengthwise of said compartment, and a feeding device intermittently operable for feeding articles to said conveyer.

10. A drier comprising, in combination, a compartment having drying means, a continuously rotating conveyer mounted within and lengthwise of said compartment, and a reciprocating feeding device for feeding articles to said conveyer.

11. A drier comprising, in combination, a compartment, means for conveying articles through said compartment, and means for passing a heated air current continuously through said compartment, said means comprising a burner, a combustion chamber above said burner and a preheating circuitous passageway communicating with the outside air and with the interior of said compartment.

12. A drier comprising, in combination, a compartment, means for conveying articles to be dried through said compartment, means for passing a current of heated air continuously through said compartment, said means comprising a burner, a combustion chamber above said burner, a flue about said combustion chamber and communicating with said combustion chamber, an air chamber arranged within said combustion chamber, and means for directing air through said air chamber through a circuitous path.

13. A drier comprising, in combination, a compartment, means for conveying articles to be dried through said compartment and means for passing heated air continuously through said compartment, said means comprising a burner, a combustion chamber, an air chamber within said combustion chamber, said air chamber communicating with the outside air and with said compartment and a radiator disposed in said air chamber.

14. A drier comprising, in combination, a compartment, means for conveying articles to be dried through said compartment and means for passing heated air continuously through said compartment, said means comprising a burner, an air chamber above said burner, an air flue disposed through said chamber and having one end in communication with said compartment and the other end disposed adjacent said burner and near the bottom of said air chamber, and an air feeding pipe communicating with the top of said chamber whereby air is directed to the top of said chamber and caused to pass down between the walls of said chamber and outside said air flue and thence through said air flue of said compartment.

15. A drier comprising, in combination, a compartment, means for conveying articles to be dried through said compartment, means for passing heated air continuously through said compartment, said means comprising a burner, an air chamber above said burner, an air flue disposed through said chamber and having one end in communication with said compartment and the other end disposed adjacent said burner and near the bottom of said air chamber and an air feeding pipe communicating with the top of said chamber whereby air is delivered to the top of said chamber and caused to pass down between the walls of said chamber and outside said air flue and thence through said air flue of said compartment, and a fan for increasing the velocity of said air.

Signed in the presence of two subscribing witnesses.

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