Dec. 26, 1933. K. F. SNOW ET AL 1,940,978

APPARATUS FOR DRYING BARRELS AND LIKE ARTICLES

Filed July 21, 1930 4 Sheets-Sheet 1

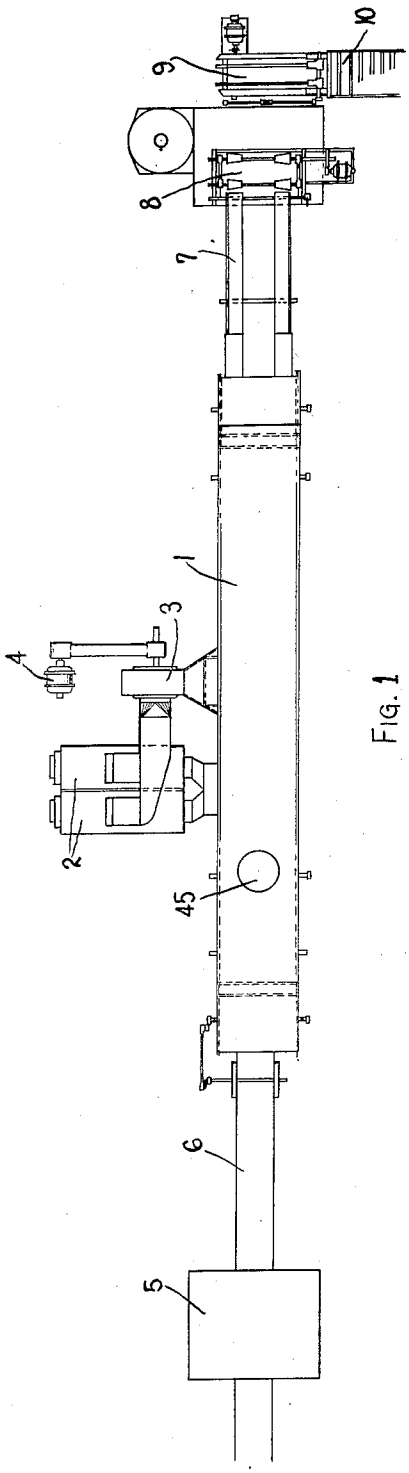


FIG. 1

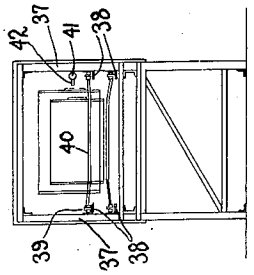


FIG. 6

INVENTORS
Karl F. Snow and
Benjamin A. Smith

BY
Day, Oberlin & Day
ATTORNEYS

Dec. 26, 1933. K. F. SNOW ET AL 1,940,978

APPARATUS FOR DRYING BARRELS AND LIKE ARTICLES

Filed July 21, 1930 4 Sheets-Sheet 2

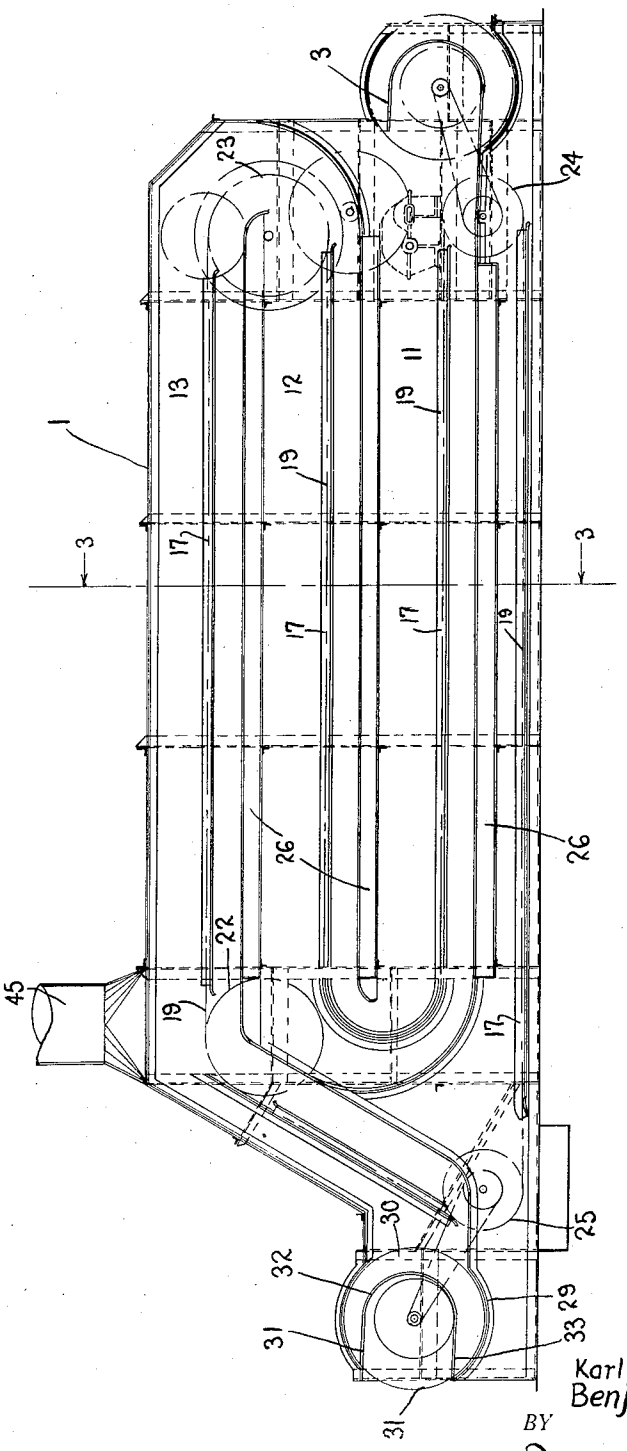


FIG. 2

INVENTORS
Karl F. Snow
and
Benjamin A Smith

BY
Fay, Oberlin & Fay
ATTORNEYS

Dec. 26, 1933. K. F. SNOW ET AL 1,940,978

APPARATUS FOR DRYING BARRELS AND LIKE ARTICLES

Filed July 21, 1930 4 Sheets-Sheet 3

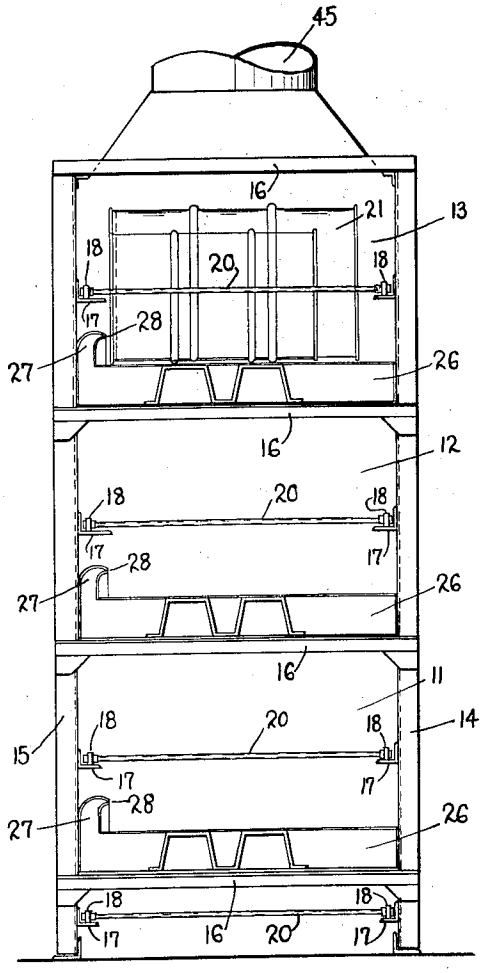


FIG. 3

INVENTORS
Karl F. Snow
and
Benjamin A. Smith
BY
Fay, Oberlin & Fay
ATTORNEYS

Dec. 26, 1933. K. F. SNOW ET AL 1,940,978

APPARATUS FOR DRYING BARRELS AND LIKE ARTICLES

Filed July 21, 1930 4 Sheets-Sheet 4

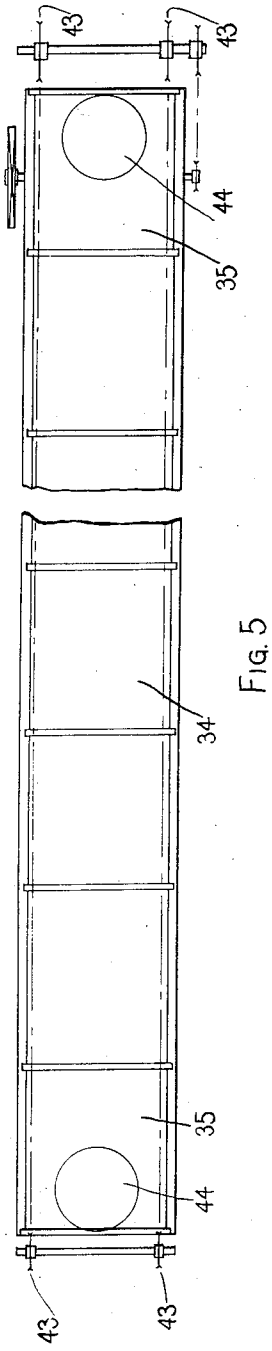


FIG. 5

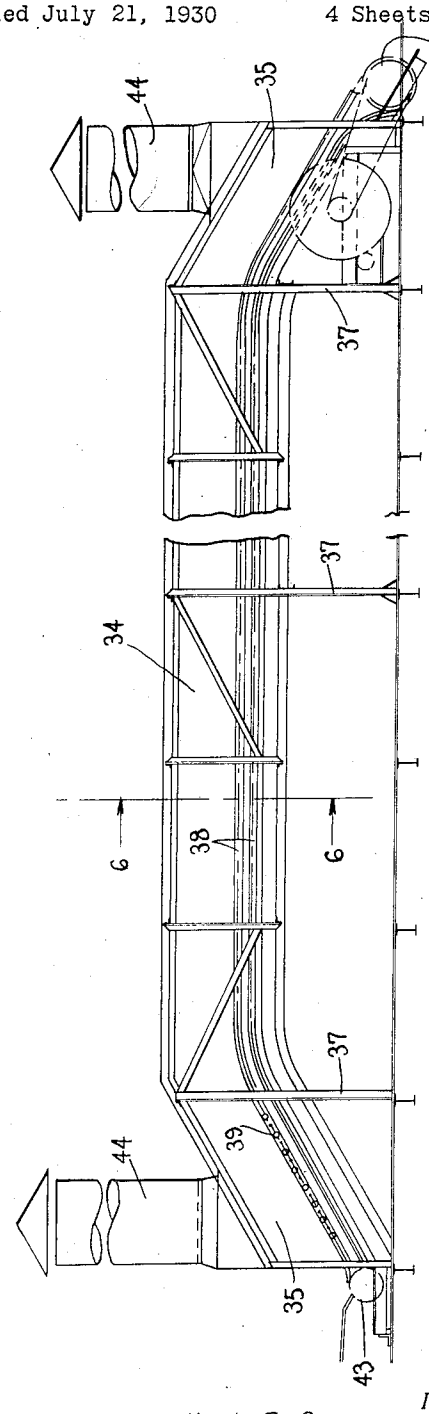


FIG. 4.

INVENTORS
Karl F. Snow and
Benjamin A. Smith
BY
Fay, Oberlin & Fay
ATTORNEYS

Patented Dec. 26, 1933 1,940,978

UNITED STATES PATENT OFFICE

1,940,978

APPARATUS FOR DRYING BARRELS AND LIKE ARTICLES

Karl F. Snow, Brecksville, and Benjamin A. Smith, Rocky River, Ohio, assignors to The C. O. Bartlett & Snow Company, Cleveland, Ohio, a corporation of Ohio

Application July 21, 1930. Serial No. 469,584

2 Claims. (Cl. 34—12)

This invention, relating as indicated, to apparatus for drying barrels and like articles, is especially adapted to be employed as a means for drying barrels and the like after the same have been hydraulically tested preparatory to painting or coating. When barrels are hydraulically tested or have moisture on the interior and exterior thereof due to any reason, considerable difficulty has been experienced in completely drying such barrels both exteriorly and interiorly prior to coating and filling. The chief difficulty with all methods of drying barrels as heretofore employed has been that the barrels have been heated and superficially dried, but upon cooling the moisture has again condensed on the barrels, especially the interior thereof, so that considerable moisture was present when the barrels were to be filled or coated.

In order that barrels be completely dried it is necessary that such barrels or like articles remain in the drying oven for at least a minimum length of time depending upon the size of the barrels or articles, and the amount of moisture which must be driven off to insure a dry surface. Drying apparatus as heretofore employed has effected the relatively long period of heating of the barrels by having such drying ovens of considerable length so that the time consumed by the barrels in passing through such long drier was sufficient to effect the proper drying of the surfaces. When the drying oven chambers are relatively long, considerable heat is dissipated and lost due to radiation, and the like.

As above indicated, when the interiors of barrels are to be dried, after such barrels have been heated, the heating of the barrel may effect a drying of the interior surface thereof since such barrels remain hot, but as soon as the barrels are permitted to cool, the moisture contained in the atmosphere on the interior of the barrel condenses, leaving a damp or wet inner surface.

It is among the objects of this invention to provide an apparatus for drying barrels and like articles which shall have none of the above named undesirable characteristics. Other objects of this invention will appear as the description proceeds. To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings;

Fig. 1 is a plan view showing the general arrangement of the barrel drying apparatus comprising this invention shown in association with other elements forming the chain of barrel handling and treating equipment; Fig. 2 is a longitudinal part-sectional, part-elevational view of the drying apparatus, shown in Fig. 1; Fig. 3 is a transverse sectional view of the apparatus shown in Fig. 2 taken on a plane substantially indicated by the line 3—3; Fig. 4 is a side elevational view of an alternative form of barrel drying apparatus; Fig. 5 is a broken plan view of the apparatus shown in Fig. 4; and Fig. 6 is a transverse sectional view of the apparatus shown in Fig. 4, taken on the plane substantially indicated by the line 6—6.

Referring more specifically to the drawings and more especially to Fig. 1, the plan view here shown includes the barrel drying apparatus 1 which has associated therewith air heaters 2, a blower 3 and motor 4 by means of which the hot air necessary to effect the drying of the barrels is produced and caused to circulate through the apparatus comprising this invention later to be described more in detail. The block 5 is employed to represent the skids or platform upon which the hydraulic testing and siphoning of the barrels is accomplished prior to their passage over the skids 6 to the barrel drying apparatus 1 which puts such barrels in proper shape to be coated or filled. The barrel drying apparatus 1 has associated therewith at its discharge end, a pair of tiltable skids 7 which are employed to transfer or convey the dried barrels onto the painting machine 8 which, when such barrels have been coated, discharges the same onto an automatically operated upsetting device 9 which places the freshly coated barrels in an upright position onto a gravity table 10.

The barrel drying apparatus more clearly shown in Figs. 2 and 3 consists of a plurality of superimposed drying chambers 11, 12 and 13, such chambers in the illustrated embodiment of this invention being three in number, although it will be understood that any number of such superimposed chambers might be employed advantageously to effect the proper drying of the barrels in the manner hereinafter more fully explained. The chambers 11, 12, 13, are substantially rectangular in form, being formed between the upright columns 14 and 15 and the sills 16. It will be noted that suitable means may be em-

ployed for the purpose of enclosing the drying chambers so that substantially separate air-tight compartments are produced through which the barrels are conveyed during the drying process.

The columns 14 and 15 have secured thereto track members 17 which are preferably in the form of angles having oppositely disposed interiorly extending legs which serve as runways for rollers 18 which form a part of a continuous conveyor chain 19. The spaced elements of the chain 19 are interconnected by transversely extending bars 20 which, as the chain is moved through the various compartments, engage the barrels 21 and cause the same to be rolled along through the several drying compartments. The chain 19 passes over sprocket wheels 22, 23, 24, and 25 in passing through, into, and out of the several compartments as most clearly shown in Fig. 2.

As most clearly shown in Fig. 3, the floors of the several drying compartments 11, 12 and 13 have positioned thereon hot air ducts 26 through which the heated air is forced by means of the blower 3 and caused to circulate through and heat the several drying compartments. The ducts 26 have associated therewith along one side, upwardly extending ducts 27 which have inwardly directed nozzles 28 adapted to project a stream of heated air against the head of the barrels, and more particularly into the bung holes of such heads, so as to drive out from the interior of the barrels the moisture laden air which has been produced by the heating of the barrel structures.

The receiving and discharging terminals of the drying apparatus are provided with barrel-receiving and discharging means which comprise substantially cylindrical structures 29 which have segmental apertures 30 and 31 formed therein. The cylindrical member 29 has a tiltable or rotatable member 32 mounted coaxially therewith, which member is substantially semi-cylindrical in form and has tangential members 33 extending laterally therefrom to serve as barrel supporting means, and means adapted to engage the inner periphery of the cylinder member 29 so that as the barrels are placed into the tiltable member 32 and such member rotated, the barrel may be fed to the dryer without having any of the heat contained in the dryer dissipated or cooled due to an inflow of cold air. The same structure is employed on the discharge end of the dryer, the only difference being the reverse order of operation just described.

As most clearly shown in Figs. 4 to 6 inclusive, an alternative form of dryer construction comprising our invention consists of a longitudinal drying chamber 34 which is elevated with respect to the terminal portions 35. The cross sectional structure of this form of apparatus as shown in Fig. 6 most clearly shows the construction thereof which consists of spaced columns 37. These columns have a frame work associated with their upper terminals, which frame work is arranged to form a substantially air-tight drying chamber through which the barrels are to be conveyed. The columns 37 have secured thereto rail members 38 which serve as runways for an endless chain 39. The spaced elements of the endless chain 39 are interconnected by means of transversely extending bars 40 which are so spaced and bent as to support the barrels which are carried by such chain on the chime rings thereof so that such barrels may be nonrotatably transported through the drying chamber without having any portion of the body thereof come in contact with any means which would cause a marking of such freshly coated body. The columns 34 on one side of the drying chamber have secured thereto an air duct 41 which extends substantially the entire length of the dryer and which is connected with a suitable source of heated air, not shown, although similar to that described in connection with Fig. 1. The air conduits 41 have associated therewith, nozzles 42 which are so positioned as to project a stream of heated air against the heads of the barrels and more especially into the interior of the barrels through the apertures usually formed in such heads. The endless chain 39 is suitably supported and propelled by means of sprocket wheels 43 as most clearly shown in Fig. 4 by means of which the chain is caused to travel at the proper speed and carry the barrels through the drying chamber.

By employing the barrel drying structures comprising our invention, the projections of streams of heated air into the barrels through the openings in the heads thereof, such air will cause the moisture laden air on the interior of the barrels to be driven out, so that, as the barrels are discharged from the drying apparatus, there will be no moisture laden air on the interior of the barrels which would permit condensation of the moisture to dampen the interior of the barrel. The projected streams of air as the barrels are moved across the same in their travel through the drying chambers, cause a circulation over the exterior surface of the barrels as well, so that both the interior and exterior of the barrels are dried in a manner superior to that effected by any apparatus heretofore employed.

The structure disclosed in Figs. 4 and 5 is particularly advantageous from the standpoint of economy of operation in that the heated air which is utilized to dry the barrels is collected in the central elevated portion of the drying apparatus and therein utilized to the greatest advantage in the drying of the barrels which are caused to pass therethrough from the lower terminal portions. The only heated air that need be supplied to the drying mechanism, as illustrated in the above named figures, is that which is necessary to maintain the proper temperature of the air in the drying chambers, and also a sufficient oversupply of heated air to cause a portion of the moisture laden air to be forced out through the stacks 44 or 45 provided for that purpose.

When the barrel feeding and discharging apparatus, as most clearly shown in Fig. 2, is employed in connection with the drying apparatus, the barrels are introduced to the drying chambers without any of the heat contained therein lost due to the hot air passing out through the aperture through which the barrels are received or discharged. The use of the above described barrel drying apparatus is particularly advantageous due to the fact that the several specific forms of construction enumerated all tend to minimize the heat lost due to radiation and the like, so that the drying operation of the barrels may be carried on most quickly and most economically. The arrangement of the several drying chambers in a superimposed relationship is particularly advantageous in that the amount of heat lost due to radiation is reduced to a minimum.

A further description of the principles comprising this invention is believed unnecessary for those familiar with the art, it being noted that only so much of the actual construction as is necessary to an understanding thereof has been spe-

cifically described, due to the fact that the manner in which the several elements described are to be constructed is so well known to those familiar with the art, that a reiteration thereof at this point is unnecessary.

Other modes of applying the principle of our invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

We therefore particularly point out and distinctly claim as our invention:

1. In apparatus for drying barrels and like articles, the combination of a drying chamber, a duct for heated air overlying the floor of said chamber, means for rolling barrels through said chamber on said duct, and an air discharge conduit associated with said duct and provided with a longitudinal orifice in line with the path of travel of said barrels to project a stream of air against the heads of and into said barrels in their passage through said chamber.

2. In apparatus for drying barrels and like articles, the combination of a plurality of superimposed drying chambers, ducts for heated air overlying the floors of said chambers, means for moving such barrels successively through said chambers, and air discharged conduits associated with said ducts along the sides thereof and provided with longitudinal orifices in line with the path of travel of said barrels for projecting streams of air into said barrels in their passage through said chambers.

KARL F. SNOW.
BENJAMIN A. SMITH.