

C. B. STILWELL.
DRIER.

APPLICATION FILED JUNE 7, 1907.

Patented Feb. 22, 1910.

3 SHEETS—SHEET 1.

949,855.

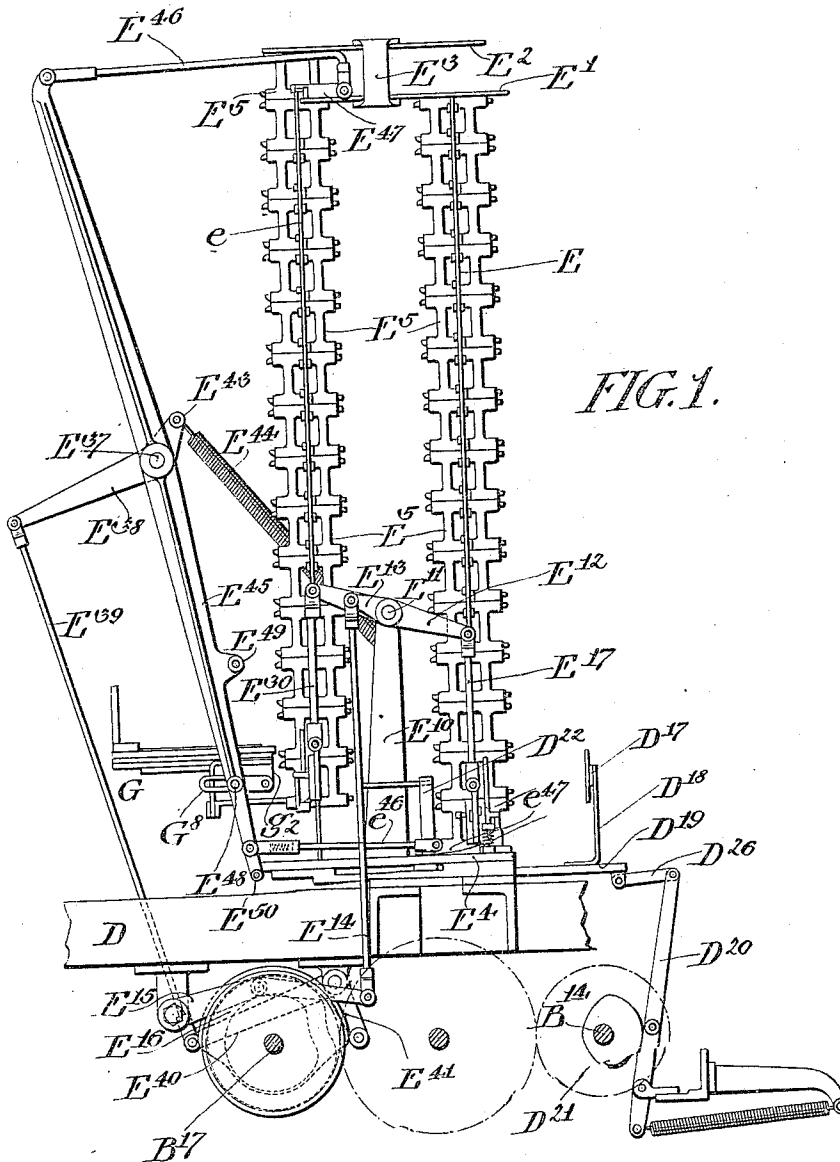


FIG. 1.

WITNESSES:

W. H. Hunt
R. J. Williams

INVENTOR

Charles B. Stilwell

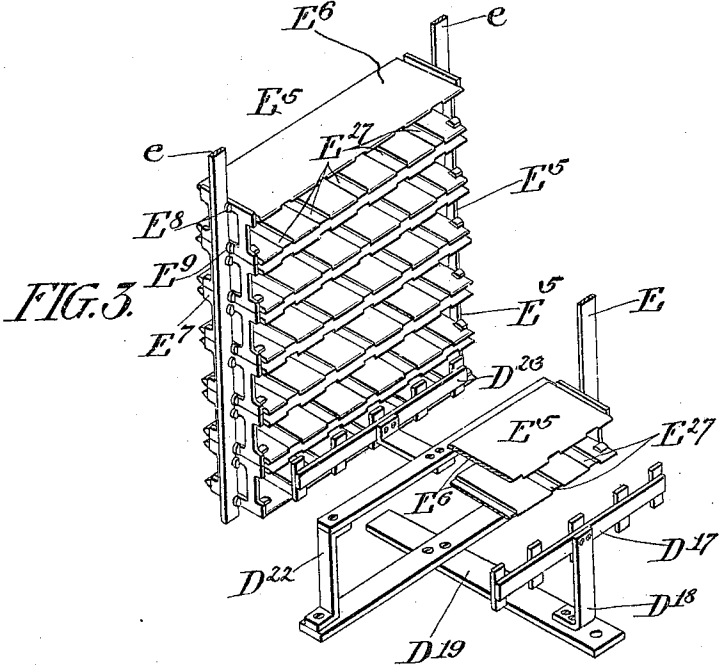
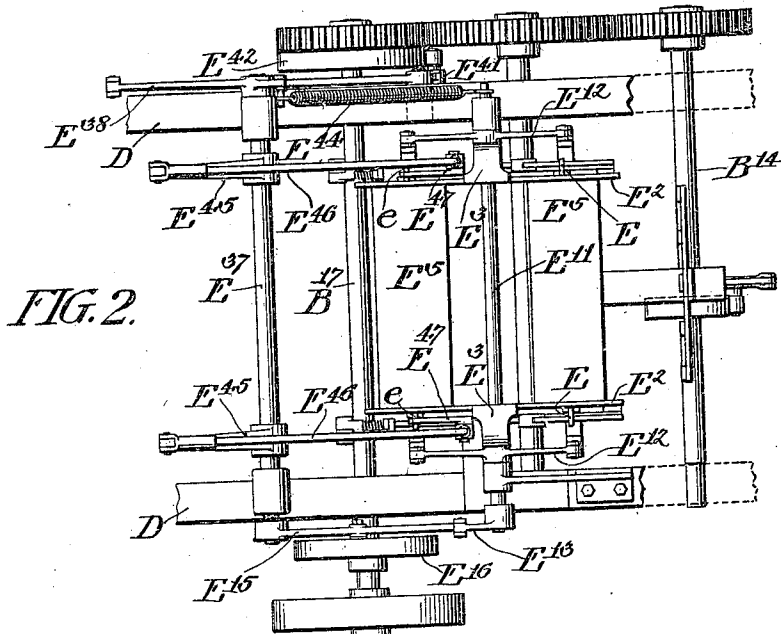
BY

Francis J. Chamber
his ATTORNEY.

949,855.

C. B. STILWELL.
DRIER.
APPLICATION FILED JUNE 7, 1907.

Patented Feb. 22, 1910.
3 SHEETS—SHEET 2.



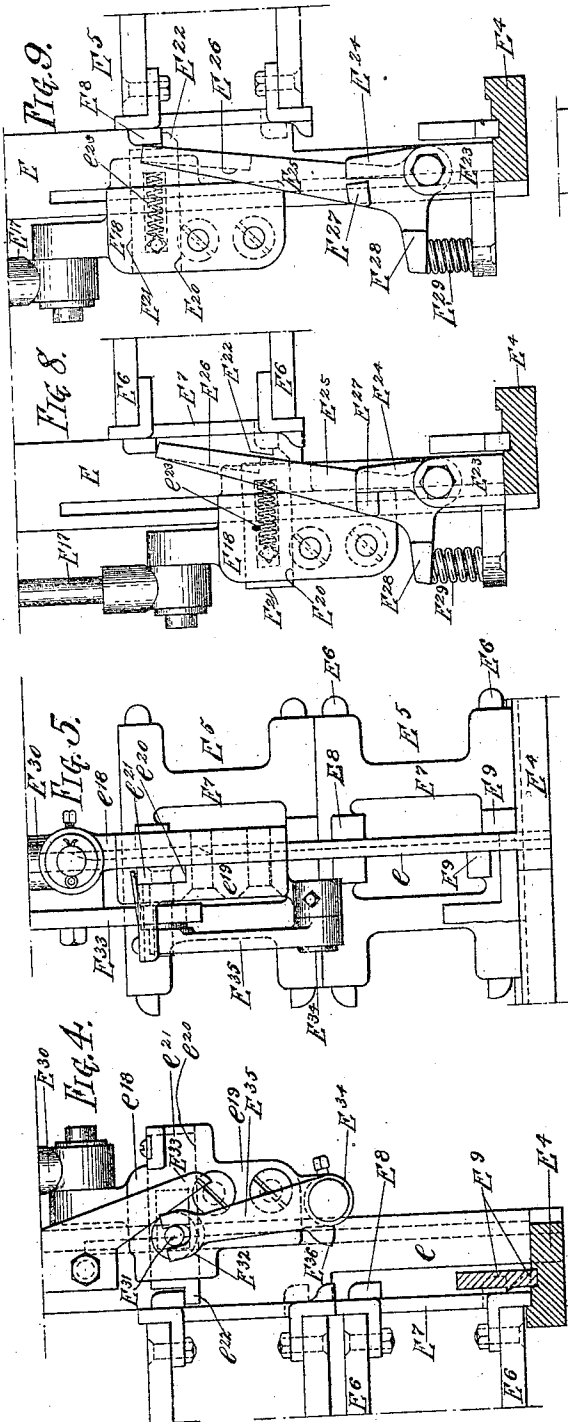
WITNESSES:
Stewart
Ed. Williams

INVENTOR
Charles B. Stilwell
BY
Francis J. Chamber
his ATTORNEY.

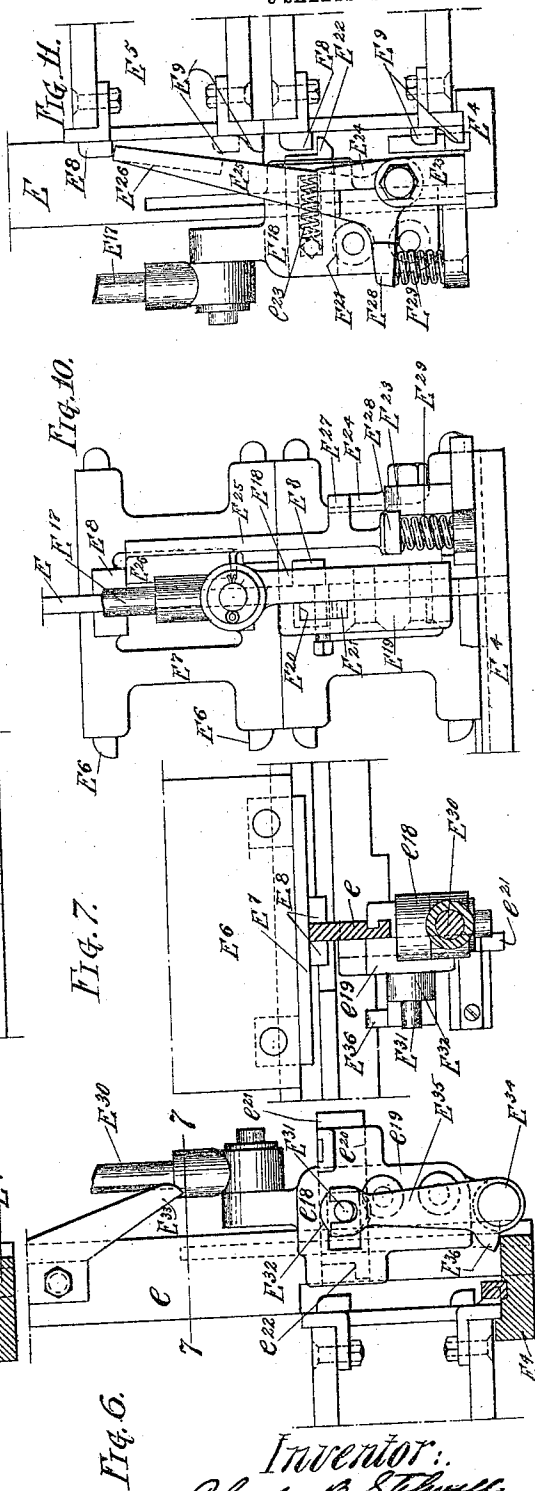
Patented Feb. 22, 1910.

3 SHEETS—SHEET 3.

949,855.



Witnesses:
Stewart
McWilliams



Inventor:
Charles B. Stilwell
by
Francis J. Chandler
his atty.

UNITED STATES PATENT OFFICE.

CHARLES B. STILWELL, OF WAYNE, PENNSYLVANIA, ASSIGNOR TO UNION PAPER BAG MACHINE COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

DRIER.

949,855.

Specification of Letters Patent.

Patented Feb. 22, 1910.

Original application filed April 26, 1906, Serial No. 313,764. Divided and this application filed June 7, 1907. Serial No. 377,680.

To all whom it may concern:

Be it known that I, CHARLES B. STILWELL, a citizen of the United States, residing in Wayne, in the county of Delaware and State of Pennsylvania, have invented a certain new and useful Improvement in Driers, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My present invention relates to apparatus for handling boxes and the like and is particularly designed for handling boxes or crates containing goods received into the boxes or crates in a moist condition and retained therein until they have dried to a desired extent after which the goods are discharged from the boxes.

The primary object of my invention is the provision of a series of boxes and crates and mechanism for manipulating them in such fashion that they form a satisfactory storage arrangement into which bunches or piles of moist goods are constantly or at regular and frequent intervals discharged as from a constantly acting machine and from which bunches or piles of goods previously received, and more or less thoroughly dried, are discharged in regular order.

The various features of novelty which characterize my invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of my invention however and the advantages possessed by it reference should be had to the accompanying drawings and descriptive matter in which I have illustrated and described one of the forms in which my invention may be embodied.

Of the drawings, Figure 1 is a side elevation of the drier mechanism. Fig. 2 is a partial plan of the mechanism shown in Fig. 1. Fig. 3 is a perspective view illustrating the construction of the drier boxes and the ejector mechanism. Fig. 4 represents in side elevation the devices for supporting one of the columns of drying boxes and for lowering the same. Fig. 5 is an end elevation of the mechanism shown in Fig. 4. Fig. 6 is a view similar to Fig. 4 showing the parts in a different position, and Fig. 7 is a partial plan on the line 7—7 of Fig. 6. Fig. 8 represents in side elevation the devices for

elevating one of the columns of drying boxes and for retaining the same in such elevated position. Fig. 9 is a view similar to Fig. 8 showing the parts in a different position. Fig. 10 is an end elevation of the mechanism shown in Fig. 8, and Fig. 11 is a view similar to Figs. 8 and 9 showing the parts in still another position.

In the particular form of my invention disclosed herein, the drier mechanism forms part of the bag packaging mechanism described and claimed in my application Ser. No. 313,764 filed 26th April, 1906, of which the present application is a division.

In the packaging mechanism of my said prior application, the bags, as received from the bag forming mechanism, are assembled in successive bunches or piles of, say, one hundred bags each, in a device which I may call a receiver. From the receiver each bunch passes to the proper drying box while the bags are still moist from the paste used to hold the parts together. After an interval calculated to give the desired drying, each bunch or pile of bags is delivered to a device which I may call a transfer case, after which further packaging operations take place.

As shown in the drawings, the drying boxes E^5 are arranged in two vertical columns or series. One of these vertical series of drying boxes is mounted to slide vertically upon the stationary guides E , and the other series of drying boxes is mounted to slide vertically upon the stationary guides e , these guides being held in position at the top by the cross pieces E' , and at the bottom by the cross pieces E^4 , which latter are supported upon the bed plate D . Brackets E^3 support the top plates E^2 , from the cross pieces E' . The top plate E^2 and cross piece E' are so arranged with respect to the edges of the cross pieces E' and E^2 as to guide the drying boxes when transferred from one of the vertical columns to the other. The uprights e extending slightly above the cross pieces E' serve as stops to limit the movement of the drying boxes during the shifting operation and to bring them into alinement with the other boxes of the series to which they are successively shifted.

The drying boxes are made up of top and bottom pieces E^6 , supported by and fastened to the side walls or ends E^7 which latter are

provided with lugs E^8, E^9 . These plates are provided with grooves e^{27} for the purpose of permitting the passage of the uprights of the discharge cross piece D^{23} . The lugs E^8, E^9 , straddle the uprights E and e , thereby holding the boxes in alinement as they are raised in one of the columns and lowered in the other. The lugs E^9 , furthermore, have the function of serving as stop lugs in the transfer of the boxes from one column to the other, and also as the points of application of the shifting levers or pushers which effect this transfer. The uprights E and e are cut away or recessed at their bottom portions to permit the passage of the lugs and also to give clearance for the lower pusher.

By reference to Fig. 1 it will now be noted that the arrangement of the drying boxes and their shifting is such that the lowermost box of the series on the guides E may receive the horizontal pile of bags ejected from a holder not shown by the ejector D^{17} . The said box is then raised and held in the raised position. In the meantime the ejector D^{23} has discharged the bags from the lowermost box of the other series into the transfer case G . Thereupon the said second series is lowered until the empty box is on a level with the vacant space formerly occupied by the lower box of the first series, and the said empty box is then shifted into this vacant space, and simultaneously the topmost box of the first series is shifted to the top of the second series. By this expedient, a sufficient period of transit is provided for each of the boxes from the time it receives its charge of bags to the time when the bags are ejected therefrom, to permit the bags to be dried to the desired degree, each box advancing step by step upwardly in the first series and downwardly in the second series, as shown.

The mechanism for raising and lowering the drying boxes consists of levers E^{12} to the opposite ends of which are secured connecting rods E^{17}, E^{30} , the former being operatively connected at its lower end with suitable devices for raising the column of drying boxes proximate to the turn over and for holding said column in such position, and the latter being provided with suitable devices for sustaining the other column of drying boxes in elevated position and subsequently lowering the same. The shaft E^{11} to which the levers E^{12} are connected is journaled in the standard E^{10} forming a part of the frame and is oscillated by means of a lever E^{13} attached thereto, said lever E^{13} being flexibly connected by a rod E^{14} with a lever E^{15} that is provided with a cam roll which coöperates with the cam E^{16} attached to horizontal shaft B^{17} .

To the lower end of the connecting rod E^{17} is attached a guide member E^{18} which slidably engages the drying box guide E . Secured to said guide member E^{18} is a mem-

ber E^{19} which is provided with a latch pocket E^{20} in which is housed a reciprocating latch E^{21} , the latter having a recess to receive the latch actuating spring e^{23} . Mounted upon cross piece E^4 at the base of the upwardly moving column of drying boxes is a member E^{23} to which is pivotally attached a bell crank lever E^{25} , the upwardly extending arm E^{26} of which is adapted to engage the under side of the lug E^8 of the drying box and to support the latter in elevated position, and the other arm E^{28} of which bears upon a spring E^{29} seated upon a horizontally extending portion of member E^{23} . For the purpose of limiting the inward movement of the arm E^{26} of lever E^{25} under the influence of the spring E^{29} , said lever E^{25} is provided with a transversely extending lug E^{27} which is adapted to contact an upwardly extending lug or finger E^{24} with which the member E^{23} is provided. It will now be noted that as the connecting rod E^{17} moves upwardly the lug E^8 of the lowermost drying box E^5 , is engaged by the corresponding end E^{22} of the latch E^{21} and that the said box, together with those superposed upon it, is raised to the height of the upper end of the arm E^{26} of the supporting latch or lever E^{25} , when such arm moves under the lug E^8 , and supports the column of drying boxes in an elevated position. Upon the downward movement of the connecting rod E^{17} the latch E^{21} is forced inwardly by engagement with the lugs E^9 , the under side of the end E^{22} of said latch E^{21} being slightly beveled for this purpose.

Pivotally attached to the lower end of the rod E^{30} is a guide member e^{18} movable vertically upon the drying box guide e . Suitably secured to the member e^{18} so as to move therewith is a member e^{19} which is provided with a chamber e^{20} for the reception of a sliding latch e^{21} having a transversely extending stud E^{31} projecting outwardly through a slot which intersects the latch pocket e^{20} . The outer end of the stud E^{31} is engaged by the forked end of the latch retracting lever E^{35} , which is pivoted at its lower end by a pin E^{34} to the member e^{19} and which is provided with a cam lug E^{36} adapted to engage the cross piece E^4 . Journaled on the stud E^{31} and interposed between the forked end of the lever E^{35} and the member e^{19} , is a cam roll E^{32} , which, near the end of its upward travel, engages the cam E^{33} , secured to the guide e , thus causing the end e^{22} of the latch e^{21} to be forced under the guide lugs E^8 upon the drying box. When the drying box E^5 has been lowered the cam lug E^{36} upon the latch retracting lever E^{35} engages the cross piece E^4 , turning the said lever upon its pivot pin E^{34} and thus positively retracting the latch e^{21} .

As the rods E^{17} and E^{30} attached to the

levers E¹² simultaneously move in opposite directions, the drying boxes of one column are raised at the same time those of the other column are lowered, and by reason of the form of the cam E¹⁶ there is a comparatively long interval of rest intervening between successive movements of the columns, thus affording ample time for forcing the bags into and out of the drying boxes and for transferring the drying boxes from one column to the other.

For the purpose of transferring drying boxes from one column to the other, a transfer lever E⁴⁵ is provided. Attached to the opposite ends of the transfer lever are rods E⁴⁶, e⁴⁶, which are respectively connected to the top and bottom pushers E⁴⁷ and e⁴⁷ that reciprocate horizontally in the guides E', E⁴. These pushers are adapted to contact the lugs E⁹ upon the drying boxes to cause the latter to be transferred from the top of one column to the top of the other column, as the case may be. As a means of actuating the transfer levers E⁴⁵ and attached pushers, the horizontal shaft E³⁷ has secured thereto a lever E³⁸ which, through rod E³⁹, is connected to the end E⁴⁰ of bell crank lever E⁴¹, the latter being suitably pivoted on the frame and being provided with a cam roll which contacts cam E⁴² upon the shaft B¹⁷. The shaft E³⁷ is also provided with a lever E⁴³ to the end of which is attached spring E⁴⁴ which, operating through the shaft E³⁷, returns the transfer levers E⁴⁵ and their attached pushers to their initial positions after the drying boxes have been transferred. The cam E⁴² upon the shaft B¹⁷ is so related to the cam E¹⁶ upon the same shaft that the transfer levers E⁴⁵ are operated to actuate the attached pushers while both columns of drying boxes are in elevated positions.

The transfer levers E⁴⁵ are provided near their lower ends with studs E⁴⁸ which form a pin and slot connection with the strap links G⁸ which are pivotally connected to portions g² of the reciprocating case. This case receives the package of bags ejected from the lowermost drying box of the descending column and transfers it to mechanism acting on the bags at a later stage in their manipulation.

The transfer levers E⁴⁵ are provided near their lower ends with studs E⁴⁸ which form pin and slot connections with the strap links G⁸ pivotally connected to portions g² of the transfer case G so that the oscillations of the levers E⁴⁵ move the transfer case from the position in which a bunch is ejected from the transfer case in a manner not disclosed herein and the levers then return the case to the position in which it receives bags from the next box E⁵.

The mechanism by which the piles or bunches of bags are transferred from the

receiver to the lower box, the one on the right hand column of Fig. 1, and are transferred from the lower box to the left hand column of Fig. 1 into the second transfer case, is actuated by the shaft B¹⁴ connected by any suitable gearing with the shaft B¹⁷. The shaft B¹⁴ carries a cam D²¹ which reciprocates a lever D²⁰, the upper end of which is connected by a connecting rod D²⁶ to a bar D¹⁹ slidingly mounted in the frame D. The bar D¹⁹ has an upright D¹⁸, carrying an ejector crossbar D¹⁷. Between the columns of drying boxes, a framework D²² is secured to the bar D¹⁹ which is provided with an arm D²⁶ parallel to the bar D¹⁹ and carrying at its forward end the ejector bar D²³. It will be understood that the shafts B¹⁴ and B¹⁷ are so geared together and the cam mechanism so timed that the ejectors D¹⁷ and D²³ operate at the proper time.

While the mechanism herein disclosed was primarily designed for use as a part of a bag packaging machine and is peculiarly adapted for such use, it will be readily understood by those skilled in the art that the invention disclosed and claimed herein has a wide range of use. It will also be understood that changes may be made in the form of my invention without departing from its spirit.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is,

1. In a drier, a plurality of columns of independent and detached drying boxes, said columns being relatively movable and mechanism for transferring the drying boxes from one column to another, said boxes being open at the sides of the columns to permit the introduction and removal of goods without disturbing the columnar arrangement of the boxes.

2. A drying device comprising two parallel columns of detached drying boxes, said columns being simultaneously movable in opposite directions, whereby a drying box of each column is caused to assume a position in which it may be transferred to the other column, mechanism for transferring the drying boxes from each column to the other column, mechanism for simultaneously moving the columns of drying boxes in opposite directions, and mechanism for introducing goods into and ejecting goods from said boxes in regular order without disturbing the columnar arrangement of the boxes.

3. A drying device comprising two vertical columns of drying boxes, mechanism for elevating one of the columns and simultaneously lowering the other column, said elevating and lowering mechanism comprising latch devices vertically movable bodily and adapted to engage and support the drying boxes, cam mechanism for timing the operation of the elevating and lowering mechanism

ism so that one of the columns of drying boxes is supported by said column operating mechanism during the transfer of the drying boxes from each column to the other and during the entrance and egress of the packages of bags, devices independent of the column operating mechanism for supporting the other column during the transfer of the drying boxes from each column to the other and until the columns are actuated, horizontally reciprocating pushers for transferring the drying boxes from each column to the other column, and a horizontally movable slide adapted to deliver a package of bags to one of the drying boxes and simultaneously eject a package of bags from another drying box.

4. A drying device comprising two vertical columns of drying boxes each drying box being open upon opposite sides to permit the entrance and egress of a package of bags, and mechanism for elevating one of the columns and simultaneously lowering the other column, said elevating and lowering mechanism comprising cam controlled levers, and latch devices operatively connected to said levers.

5. A drying device comprising two verti-

cal columns of drying boxes, mechanism for elevating one of said columns and simultaneously lowering the other column, said column operating mechanism comprising cam controlled levers having latch devices operatively attached thereto, horizontally reciprocating pushers for transferring the drying boxes from each column to the other column, and a cam controlled transfer lever operatively connected to the reciprocating pushers and adapted to simultaneously move them in opposite directions.

6. A drying device comprising two vertical columns of drying boxes, each box having two opposite sides open, mechanism for elevating one of the columns and simultaneously lowering the other column, mechanism for transferring the drying boxes from each column to the other, and a horizontally movable slide adapted to deliver goods to be dried in a box in one column and to simultaneously eject goods from a box in the other column.

CHARLES B. STILWELL.

Witnesses:

ARNOLD KATZ,
D. STEWART.