

Feb. 16, 1932.

C. R. GREEN

1,845,914

APPARATUS FOR DRYING A STEREOTYPING MATRIX

Filed Oct. 20, 1930

Fig. 1.

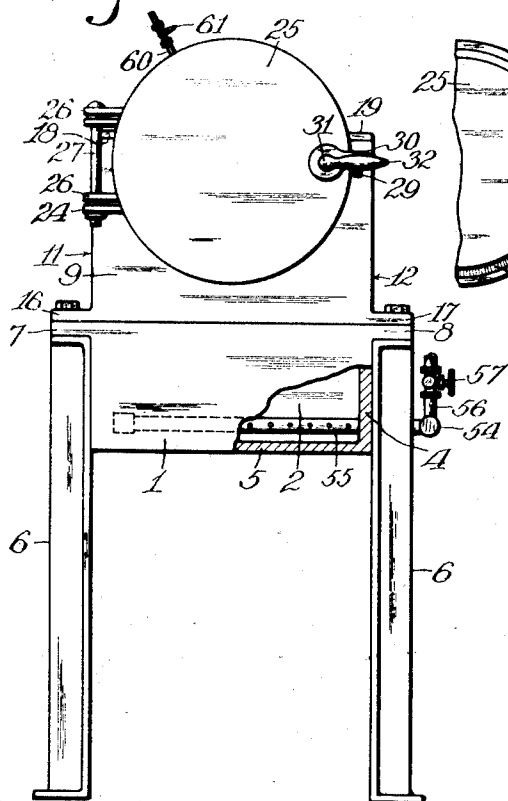


Fig. 2.

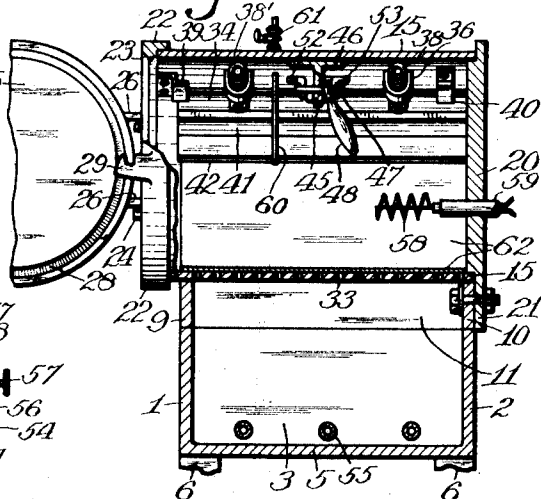


Fig. 4.

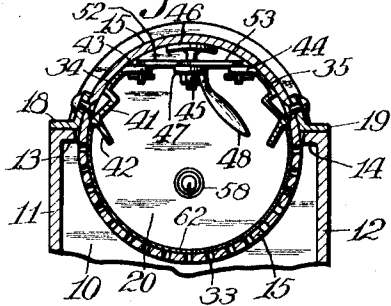


Fig. 3.

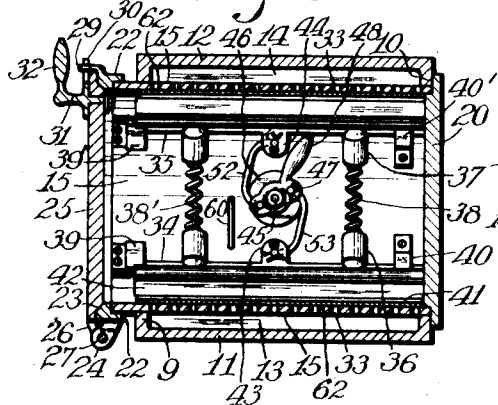


Fig. 5.

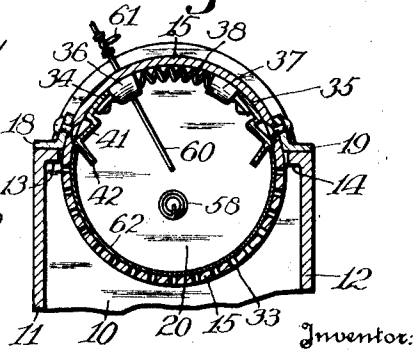


Fig. 6.



Inventor: Charles R. Green,

By E. J. Silvius,

Attorney.

UNITED STATES PATENT OFFICE

CHARLES R. GREEN, OF INDIANAPOLIS, INDIANA

APPARATUS FOR DRYING A STEREOTYPING MATRIX

Application filed October 20, 1930. Serial No. 489,927.

This invention relates generally to the subject of drying matrices following the molding thereof from which to cast stereotype plates used in modern printing presses, the invention having reference more particularly to a type of apparatus for drying a matrix in accordance with an improved method of carrying out the objects of my invention.

An object of the invention is to provide improved apparatus adapted to be used in the drying of a stereotype matrix so as to be true or symmetrically perfect, or one that is not warped or uneven.

Another object is to provide improved apparatus which shall be of such construction as to rapidly and effectively cause drying of matrices that shall have perfect normal faces to insure perfect printing faces on stereotype plates, without high spots or equally objectionable low spots that would cause indistinct printing impressions.

A further object is to provide means whereby a matrix after having been pulled from a type form may be expeditiously and completely dried, and free from unevenness that may be due to various causes or result from the necessary practice of pulling the matrix off of the type form.

A still further object is to provide improved apparatus for drying a stereotype matrix without requiring the use of troublesome devices or a separate drying press.

A still further object is to provide improved apparatus for drying a stereotype matrix that shall be of improved quality when the modern dry mat process is practiced, which apparatus shall not be costly but shall be durable, efficient and economical in use.

With the above-mentioned and other objects in view, the invention consists in novel matrix-drying apparatus adapted for use in the practice of drying a matrix under conditions insuring true form to insure a perfectly-faced stereotype plate that will not need underlaying or overlaying expedients preparatory to printing operations; and, further, the invention consists in the novel parts and in the combinations and arrangements of parts, as hereinafter particularly

described and further defined in the claims appended hereto.

Referring to the accompanying drawings,—Figure 1 is a front elevation of the improved matrix drying apparatus as preferably constructed; Fig. 2 is a longitudinal vertical central section of the apparatus of which minor portions are broken away; Fig. 3 is a horizontal central section showing principal parts of the apparatus, looking upward; Fig. 4 is a transverse section showing principal part of the apparatus on a plane approximately midway between the ends of the drying oven comprised in the apparatus; Fig. 5 is a transverse section on a plane slightly rearward of the middle portion of the oven; and Fig. 6 is a fragmentary plan view of a control lever preferably embraced in the controlling apparatus.

Similar reference characters in the different figures of the drawings indicate corresponding elements or features of construction herein referred to in detail.

The improved apparatus as preferably constructed is adapted for drying a matrix while curved so as to conform approximately to the curvature of the printing press cylinder on which the stereotype plate is to be used, the apparatus comprising a main frame part having side walls 1, 2, 3 and 4 and a bottom 5, so as to be adapted to constitute a heating chamber, the main part being provided with a suitable number of supporting legs 6, preferably four legs, the part preferably having side flanges 7 and 8 directly supported upon the tops of the legs. Preferably a separate combustion box is provided and comprises front and rear walls 9 and 10 and side walls 11 and 12, the side walls having inwardly extending cover portions 13 and 14 respectively, between which the front and rear walls are recessed and receive the lower portion of a cylindrical oven shell adapted to support a matrix while being dried. The walls of the combustion box are seated upon the walls of the heating chamber and are secured thereto, preferably by means of base flanges 16 and 17 secured to the flanges 7 and 8 respectively. Preferably supporting plates 18 and 19 are secured to the shell and to the cover portions

13 and 14 respectively. The oven shell has a back head 20 suitably fixed thereto, the head preferably having a flange extension 21 that is secured to the rear wall 10. An annular door frame 22 is suitably fixed on the forward end of the shell and has a suitable joint seat 23 facing outwardly, the door frame being provided with hinge members 24. A front door 25 is provided and has hinge ears 26 that are connected with the hinge members 24 by means of a hinge pin 27, the door having a suitable annular joint face 28 adapted to tightly fit to the seat 23. The hinge pin is so located as to permit the door to be easily swung open or to closed position. The frame is provided with a notched catch member 29, and the door has a latch 30 fixed on a spindle 31 rotatively supported by the door and having a handle 32 for lifting the latch which is adapted to readily engage the catch member when brought thereto.

The lower portion of the oven shell has perforations to constitute channels 33 for the escape of moisture and also vapor that may be generated in the drying of a matrix, and particularly to permit the escape of air that might be trapped under the matrix when placed on its bed or lower portions of the shell. The channels serve to conduct heated air directly to the matrix. In order to guide the matrix two guide bars 34 and 35 are arranged in the upper portion of the oven, both bars preferably being adjustable, each with respect to the other, and are provided with sockets 36 and 37 respectively that receive the opposite ends of a coil spring 38 which is under compression, another spring 38' being similarly mounted, to force the guide bars in opposite directions along the inner side of the shell whereby to controllably hold a matrix in place. Each guide bar is so arranged as to be guided at one end against the back head 20 of the oven, the forward ends of the bars being guided by duplex guides 39 and 39' respectively that are secured to the shell, other guides 40 and 40' being suitably located and secured to the shell to guide the bars relatively to the shell. Each guide bar has a contact plate 41 adapted to guide an edge portion of a matrix and to forcibly retain the matrix in place, each contact plate having an inclined guide plate or lip 42 whereby to guide the matrix edge to the contact plate. For controlling the guide bars and retracting them in opposition to the spring pressure, the bars are provided with ears 43 and 44 respectively, and a pivot stud 45 is supported between the ears, the stud preferably being provided with a base plate 46 secured to the upper portion of the shell, the stud appropriately supporting a lever plate 47 provided with a handle 48 for its operation. The plate 47 has a slot 49 receiving the stud and permitting equalizing movement of the lever plate, the plate having pin holes 50 and 51 therein

by which suitable links 52 and 53 are pivotally connected at one end to the lever plate, the links being pivotally connected at their opposite ends to the ears 44 and 43 respectively.

To supply heat to the oven shell and to the matrix thereon suitable means is provided, a gas header 54 being arranged outside the heating chamber and having a suitable number of gas burners 55 connected therewith that extend into the lower portion of the heating chamber, a supply pipe 56 provided with a regulating valve 57 being connected with the header. Preferably also an electric heater 58 is arranged within the oven and suitably supported by the oven wall, to heat or to superheat air in the oven for drying the face of a matrix the heater preferably having an insulating shank member 59 extending through and supported in the back head 20 of the oven.

A supply pipe 60 is suitably supported by the upper portion of the oven shell and extends therethrough, and it is provided with a suitable controlling valve 61 outside the oven, the valve being of such construction as may be desired, preferably being such as to be adapted not only to admit compressed air into the oven but to be adjusted subsequently to release the air into the atmosphere, the air under pressure or an equivalent elastic fluid being desired to force a matrix 62 uniformly into contact with the channeled portion of the oven shell constituting the matrix bed.

In practical use the gas burner may be constantly operated and regulated, and upon opening the front door 25 a matrix required to be dried is inserted endwise in the oven, the back of the matrix being undermost and sliding on the lower portion of the shell with the opposite edges of the matrix under and guided by the guide plates 42 which may readily be done after having pulled the lever handle 48 so as to draw the guide bars 34 and 35 each towards the other. When the lever plate 47 is turned until the pivots of the links 52 and 53 are approximately in alignment the guide bars are thereby prevented from returning until the lever plate is turned in the opposite direction to permit action of the springs 38 which force the contact plates 41 against the opposite edges of the matrix and hold the latter in the required place. Upon the door being closed the valve 61 is manipulated to admit compressed air preferably heated air, into the oven and the air pressure forces the matrix tightly against the bed portion of the shell, trapped air behind the matrix and vapor therefrom escaping through the channels 33, the heated shell and heated air quickly drying the matrix, but the drying may be accelerated by putting the electric heater into operation. Upon completion of the drying process the front door is opened, the lever handle 48 pulled forward to release

and hold the guide bars, after which the matrix is free and is quickly drawn from the oven in true form for use in casting the required stereotype.

5 What is claimed is:

1. A matrix-drying apparatus including a cylindrical oven horizontally arranged and having a perforated lower portion constituting a bed for a matrix, one end of the oven
10 being provided with a hinged door, guide bars adjustably mounted in the oven to guide opposite edges of the matrix, means to force the guide bars each away from the other against said edges, a pipe to conduct compressed air into the oven, and means to supply
15 heated air to the matrix.

2. A matrix-drying apparatus including a horizontal cylindrical oven having a vertical door on one end thereof and a heating chamber beneath the oven, guide bars horizontally
20 arranged adjustably in the upper portion of the oven to guide opposite edges of a matrix, and retain the matrix on the bottom portion of the oven, means to apply force laterally on the guide bars, a supply pipe extending
25 into the oven to conduct compressed air thereto, and a controlling valve connected with the supply pipe outside the oven.

3. A matrix-drying apparatus including a
30 cylindrical oven horizontally arranged and having an outward-swinging door on one end, the door being provided with a latch, opposite guide bars mounted adjustably in the upper portion of the oven to guide and to
35 hold a matrix on the inside of the lower portion of the oven, means mounted on the inside of the upper portion of the oven to adjust the guide bars, means to control the adjusting means, a supply pipe to admit compressed air into the oven, and a heater arranged in the oven.
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4. A matrix-drying apparatus comprising a heating chamber having a combustion box thereon, a cylindrical oven shell horizontally
45 supported by the combustion box and having a back head, the lower portion of the shell being perforated and located within the box, a burner arranged in the heating chamber, a door hinged to the forward end of the
50 oven shell, two opposite guide bars longitudinally arranged adjustably on the inside of the upper portion of the shell, coil springs seated on the two guide bars under compression, a lever plate pivoted to the upper portion
55 of the shell between the guide bars and having a handle, two links pivotally connected at one end to the guide bars respectively and at their opposite ends to opposite portions of the lever plate, and an air-supply
60 pipe extending into the oven shell.

5. In a matrix-drying apparatus, the combination of a hollow cylindrical oven shell horizontally arranged and provided with two
65 opposite longitudinally arranged guide-bars to guide a matrix at its opposite edges longi-

tudinally upon the lower portion of the shell, said bars being laterally adjustable on the inner side of the shell to exert lateral pressure against the opposite edges of the matrix for forcibly holding the matrix downward
70 evenly against the lower portion of the shell, a door hinged to the forward end of the oven shell, an air-supply pipe terminating in the oven shell, and means to apply heat to the matrix.

6. In a matrix-drying apparatus, the combination of a heating chamber, a cylindrical oven shell horizontally mounted upon the chamber and having a back head, the lower
75 portion of the shell being perforated and constituting a matrix bed resisting gravity pressure, a burner arranged in the heating chamber, two opposite guide and pressure bars longitudinally arranged on the inside of the upper portion of the shell, power means
80 to force one of said bars directionally from the other, means to control the power means, and an air-supply pipe terminating in the oven shell.

In testimony whereof, I affix my signature
85 on the 16th day of October, 1930.

CHARLES R. GREEN.

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