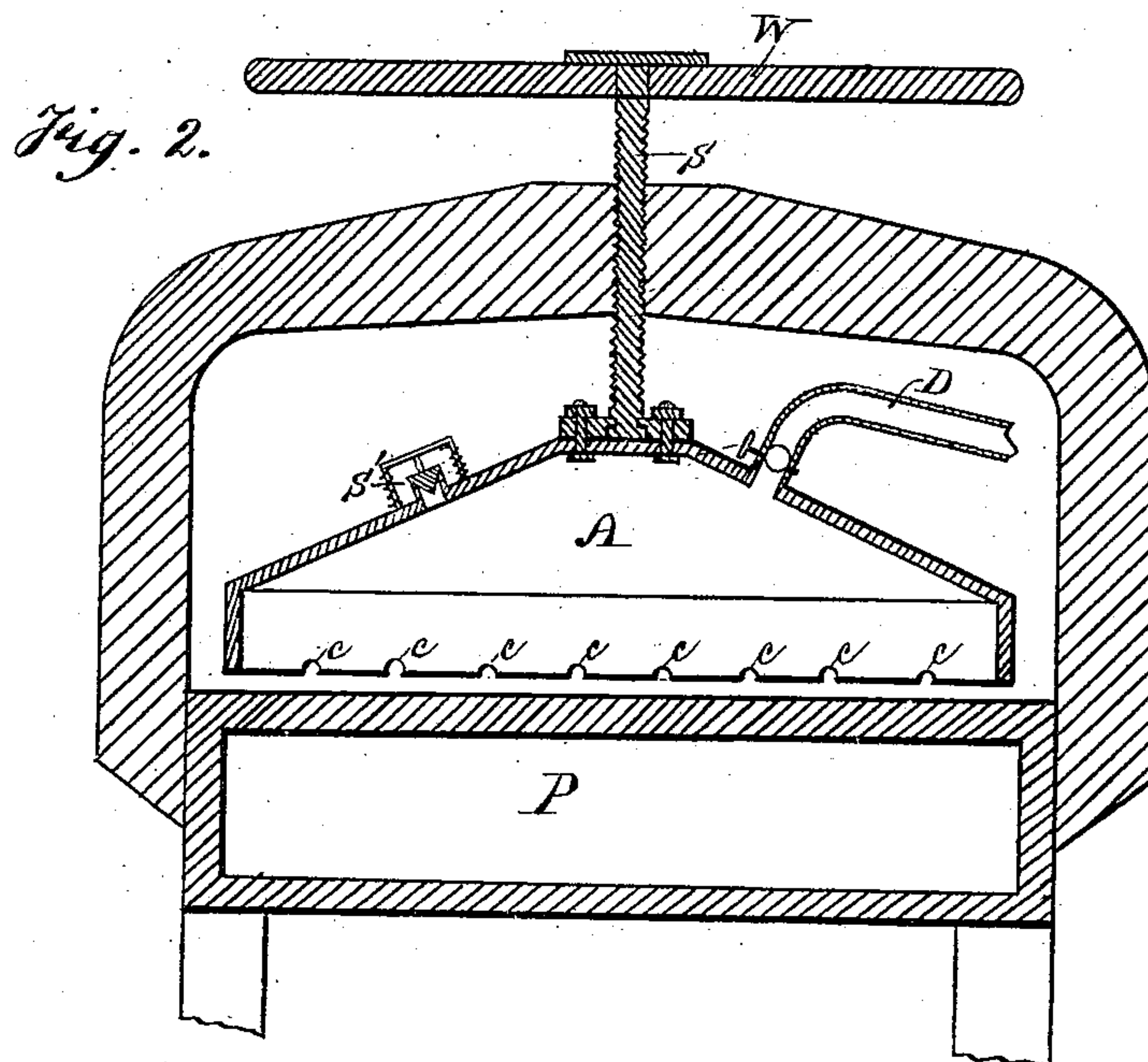
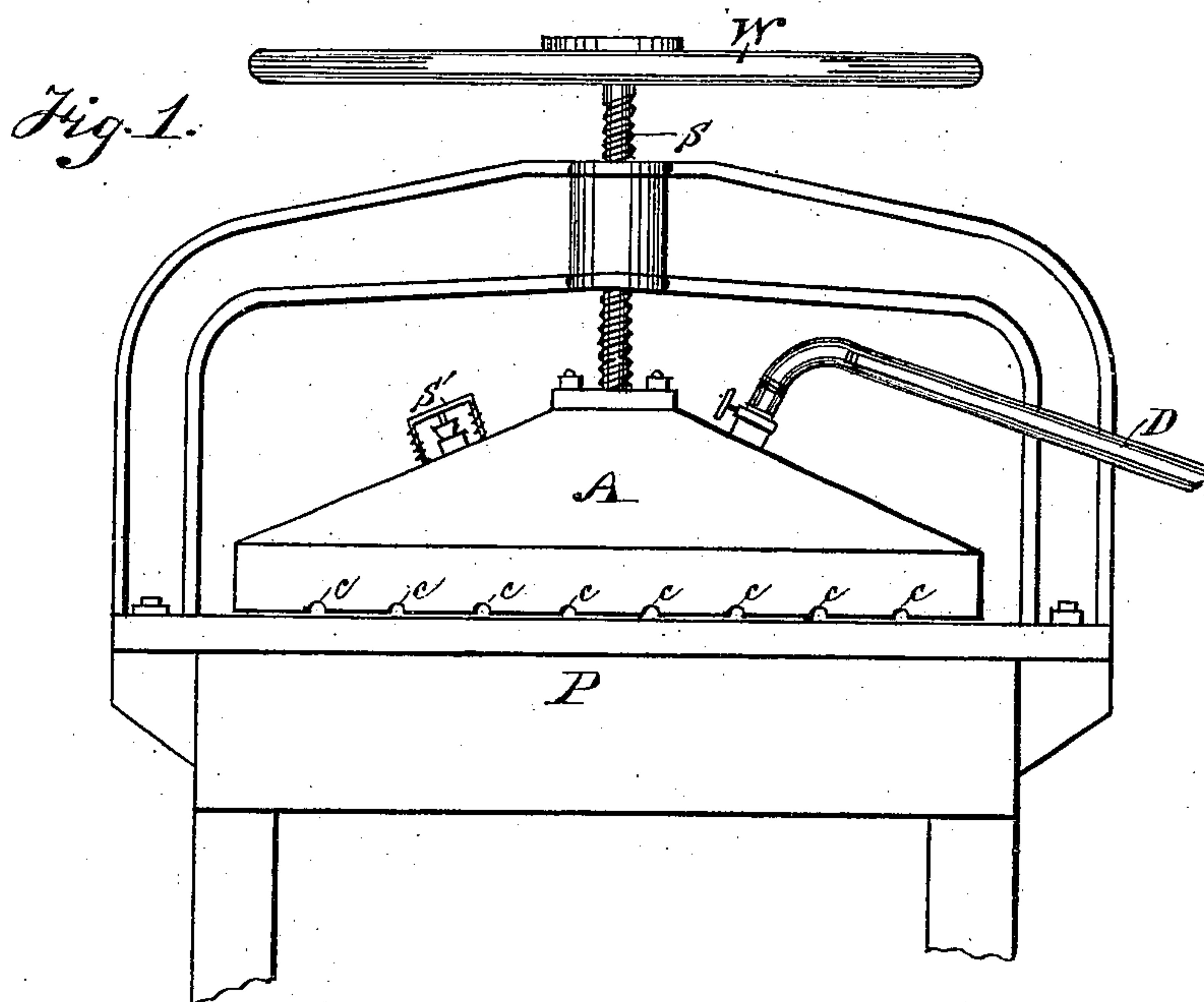


(No Model.)

W. J. JOHNSON.  
Drying Apparatus.

No. 228,259.

Patented June 1, 1880.



Witnesses:  
E. B. Hainchild  
H. G. Wadlin.

Inventor:  
W. J. Johnson  
by M. H. Brown  
Attys.

# UNITED STATES PATENT OFFICE.

WILLIAM J. JOHNSON, OF BOSTON, MASSACHUSETTS.

## DRYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 228,259, dated June 1, 1880.

Application filed April 8, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM J. JOHNSON, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Drying Apparatus, of which the following is a specification.

My invention relates more especially to that class of drying apparatus used in printing establishments for drying the matrices from which stereotype-plates are cast; and it consists in an improved method whereby the work is more perfectly performed than by the ordinary method, and with great economy of time, and also in the apparatus for carrying said method into effect, all of which is hereinafter more fully set forth and explained, reference being had to the drawings accompanying and forming part of this specification, in which—

Figure 1 shows an elevation, and Fig. 2 a transverse section, of the apparatus embodying my invention.

In most daily-newspaper establishments where the paper has a very large circulation it is usual to stereotype or reproduce the forms in order to delay going to press as long as possible, and then work off the edition with sufficient rapidity. The matrices used in casting such stereotype-plates are produced by taking an impression of the forms by means of a pulpy composition applied to the face of the type under pressure, the matrix so produced being afterward carefully dried and removed.

It is obvious that the whole operation of producing and drying the matrix in this manner and in a limited time must necessarily be a very rapid one in order to make it available. By the method of drying ordinarily pursued the matrices are placed upon a heated bed before being removed from the forms, and are covered with blankets for the absorption of the moisture, and are then subjected to pressure from an ordinary flat press-platen. By this method evaporation is retarded by the use of the blankets, and vexatious and expensive delays frequently occur on account of the difficulty experienced in drying the matrices properly and in season.

My invention is designed to obviate these difficulties; and to that end I subject the matrix to the pressure of a cushion of dry com-

pressed air in such a manner as to secure a uniform pressure upon all parts of its outer surface, whereby the matrix is kept perfectly flat upon the drying-bed, and thus prevented from warping.

To secure the removal of the moisture evaporated from the matrix, I permit a limited escape of the compressed air composing the cushion at points outside of the margin of the matrix, the escape being sufficient to remove the moisture as fast as it leaves the matrix without materially reducing the pressure of the cushion thereon.

In the application of this improved process I make use of an improved apparatus, which I will now specifically describe.

In the drawings, P represents the drying-bed usually employed in drying the matrices. A represents a hollow metallic air-chamber, of sufficient size to cover the matrix when placed upon the bed. This chamber may be raised or lowered for the introduction or removal of the matrix by means of the screw S, attached to the wheel W.

D represents an induction-pipe for the introduction of dry compressed air from proper compressing apparatus into the chamber A to form a cushion of air pressing equally upon all parts of the outer surface of the matrix.

c c c are induction-orifices in the sides of the chamber to allow a limited escape of the air outside of the margin of the matrix. These orifices, while sufficiently large for the purpose intended, are not large enough to diminish materially the pressure of the compressed air upon the matrix.

It is obvious that these orifices may be of the form shown, or may be simple notches cut in the lower edge of the sides of the chamber; or slight elevations might be made on the surface of the bed, so as to prevent the chamber from fitting closely in every part, and thus leave a small vent for the escape of the compressed air, without departing from the spirit of my invention.

To prevent undue pressure in any event upon the sides of the chamber or upon its top, the safety-valve S' is attached.

In operation the drying-bed P is heated by the introduction of steam into its interior, or by any other suitable means. The chamber



A is raised and the matrix placed upon the surface of the bed. The chamber is then lowered and dry compressed air forced into it through the induction-pipe D. The compressed air forms a cushion, pressing evenly upon the matrix in every part and maintaining it firmly upon the drying-bed and preventing it from warping in the process of drying. The heat of the bed causes the rapid evaporation of the moisture in the matrix, which moisture is removed by the limited escape of the air, as above described. In this manner the matrix may be dried in a very short time and more perfectly than by the ordinary method, while the entire operation is much simpler and more convenient than that usually employed.

In the method heretofore employed it is necessary to place the matrices upon the heated bed before removing them from the forms. The heat is found to be injurious to the types, causing them to adhere and requiring them to be knocked apart before they can be distributed, and so rendering them liable to become misshapen. The alternate heating and cooling to which the type is subjected in repetitions of the drying process also seriously impairs its durability.

By my improved process above described, and by the use of my improved apparatus, it is possible to dry the matrices after they have been removed from the forms as well as before removal, thus preventing the injury to the type ordinarily incurred.

The compressed air introduced into the chamber may be either hot or cold; but as hot air will materially facilitate the drying process, I prefer its use.

Though primarily intended for drying the matrices used in casting stereotype-plates, my invention is equally applicable for drying any article formed of plastic material molded while wet, and which is required to be confined upon a rigid bed, either flat or of other form, while being dried.

I am aware that in drying the gummed backs of postage-stamps a current of warm air has been forced by a rotating fan upon the gummed surface; but I am not aware that in any apparatus of this nature a cushion of compressed air has ever been confined over the sheet to be dried so as to press uniformly

on all parts of its outer surface and prevent it from warping during the drying operation. Such a pressure is of the first importance in drying matrices.

Having thus described my invention, what I claim is—

1. The method of holding a matrix while it is being dried, consisting in supporting the matrix upon a rigid bed and applying to its outer surface a cushion composed of compressed air, which is supplied by a suitable compressing apparatus, and is confined over the matrix to exert a uniform pressure on the entire outer surface of the latter and prevent it from warping, as set forth.

2. The method of holding a matrix and conducting moisture therefrom, consisting in supporting the matrix upon a rigid bed and applying to its outer surface a cushion composed of compressed air, which is supplied by a suitable compressing apparatus, and is confined over the matrix to exert a uniform pressure on the entire outer surface of the latter, and is allowed to escape at points outside of the margin of the matrix sufficiently to carry off the moisture from the matrix without materially reducing the pressure of the cushion thereon, as set forth.

3. As a means for applying a cushion of compressed air to a matrix, the combination of the matrix-supporting bed and the movable chamber open on the side adjacent to the bed, and provided with an induction-pipe communicating with a suitable air-compressing apparatus.

4. The hollow metallic air-chamber A, provided with an induction-pipe, D, and an eduction orifice or orifices of smaller capacity than the induction-pipe, in combination with a heated bed, P, for subjecting the matrices used in casting stereotype-plates to a continuous current of compressed air, substantially in the manner and for the purpose set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 27th day of March, A. D. 1880.

WILLIAM J. JOHNSON.

Witnesses:

H. G. WADLIN,  
C. F. BROWN.