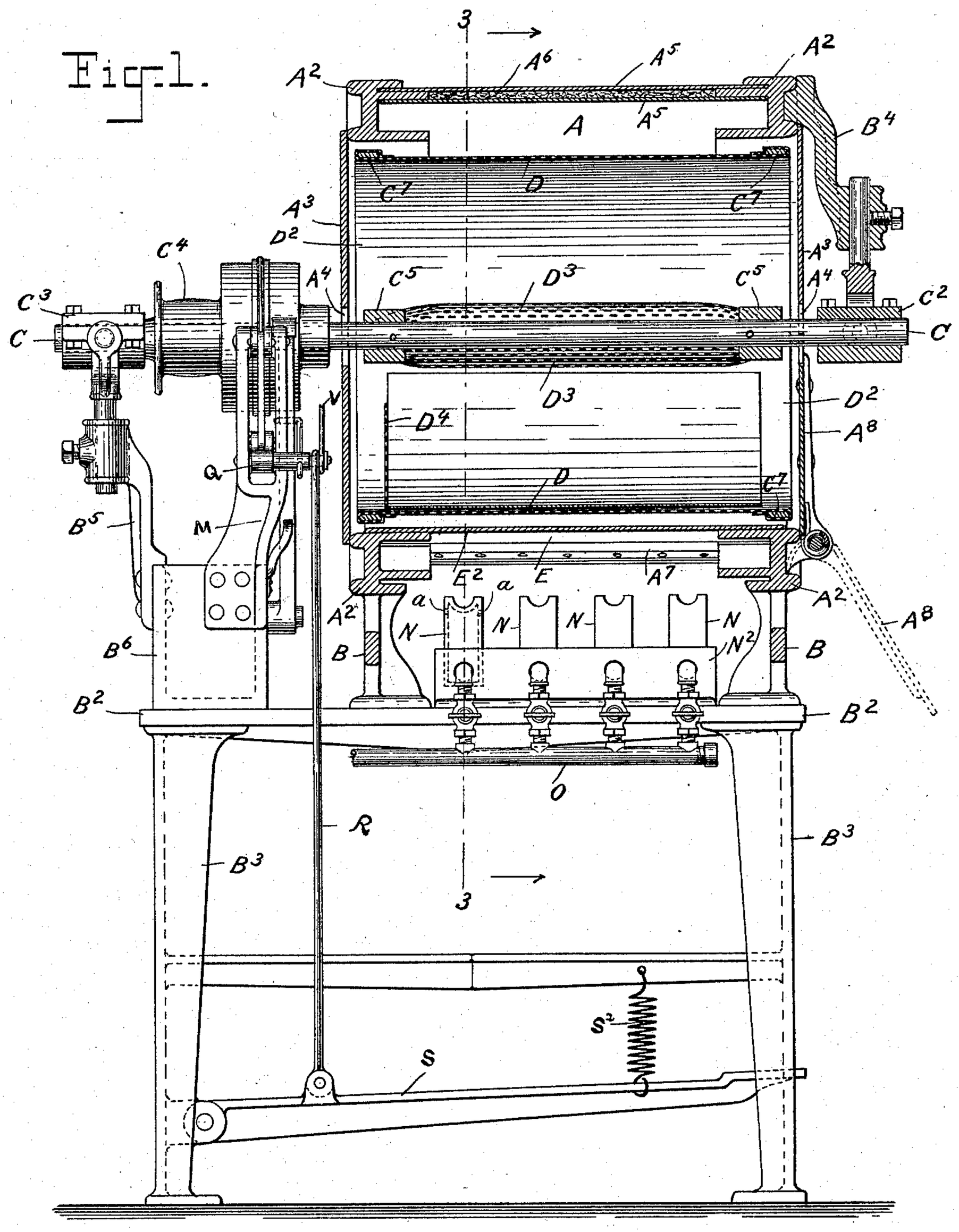
(No Model.) 2 Sheets—Sheet 1.

E. & A. E. HALL.

MACHINE FOR DRYING MATRICES.

No. 518,569. Patented Apr. 17, 1894.

Fig. 1.



Witnesses.
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(No Model.) 2 Sheets—Sheet 2.

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MACHINE FOR DRYING MATRICES.

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Fig. 3.

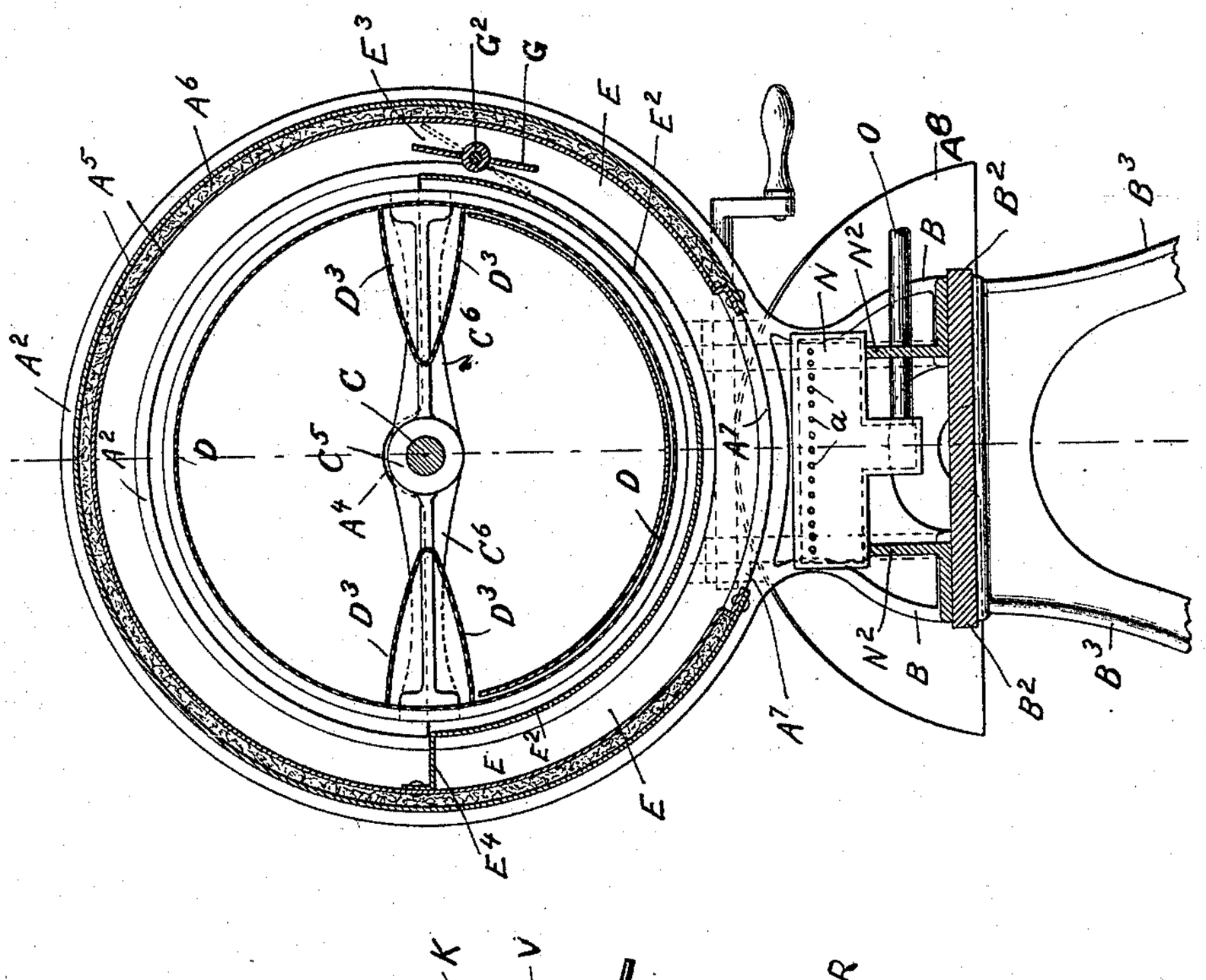
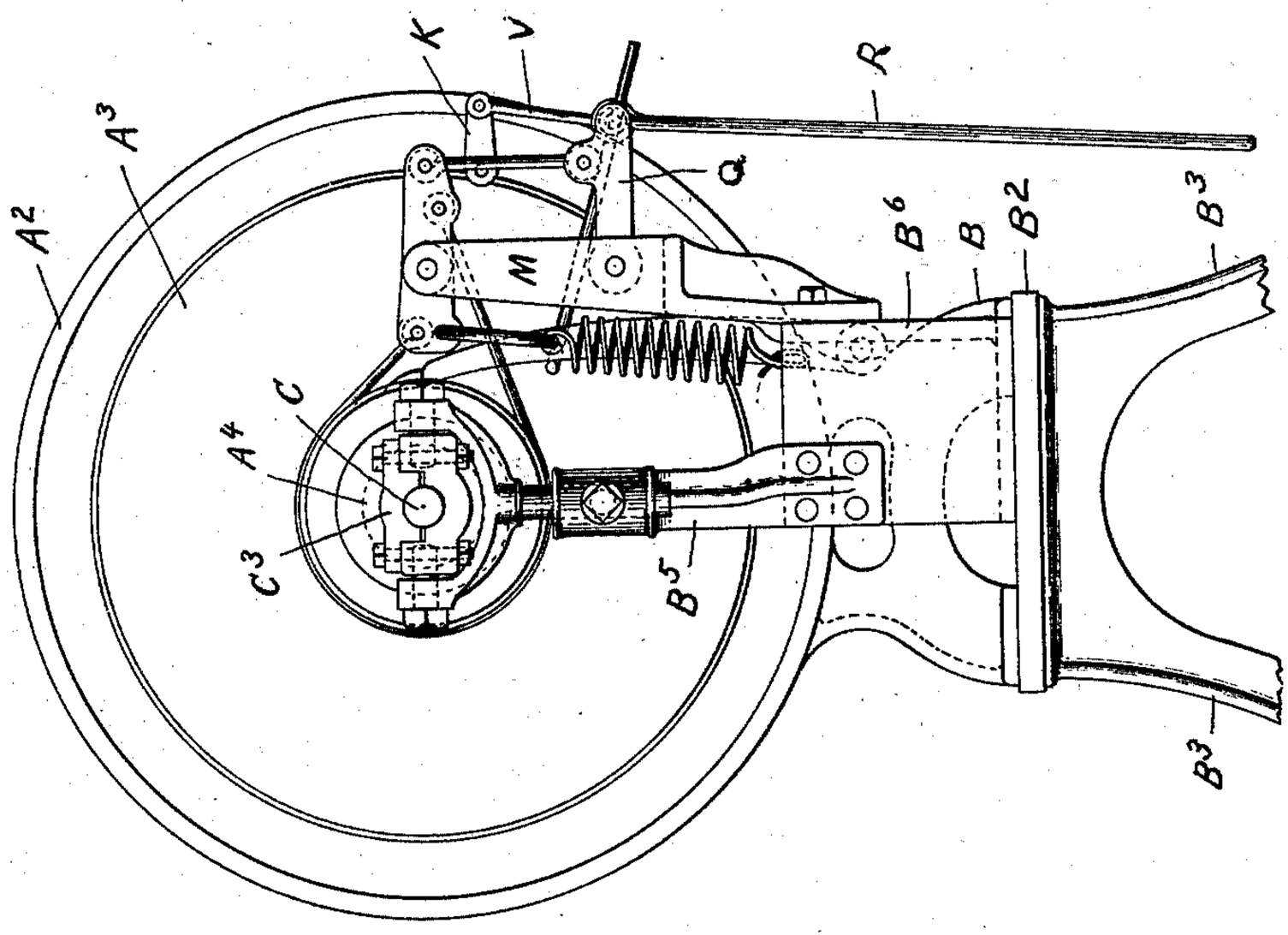


Fig. 2.



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UNITED STATES PATENT OFFICE.

EDGAR HALL AND ALBERT E. HALL, OF CAMBRIDGE, MASSACHUSETTS.

MACHINE FOR DRYING MATRICES.

SPECIFICATION forming part of Letters Patent No. 518,569, dated April 17, 1894.

Application filed November 26, 1892. Serial No. 453,254. (No model.)

To all whom it may concern:

Be it known that we, EDGAR HALL and ALBERT E. HALL, subjects of Her Majesty the Queen of Great Britain, and residents of the city of Cambridge, in the county of Middlesex and State of Massachusetts, have jointly invented certain new and useful Improvements in Machines for Drying Matrices, of which the following is a full, clear, and exact description.

This invention relates to machines for drying type form matrices made of paper, or pulp board, or such like, and the invention consists in certain arrangements and constructions of mechanisms, all substantially as and with the results and advantages hereinafter described.

In the drawings, forming a part of this specification, Figure 1 is a central, longitudinal, vertical section and a side elevation, but respectively at different end portions of the machine. Fig. 2 is an elevation at one end of the machine. Fig. 3 is a transverse vertical section, line 3—3, Fig. 1.

In the drawings, A is a hollow drum or cylinder, stationary and horizontal. This drum A, at its opposite ends, is supported on vertical brackets B of a horizontal and rectangular table B^2, supported by legs B^3, located at its several corners, and severally constituting, together with a few parts hereinafter explained, the supporting framework for all the stationary and working parts of the machine. This drum A is made of similar and annular end-frames A^2, of flat disks A^3 closing the annular frames and each having a central opening A^4, and of a double walled side A^5, filled with asbestus A^6, or other non conductor of heat, and at its lowermost portion having a slotted longitudinal opening A^7.

C is a horizontal shaft which extends lengthwise of and through the end-openings A^4, and its axis is coincident with that of the drum A, and, at its opposite end-portions and outside of the drum, it is arranged to turn in suitable bearing-blocks C^2, C^3, one C^2 of which is dependent from and vertically adjustable on an arm B^4, held on and dependent from the upper portion of one of the drum-end-frames A^2, and the other, C^3 of which is vertically adjustable on an upright B^5 secured to a block B^6 held on the table B^2.

C^4 is the driving-pulley, which is in fast and loose parts, to be clutched and unclutched, as well known, or, more preferably, by means of a friction-clutch and mechanism for operating the same, constituting the subject matter of another application, Serial No. 484,322, for Letters Patent of the United States, and to which reference is hereby had.

C^5, C^5 are collars, one at each opposite end-portion of and fixed on the shaft C, inside of the drum A. Each collar C^5 has a diametrical arm C^6, of equal radial length at opposite sides of the collar and this arm at its opposite outer ends is joined and secured to the inner circumference of and about a ring C^7 all so as to form a wire-screen cylinder D, open at its opposite ends D^2, D^2, and of a diameter suitable to rotate freely within the end annular-frames A^2. The screen-cylinder D is concentric with the drum A.

D^3 are wire-screen partitions which extend end to end of the cylinder-screen and between the diametrical-arms, dividing the inner surface of the screen itself into sections, at opposite sides of the diametrical-arms C^6. The end-disk A^3 of the stationary drum A which is toward the shaft bearing-block C^2 has a hinged door A^8 adapted to be opened, to expose the open end of the cylinder-screen D adjacent thereto, for the insertion and removal of a matrix to be dried, and its disposition about the inner surface of the screen-cylinder; a vertical screen-partition D^4 of the said cylinder-screen, acting as a stop and limit to the extent that the matrix can be inserted.

E is a chamber, at and extending around the lower portion of the drum A and separated from the screen-cylinder D by a closed partition E^2 secured to the annular end-frames A^2 of the drum. The upper end E^3 of the closed chamber E along one side of the drum is permanently closed and at its upper end E^4 at the other side of the drum is a damper G fixed on a shaft G^2 both of which extend the length of said end E^4 of said chamber E and the shaft G^2 turns in bearings of the annular end-frames A^2 of the stationary

drum A. This damper other than above explained is, as shown in the drawings, arranged so that swung, in one direction, it opens and swung, in the other direction, it closes said end E^4 of said chamber E.

S is a treadle-lever fulcrumed, and having a spring S^2 to return it to its normal position.

R is a vertical rod connecting the treadle S to one end of a lever Q, that, at its other end, is fulcrumed on a stationary support M.

V is a vertical rod, connecting the end of the lever Q, referred to as connected to the treadle, to a crank-arm K of the damper-shaft G^2. The damper is closed by depressing the treadle, and is opened by, or on the return of the treadle. These movements of the treadle are also preferably to be utilized to clutch and unclutch, the driving-pulley C^4 and driving-shaft C, simultaneously, or substantially so, with the closing and opening of the damper as above explained, and by reference to the other application which has been mentioned, the manner in which the treadle-lever S can be utilized for that purpose, is fully set forth.

Between the end supporting brackets B of the fixed drum A and directly below the slotted opening A^7 of said drum, are located a series of separate burners N, each rectangular in shape and provided along its opposite sides with jet-holes *a*. The several burners are supported by angle-plates N^2 on the table B^2, and they are in separate communication with a common supply-pipe O, and in a manner to secure combustion at their respective jet-holes of gas and air, &c., which may be delivered to them by said supply-pipe O.

The screen-cylinder D is first provided with the type-form matrix desired to be dried by entering it through the door-opening A^8 of the stationary drum A, on which the door is closed, and so provided, assuming that the screen-cylinder and its surrounding drum at its chamber E is sufficiently heated because of the combustion at the burners N and that the damper is closed, the screen-cylinder, with the matrix, is put into rapid rotation and so the matrix is submitted to heated air then about and within the screen-cylinder and imparted thereto, when the damper is closed, by radiation from the wall or partition E^2 of the chamber E, and when the damper is open, which is when the screen-cylinder is stationary, communicated to the screen-cylinder, not only by radiation as before stated, but also by its direct entrance into the screen-cylinder at the then open end E^4 of the chamber E. On completing the drying of the matrix the rotation of the screen-cylinder is stopped and the damper is opened, followed by opening the door of the drum, on which the dried matrix is then withdrawn and another matrix is inserted and so on as before. The screen partition D^3 of the screen-cylinder D prevents movement of the matrix around the cylinder as the matrix is being dried and also obviates the possibility of injuring the edges of the matrix.

The screen-cylinder in which the matrix is placed and dried as stated, is advantageous in that it affords free circulation of heat about and without possibility of injury to the matrix and also practically exposes the matrix at all points of its surfaces to heat.

The advantages of surrounding the lower portion of the screen-cylinder with a stationary chamber E open to the flames from the burners N at all times, but closed to the screen-cylinder when the cylinder is under rotation, are that the flames of the burners are in no manner affected by the draft created by the rotating screen-cylinder, and the matrix can have no contact with the flames and yet the matrix is at all times being subjected to a steady and high degree of heat.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. A stationary drum A open at its lower portion, and burners N, located opposite to said open portion of the drum, in combination with a rotating wire screen-cylinder D contained within the drum A, and a stationary chamber E about the lower portion of and separate from said rotating cylinder and open to the burners N, and at one of its upper ends closed and at the other of its upper ends having a damper adapted to open and close it substantially as described, for the purposes described.

2. A stationary drum A open at its lower portion, and burners N, located opposite to said open portion of the drum, in combination with a rotating wire screen-cylinder D contained within the drum A and having a screen partition dividing it into sections, and a stationary chamber E about the lower portion of and separate from said rotating cylinder and open to the burners N, and at one of its upper ends closed and at the other of its upper ends having a damper adapted to open and close it, substantially as described, for the purposes described.

In testimony whereof we have hereunto set our respective hands in the presence of two subscribing witnesses.

EDGAR HALL.
ALBERT E. HALL.

Witnesses:
ALBERT W. BROWN,
MARY W. STORER.