

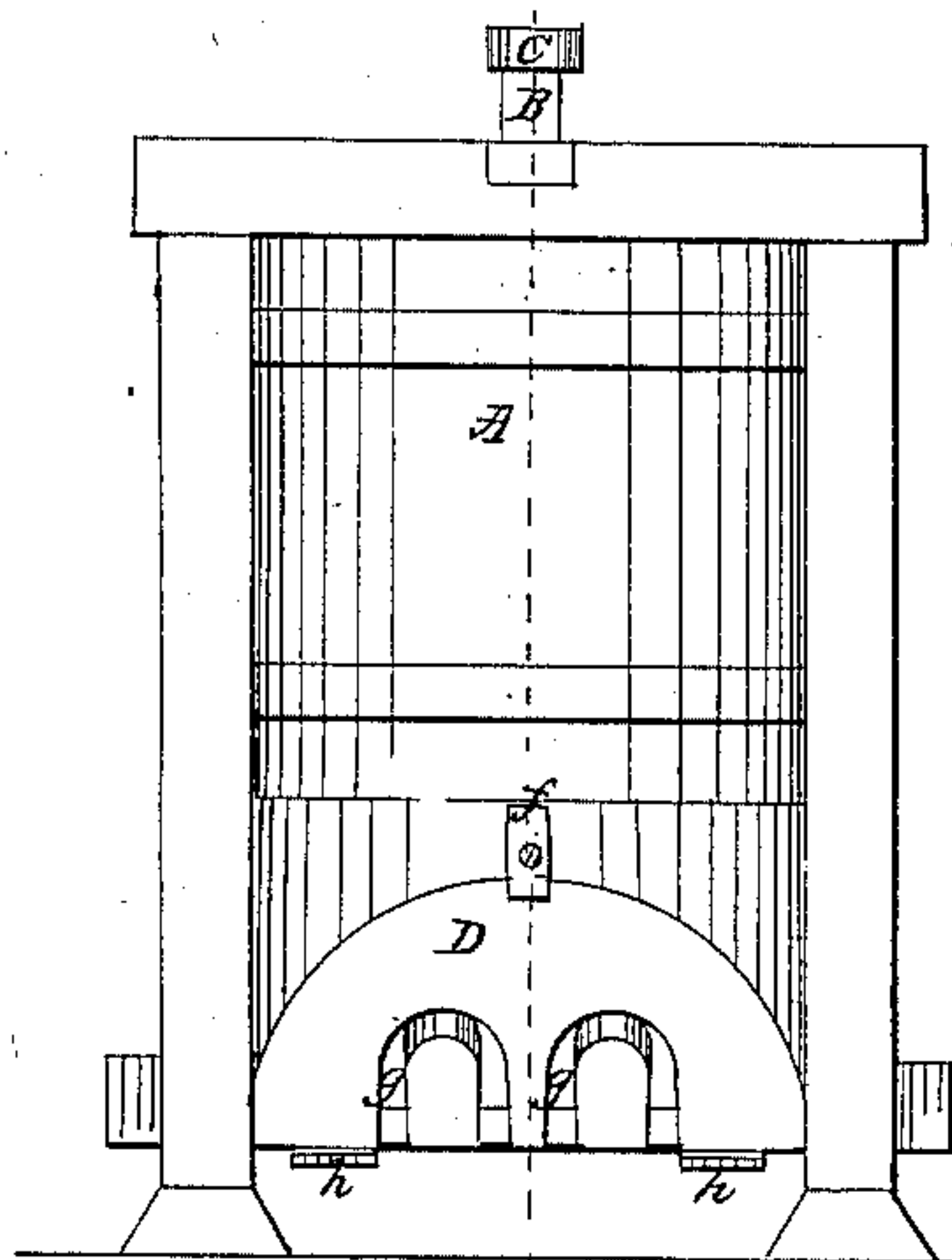
*J. Hotchkiss,*

*Tile Machine,*

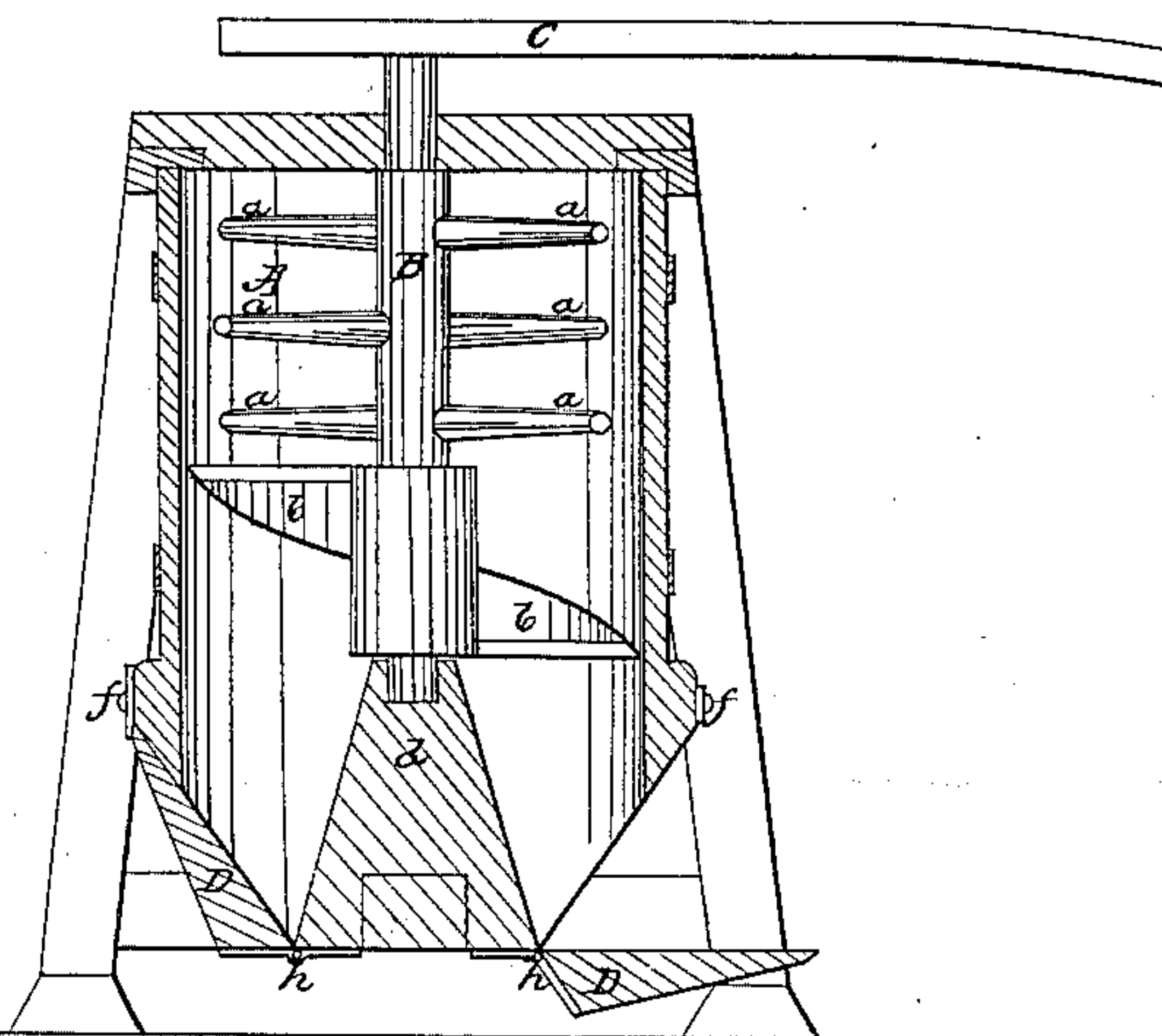
*Nº 27,669,*

*Patented Mar. 27, 1860.*

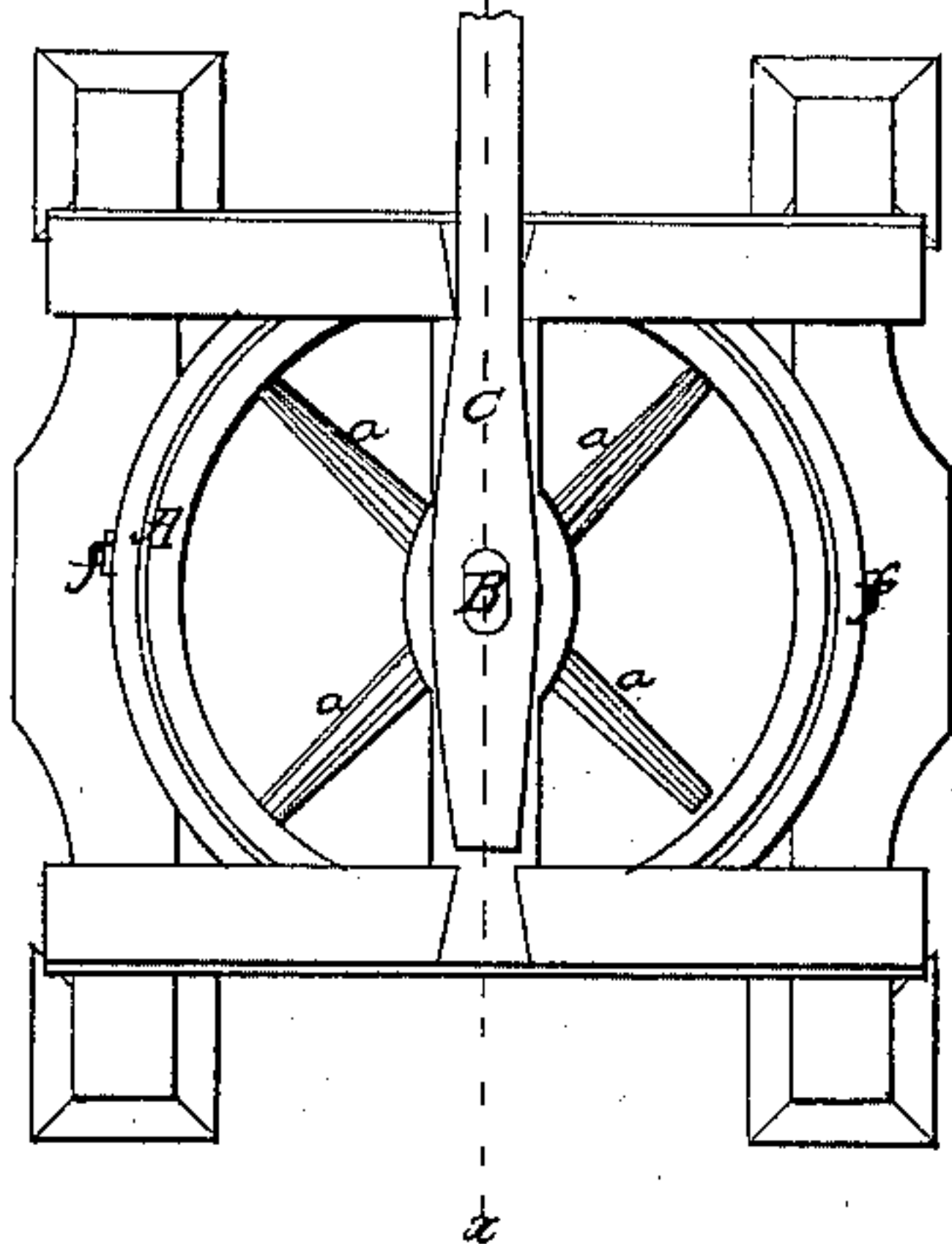
*Fig 1.*



*Fig 3.*



*Fig 2.*



*Witnesses;*

*J. Butler*

*E. P. H. Capron*

*Inventor;*

*James Hotchkiss*



# UNITED STATES PATENT OFFICE.

JAMES HOTCHKISS, OF YELLOW SPRINGS, OHIO, ASSIGNOR TO HIMSELF AND E. P. H. CAPRON, OF SAME PLACE.

## DRAIN-TILE MACHINE.

Specification of Letters Patent No. 27,669, dated March 27, 1860.

*To all whom it may concern:*

Be it known that I, JAMES HOTCHKISS, of Yellow Springs, in the county of Greene and State of Ohio, have invented a new and  
5 Improved Drain-Tile Machine; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

10 Figure 1, being a side elevation of the machine; Fig. 2, a plan thereof; Fig. 3, a vertical section thereof, in the plane indicated by the line  $x-x$ , Figs. 1 and 2.

Like letters designate corresponding parts  
15 in all the figures.

The tub, or vessel, A, in which the clay is put, may be, in its upper portion, similar to the ordinary pug-mill, for tempering clay, and the same office is performed therein. It  
20 is mounted in suitable frame-work for sustaining all the parts. The bottom of this vessel terminates, on opposite sides, in oblique, or bevel, planes, against which the die-plates D, D, fit, as shown in Fig. 3. Between the lower terminations of these planes,  
25 a block  $d$ , narrowing upward therefrom to its top, is located, as represented in the same figure. It reaches upward across the interior of the vessel, say a little higher than the  
30 upper edges of the apertures closed by the die-plates; and in its narrow, upper edge is mounted the vertical, central shaft B, from the upper part of which project radial arms  
35  $a, a, a$ , and on whose lower part are secured spiral wings  $b, b$ , the surfaces of which together extend across nearly the whole interior space of the vessel. The arms  $a, a$ , are for tempering the clay; and the spiral  
40 wings  $b, b$ , are for forcing the clay downward and outward through the die-plates D, D. These spiral wings should properly turn close above the upper edges of the die-plates D, D, so as not only to render the machine as compact as may be, and to avoid  
45 unnecessary friction, but also to apply the pressing force as close to the dies as possible. The shaft B, is turned by a sweep C, or by any other means.

The die-plates are hinged at their lower  
50 edges to the block  $d$ , or bottom of the vessel, as at  $h, h$ , so that they can be turned down, as shown, at the right hand, in Fig. 3, for any purpose of getting access to the interior of the vessel, or to the dies, more conveniently. They are secured up to the side of

the vessel, for working, by any suitable fastenings  $f, f$ . These die-plates are made as thick as practicable, whereby smoother and stronger tiles are made. The lower sides are also made thicker than the upper sides,  
60 as shown, so that, in the formation of the tile thread, it may gradually turn to a more nearly horizontal position, and still be smooth and unbroken. As the tile thread is produced, it is received upon an endless belt,  
65 or apron, made generally of canton flannel, and moving in a horizontal, or nearly horizontal, position. The tiles are cut off by a fine wire stretched upon a frame, which passes quickly down, and cuts off the con-  
70 tinuous tile thread. The most effectual inclination of the die-plates may be stated to be that of 45 degrees, both to the horizontal and vertical position; so that the advantage of the direct vertical pressure may be as  
75 nearly attained as practicable, while the approach to a vertical position is sufficiently near to enable the tile thread to be spun out upon the endless apron situated as above  
80 specified. But I do not wish to limit myself to a specified angle, since I desire to allow a variation from that herein given, to such a degree as not to materially injure the good effect attained by the arrangement of the  
85 die-plates in connection with a vertical pug-mill, and the inclined step-block  $d$ , thereby producing a nearly direct action, and, on the other hand, not to interfere with the passing of the tile thread upon said horizontal, or nearly horizontal apron.  
90

The peculiar advantages of the form and arrangement above specified, are the cheapness, simplicity and compactness of the machine, the rapidity and efficiency with which  
95 it is worked, and by the combined action of the spiral wings  $b, b$ , and the wedge-shaped block  $d$ , which separates the clay equally to the two dies, and, by its faces being uniformly opposite to the inner faces of the die-plates which are thicker at the  
100 bottom than at the top, and wedging the clay down between them, forces the clay through the dies with great uniformity of pressure, great regularity and superiority of work are produced, and especially the ad-  
105 vantage of the horizontal pug-mill, or tile machine—that of being able to produce and convey away a continuous tile thread—is obtained; while the disadvantages—of losing the pressure of the clay's weight, and of the  
110

difference of pressure arising from difference in height of the clay, at the upper and lower side, peculiar to a horizontal machine—are obviated.

5 What I claim as my invention and desire to secure by Letters Patent, is—

The combination and arrangement of the spiral wings *b, b*, situated on the pug-mill shaft, the wedge-shaped, dividing step-block  
10 *d*, and inclined, or obliquely situated, die-plates *D, D*, constructed as described, sub-

stantially in the manner and for the purposes herein specified.

In witness that the above is a true specification of my improved drain-tile machine, 15  
I hereunto set my hand, this 19th day of September, 1859.

JAMES HOTCHKISS.

Witnesses:

JOHN BUTLER,  
E. P. H. CAPRON.