

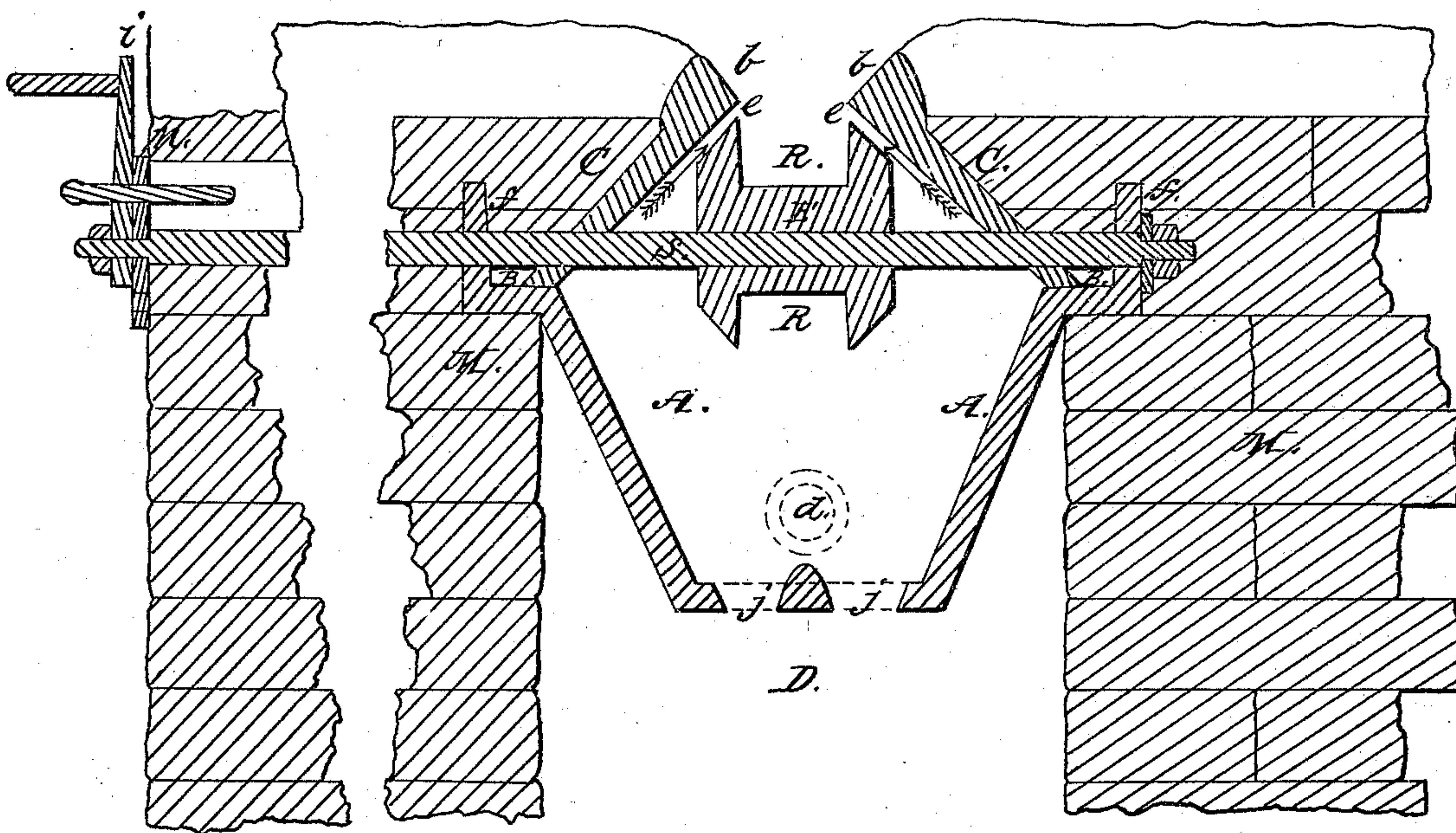
*J. W. Crannell,*

*Tuyere,*

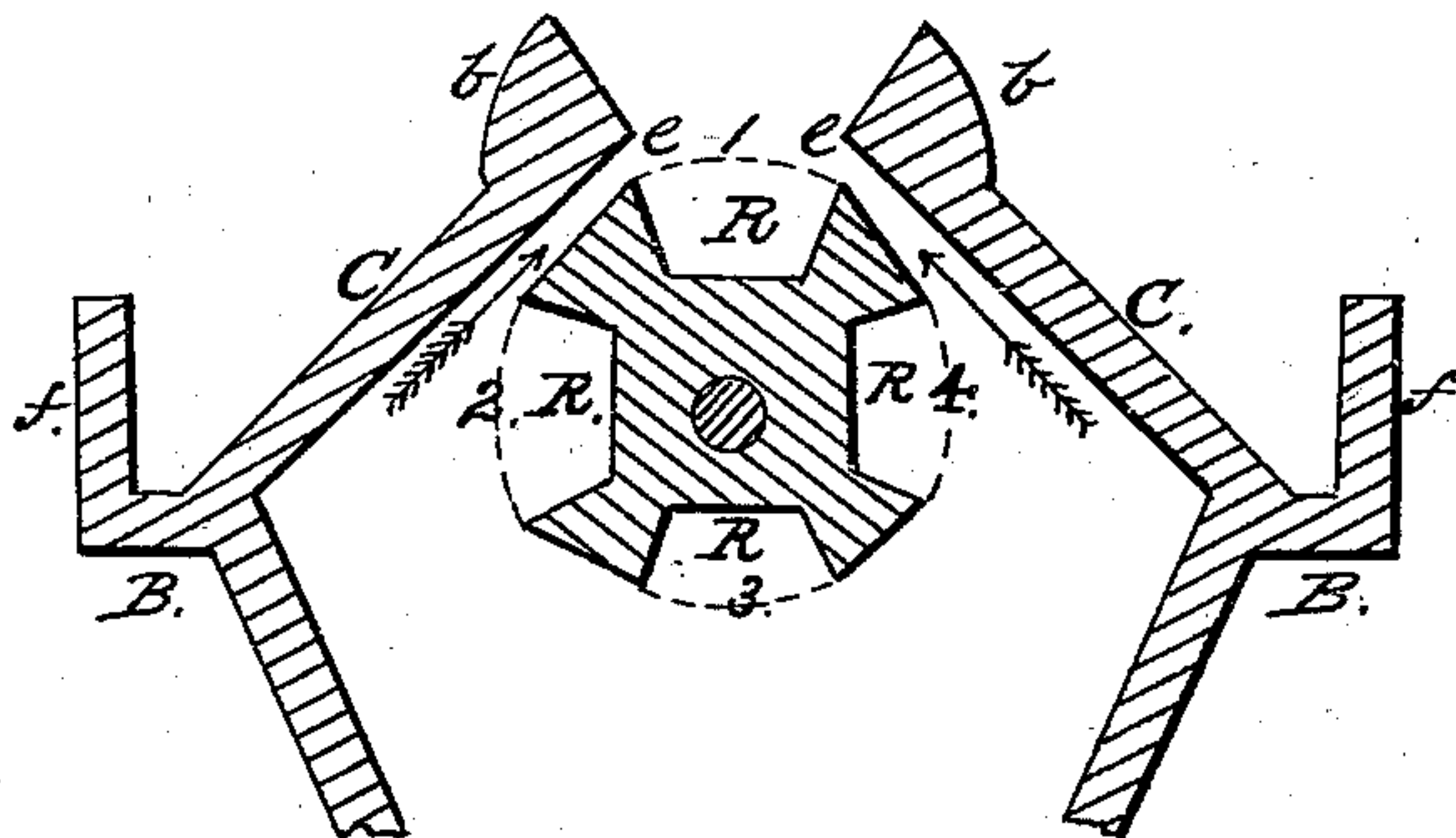
*N<sup>o</sup> 69,973-*

*Patented Oct. 22, 1867.*

*Fig. 1.*



*Fig. 2.*



*Witnesses:*  
*Thomas Brumby*  
*Isaac, D. Flanagan*

*Inventor:*  
*John W. Crannell*



# United States Patent Office.

JOHN W. CRANNELL, OF YORKVILLE, MICHIGAN.

*Letters Patent No. 69,973, dated October 22, 1867.*

## IMPROVED TUYERE.

*The Schedule referred to in these Letters Patent and making part of the same.*

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, JOHN W. CRANNELL, of Yorkville, in the county of Kalamazoo, and State of Michigan, have invented a new and useful improvement in Tuyeres for blacksmiths' forges; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the annexed drawing, making a part of this specification, in which—

Figures 1 and 2 are broken sectional views, at a right angle with each other.

Similar letters of reference indicate corresponding parts in both figures.

My invention has special reference to a peculiar arrangement for adjustment, by which some definite number of changes may be made in the area of the openings, through which the wind issues to the fire, besides operating in a manner to collect and clear away small clinkers and ashes, which collect and obstruct said wind-passages; and the better to enable others skilled in this branch of mechanism to construct my invention, I will now proceed to describe it.

A represents two sides of a wind-chest, open on top, into which the wind is forced by the bellows or fan, through a nozzle inserted usually at or about the point *a*. This chest is commonly made of a square form, tapering downward, and is flanged, as at B, to rest upon the masonry M of the forge, in which an open space, D, for an ash-pit, is formed immediately underneath. Two sides of the cap are exhibited at C. It is placed over the wind-chest in the form of a hollow truncated pyramid, with a square opening on top, beaded, as at *b*, to resist the action of the fire. The four inner sides of this cap form the outer boundaries of the narrow wind-passages, of which two are seen at *e*. To form the inner walls of the wind-sheets, in a manner susceptible of easy change of area space, to suit the nature of the work to be done, I employ what I term an "irregular recessed cylinder," E, which is keyed on a shaft, S; said shaft being hung in bearings formed in ears or flanges *f* on the wind-chest, and extending, at one end, through the masonry in front of the forge, where it is generally furnished with a crank-arm, *i*, and gauge-plate, *n*, having a series of holes arranged concentrically, by the means of which the irregular cylinder may be turned partially around and secured at some other desired position. Tapering recesses, indicated at R, of a size and form to correspond with the opening in the cap C, are sunken within the periphery of the cylinder, the outer corners of two sides of said recesses being determined by circular arcs, of different radius, struck from the centre of rotation, as may be clearly seen by the dotted lines at 1, 2, 3, and 4. To facilitate the removal of the cap, and help to steady it in place, I usually slot two sides of the cap to permit it to pass over the shaft.

The cap is sunk in the usual material of which the forge-hearth is constructed, and anything having a tendency to choke up the wind-passages will, on stirring the fire, naturally fall into one of the cups or recesses R, and will be emptied (on drawing back the slide *j*) into the ash-pit below, when the irregular cylinder is turned for that purpose, or for the purpose of changing the size of the wind-passages, by moving another recess under the opening in the cap. If desired, the wind-chest cap may be a hollow truncated cone, in which case, as the opening would be circular, the centre of the cylinder would be spherical, to conform, subject, however, to the same irregular formation of surface, in connection, perhaps, with some shaping of the interior of the cap, so that to whatever station the eccentric spherical cylinder may be set, the intervening wind-space between it and the cap, whether straight or curved, may be equal and parallel all round.

I disclaim the arrangement of the wind-chest and its cap; but what I do claim, and desire to secure by Letters Patent, is this:

I claim the arrangement and combination of the irregular recessed cylinder E and shaft S with the wind-chest A and cap C, substantially in the manner and for the uses herein described.

JOHN W. CRANNELL.

Witnesses:

HENRY W. MARTIN,  
D. L. JOHNSON.