R. Cook,

Rotary Blower,

No. 7,283. Patented Apr. 16, 1850.

Fig: 1.

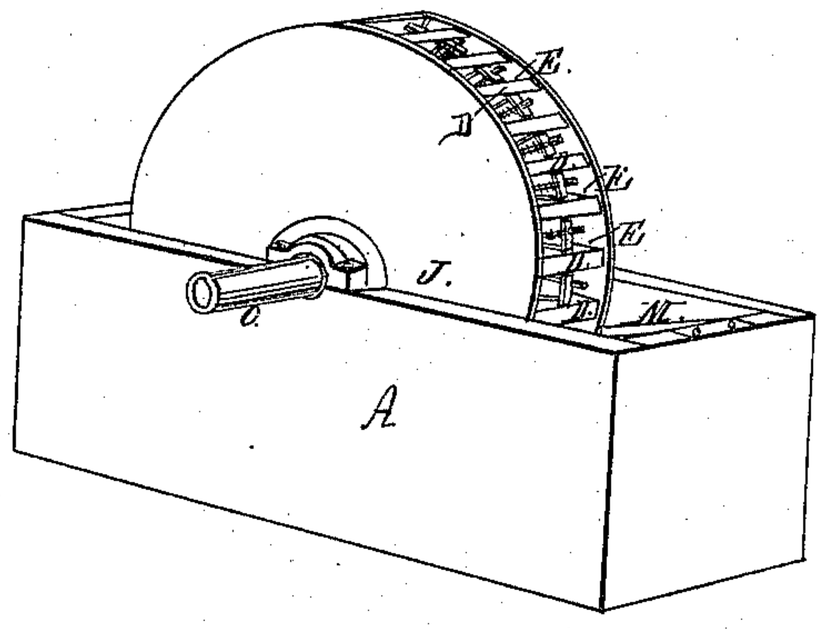


Fig: 2.

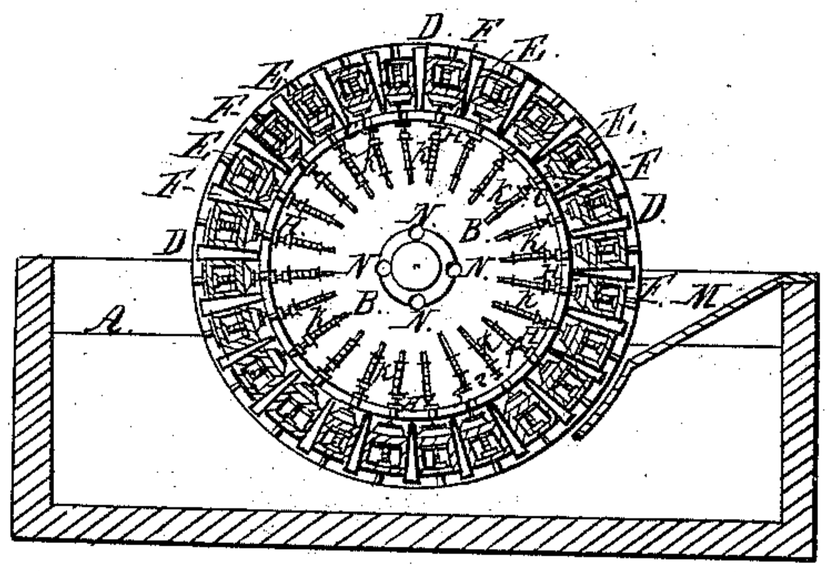


Fig: 3.

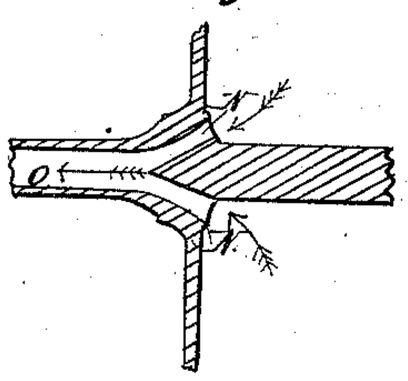
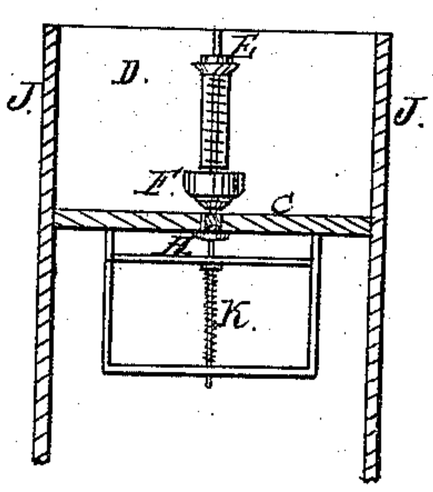


Fig: 4.



UNITED STATES PATENT OFFICE.

RANSOM COOK, OF SARATOGA SPRINGS, NEW YORK.

HYDRAULIC BLOWER FOR FURNACES, &c.

Specification of Letters Patent No. 7,283, dated April 16, 1850.

To all whom it may concern:

Be it known that I, RANSOM COOK, of Saratoga Springs, county of Saratoga, and State of New York, have invented a new and useful machine for producing a blast of air for smelting, heating, and other mechanical and manufacturing purposes, which I call a "hydrostatic blowing wheel;" and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, as making a part of this specification.

Figure 1, is a perspective view of the wheel and cistern, in which A represents the cistern or flume; J one side of the wheel or head of the drum; O the shaft; M the apron; D D D D partitions between the air cells; E E E exterior valves.

Fig. 2, is a sectional view of the wheel and its parts as suspended in the cistern and in use. N N N N are apertures which terminate in the hollow of the shaft; B B the reservoir or receiver of compressed air; H H H interior valves; K K K spiral springs on the stems of the valves; C C C the hoop or bond forming the face or periphery of the drum or receiver; F F F are floats near the heads of the exterior valves.

Fig. 3, is a sectional view of the shaft and of one of the ends of the receiver, the arrows indicating the direction of the air through the shaft as it leaves the receiver.

Fig. 4, is a sectional view of the valves, parts of the receiver and partition between the air cells.

To construct this blowing wheel the shaft is made hollow at one end, through which the air or blast is discharged from the wheel. This hollow in the shaft has branch openings within the drum or receiver as shown in Fig. 3, and at N N N N Fig. 2. The shaft should be made of iron. The sides of the wheel may be made of wood or iron, but should be air tight. They are secured to the shaft at such distance from each other. as may be necessary to give such capacity to the air cells as will furnish the necessary quantity of air required by the builder in his blast. A circular hoop or band C C C Fig. 2, which may be made of wood or metal and should be about one fourth less in diameter than the sides of the wheel and placed at a uniform distance within the periphery of the sides of the wheel, or in other words not eccentric to them. This hoop or band extends the whole distance between the two sides of the wheel and is secured to them with air tight joints; thus forming the face or periphery of a drum of which the sides of the wheel are its heads or ends. This drum is the receiver of the compressed air for the blast and must therefore be securely fastened together so as to resist the internal pressure to which it is exposed.

Partitions D D D, resembling the paddles to a steamboat paddle wheel are then inserted at suitable intervals from each other, between the two ends of the wheel; the edges of these partitions being in air tight contact with the periphery of the drum or recevier. The spaces between these partitons are called air cells and in each of these air cells a hole is made through the periphery of the receiver and countersunk on each side so as to form seats for the valves. The exterior valves E E E, having feeble spiral springs on their stems to hold them open, and floats near their heads to close them, are then secured in the air cells opposite the holes in the periphery of the drum. Within the receiver the interior valves H H H, are also placed opposite the holes which communicate with the air cells, which valves are held to their seats by feeble spiral spring.

The floats on the exterior valves may be made of cork, hollow metal or other material care being taken to give them such buoyancy that when immersed in water they will overcome the tension of the springs on their stems. The spiral springs I make of brass wire as well adapted to resist the oxygen of the water, and for the same reason the valve stems should be made of brass or copper rods.

The wheel being finished is suspended within a flume, cistern or circular trough, while the apron M, is held in gentle contact with the periphery of the wheel.

To put this wheel in operation, water is let into the flume or cistern until nearly one third of the diameter of the wheel is immersed. Where water power is abundant paddles or buckets may be placed on the blowing wheel and a current of about four miles an hour given to the water in which it is suspended, thus turning the wheel and producing the blast. But where economy of power is desired, the wheel may be suspended in a cistern or, what is still better, a circular trough and then slowly turned by steam or any other power. The air cells

enter the water in contact with the apron M, which is intended to exclude the water until the whole mouth of the air cell is immersed and thus prevent a loss of air. The pressure of the air in the cells increasing as they descend in the water eventually forces open the interior valves and thus enters the drum or receiver as shown at 1, 2, 3, Fig. 2. The interior valves when not forced open to receive air, serve by closing to prevent its escape through the same apertures by which it entered. As the ascending water forces the air from the cells into the receiver, it surrounds and embraces the floats F F F, and thus presses the valves to their seats by overcoming the tension of the spiral springs upon their stems which have previously held them open. This seasonable closing of the exterior valves prevents the entrance of water into the receiver. As the air cells successively emerge from the water, the valve floats being no longer acted upon by the water the springs upon the valve stems again throw them open. The wind in the receiver enters the shaft through the apertures N N N N, Fig. 2, and is discharged into a chest at the end of the shaft by means of a stuffing box—from this chest it is conveyed wherever wanted for use.

The strength of the blast is to be determined by the depth to which the air cells are plunged in the water, and the diameter of the receiver should be at least three times such depth of immersion.

What I claim as my invention and which I desire to secure by Letters Patent, is:

The combination of the cavities or air cells, formed in part by the partitions D D D, on the periphery of the drum of the wheel or receiver of compressed air B B, with said drum or receiver B B, the exterior floating valves E E E, the interior valves H H H, and the hollow shaft O; all forming parts of, or connected with a wheel, to be turned when partially immersed in water, for the purpose of producing a blast of air through the hollow shaft O, to be used in heating, smelting and other manufacturing and mechanical operations.

RANSOM COOK.

Witnesses:
DANL. SNYDER,
W. B. B. WESCOTT.