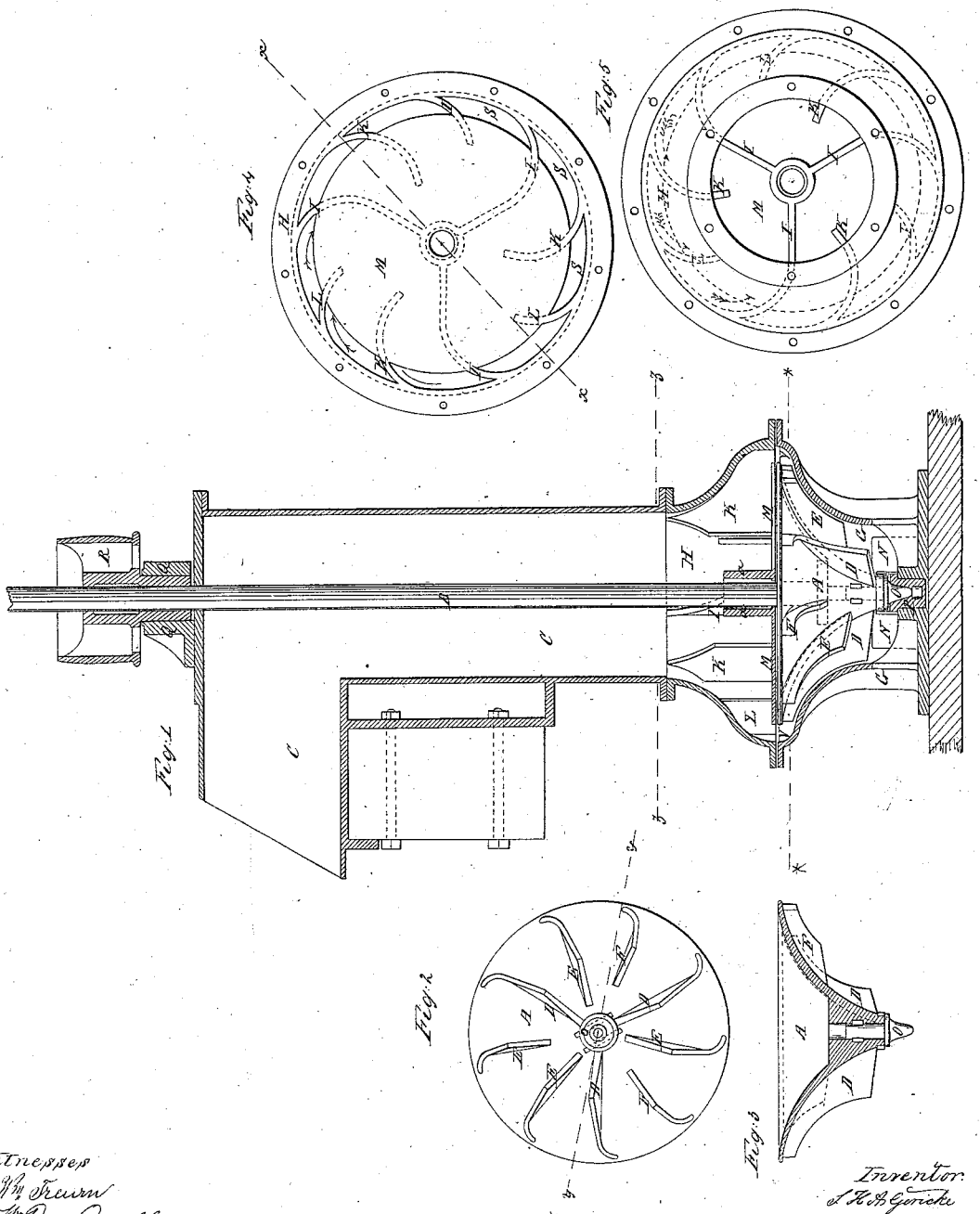
J. H. A. Gericke,

Centrifugal Pump,

No. 55,082. Patented May 29, 1866.



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J. H. A. GERICKE, OF NEW ORLEANS, LOUISIANA.

IMPROVEMENT IN TURBINATE FORCE-PUMP.

Specification forming part of Letters Patent No. **55,082,** dated May 29, 1866.

To all whom it may concern:

Be it known that I, JOHN HARTMAN AUGUST GERICKE, of New Orleans, in the parish of Orleans and State of Louisiana, have invented a new and useful Improvement in Force-Pumps; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical section of a pump made according to my invention on the line *x* of Fig. 4. Fig. 2 is an under-side view of the rotating turbinate wheel A. Fig. 3 is a section of said turbinate wheel on the line *y* of Fig. 2. Fig. 4 is a bottom view of the centripetal chamber H, taken on the line *x* of Fig. 1, from beneath the bottom plate, M. Fig. 5 is a top view of said chamber H, taken from the line *z* of Fig. 1.

Similar letters of reference indicate like parts.

This invention consists in a force-pump operating on the principle of a turbine wheel, and designed for raising great bodies of water in short periods of time, as when draining low lands, pumping water out of ships and out of mines and other low places.

A designates a turbinate wheel consisting of a hollow truncated cone inverted, with vanes or paddles D, E, and F. The wheel is fastened upon the vertical shaft B, whose foot or point O is stepped in a pillow-block, P, on which it turns. The foot or point O is made removable, as is also the block P, and they will be oiled from a small pipe, (not shown,) which may extend through the shaft. The top of the shaft B is properly connected to the upper side of the discharge-pipe C, so as to be capable of longitudinal motion through it as well as rotary motion, by which means the length of the discharge-pipe may be changed without disturbing the working parts of the pump. The vane of the bevel wheel or pulley R is lengthened out below, so as to turn in a pillow-block or bearing, Q, fixed on the top of the pipe C. The vanes or paddles on the turbinate wheel are made in three systems—that is to say, three of them, D, extend from its circumference quite to the apex or end of the wheel *j*, three of them extend from the circumference about two-thirds the length of the wheel, and the remaining three extend from the circumference about half its length. Their shapes are seen in Figs. 1, 2, and 3, their lower ends extending radially from the wheel, and being cut in horizontal planes, and their upper ends being bent to tangential lines on the rim of the wheel. The long paddles take the water first near the center of the shaft and move it outward toward the circumference of the wheel. Next after them the paddles E, and then the paddles F, take the water and elevate it by driving it against the sides of the inclosing-case G, whose lower side should be submerged in the water. That portion of the water which runs over the edges of the vanes D is encountered by the vanes E and F in succession, and receives a new impulse from each toward the space V at the top of the case G. The base of the case G has six openings, N, more or less, in its periphery, through which to admit the water to the turbinate wheel, and it rests on a bed-plate which has a circular collar that receives the pillow-block P. This part of the case has straight sides, but it begins to be curved at the line of the top of the opening N, and runs thence upward and outward at a uniform distance from the edges of the vanes to the height of the wheel, where a rim is formed on it which receives the rim of an upper case, H, of similar form, set conversely to the case G. The lower part of the case, about its openings, is surrounded by a paling of wire-gauze or its equivalent, for the purpose of excluding the access to the vanes of solid and foreign substances, which might injure them. The case H rests on a plate, M, fixed to it, and which surrounds the shaft B with its hub *a*. The circumference of the plate is about coincident with that of the highest part of the turbinate wheel, so that its periphery does not extend into the annular space V. The case H is provided with fixed vanes of the like general character as the vanes of the turbinate wheel. The long vanes I extend from the hub *a* of the bottom of the case to the side of the case H, the other vanes, K and L, being shorter, not extending to the hub, but distant therefrom by varying degrees, and yet being joined to the sides of said case H. These vanes, therefore, I, K, and L, severally project over the annular space V and divide the stream

of water which rises through it into an equal number of branches, which are deflected by them toward the center of the case, as indicated by the arrows, while they proceed through the cells made by said vanes. The rotary motion imparted to the water by the turbinate wheel is gradually lost as it proceeds toward the center of the case H, and it becomes quiet and motionless therein, while it is gradually lifted by the pressure of the currents from below into the discharge-pipe C. The provision of the fixed bottom M of the case H keeps the weight of the water off from the turbinate wheel, as well as the friction of the water after it has passed through the annular space V.

It will be observed of the operation of my pump that the water will be seized by the paddles of the quick turbinate wheel, and by virtue of the centrifugal force exerted, the water will mount obliquely to the case H and be thrown into the cells thereof, along whose walls—that is, the vanes I, K, and L—it will run toward the center of the case. The curves of these vanes, as well as of the vanes D, E, and F, are to be those of least resistance, so that the least friction possible will be produced in those operations.

All the parts of the pump may be of cast-iron, except the shaft B, which should be of wrought-iron.

I claim as new and desire to secure by Letters Patent—

1. A turbinate wheel inclosed, as shown, with three systems of vanes or paddles D E F, substantially as described.

2. The fixed case H over the turbinate wheel or engine which drives the water upward, fitted with three different systems of curved vanes to direct the water toward the center of the said case, substantially as described.

3. Separating the column of water in the case H and above it from the turbinate wheel above-described by means of a fixed plate, M, substantially as described.

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Witnesses:

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