

2. Sheets. Sheet. 1.

W. Snyder,
Hydraulic Engine.

No. 110,796.

Patented Jan. 3. 1871.

Fig. 1.

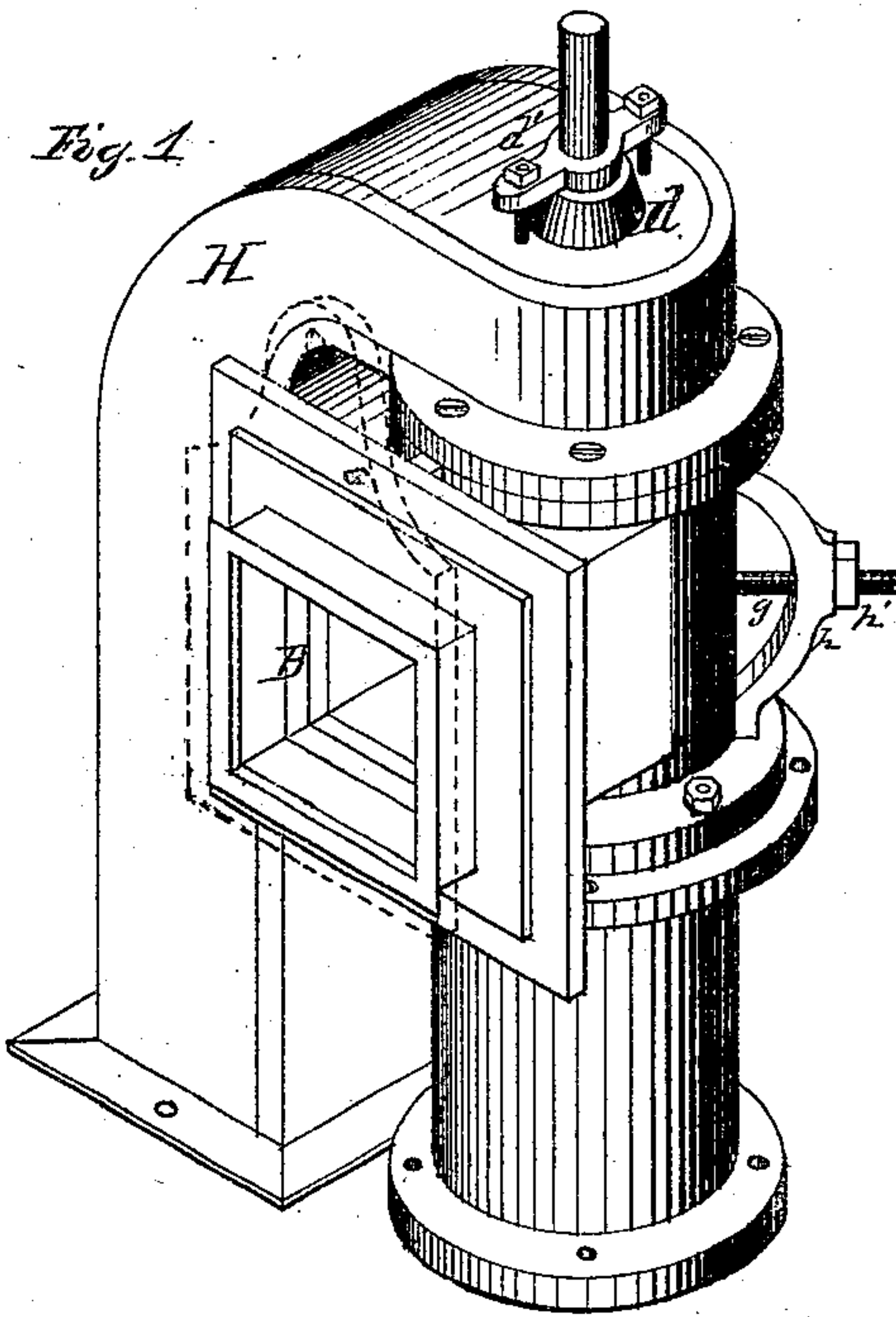
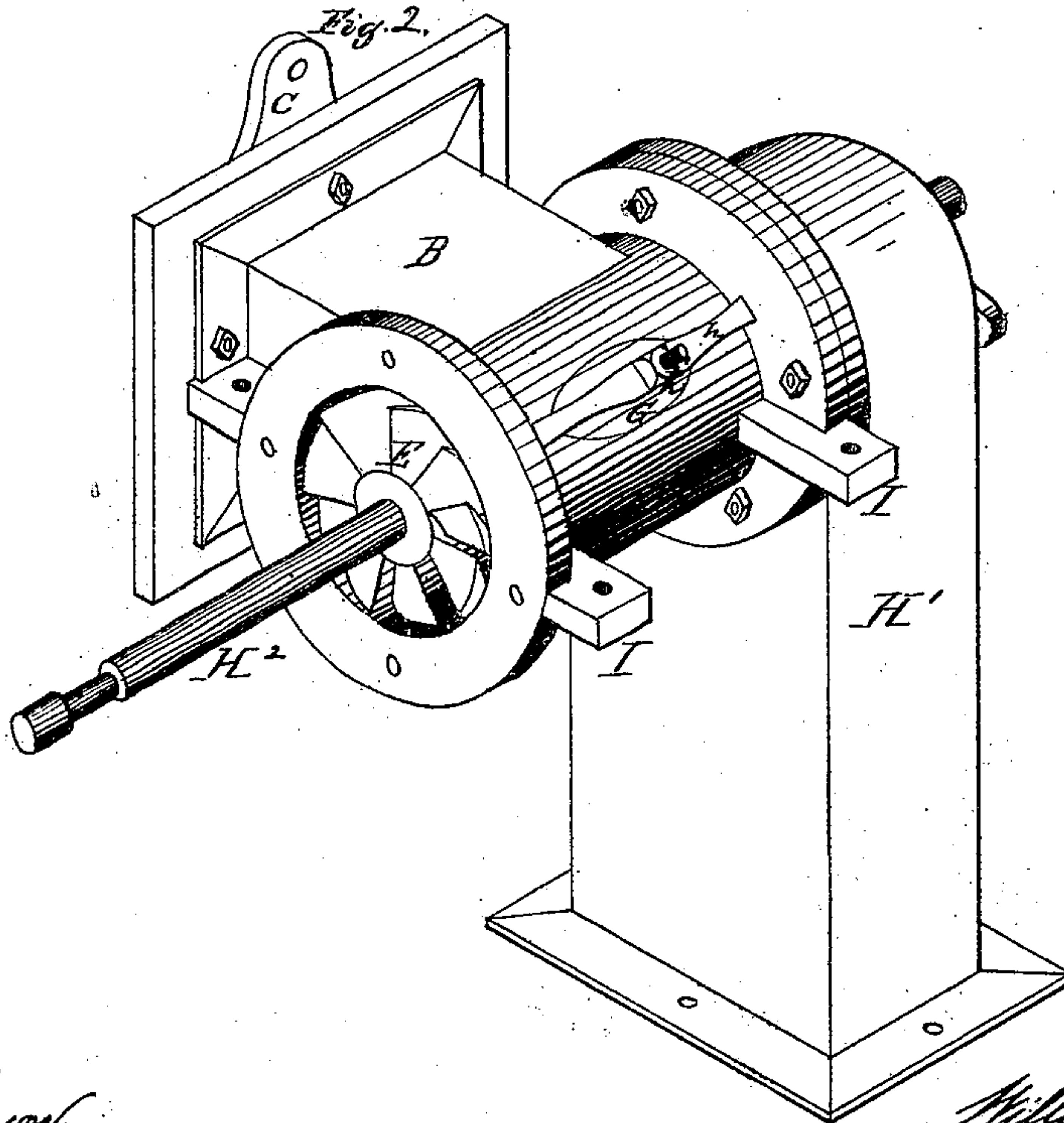


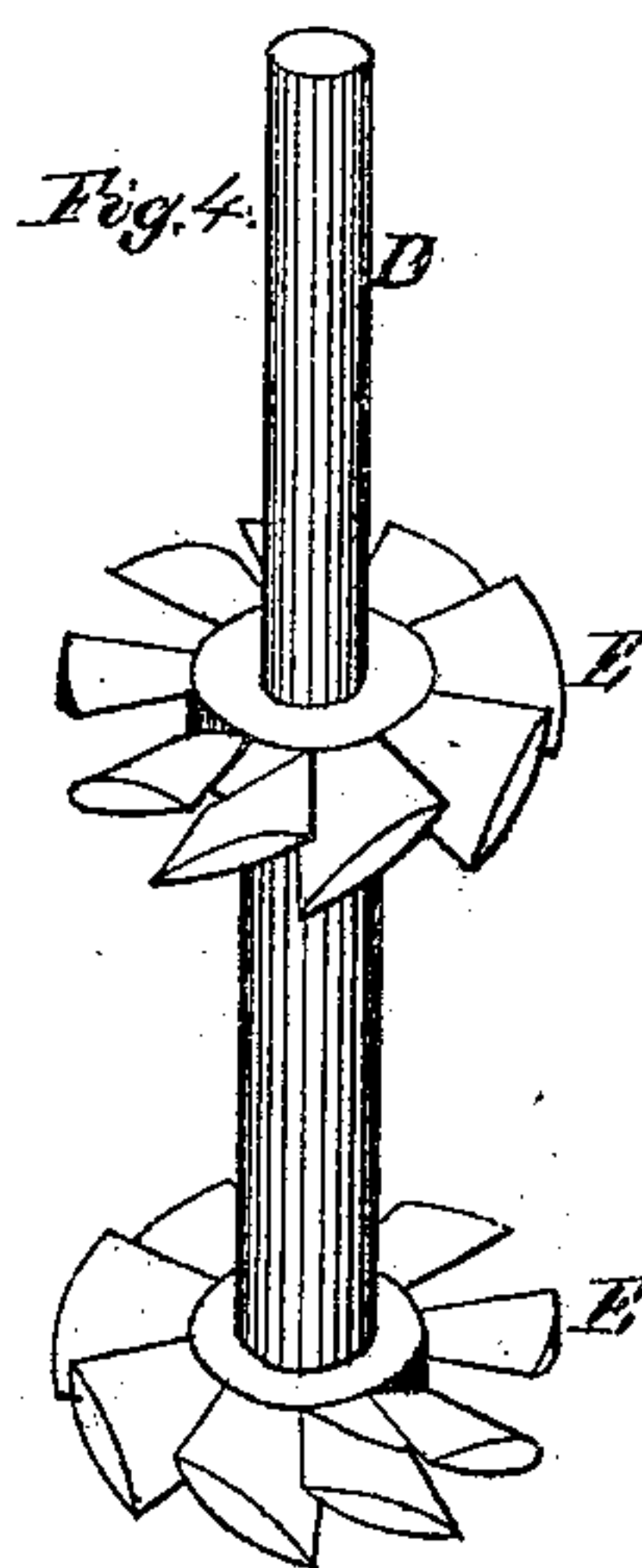
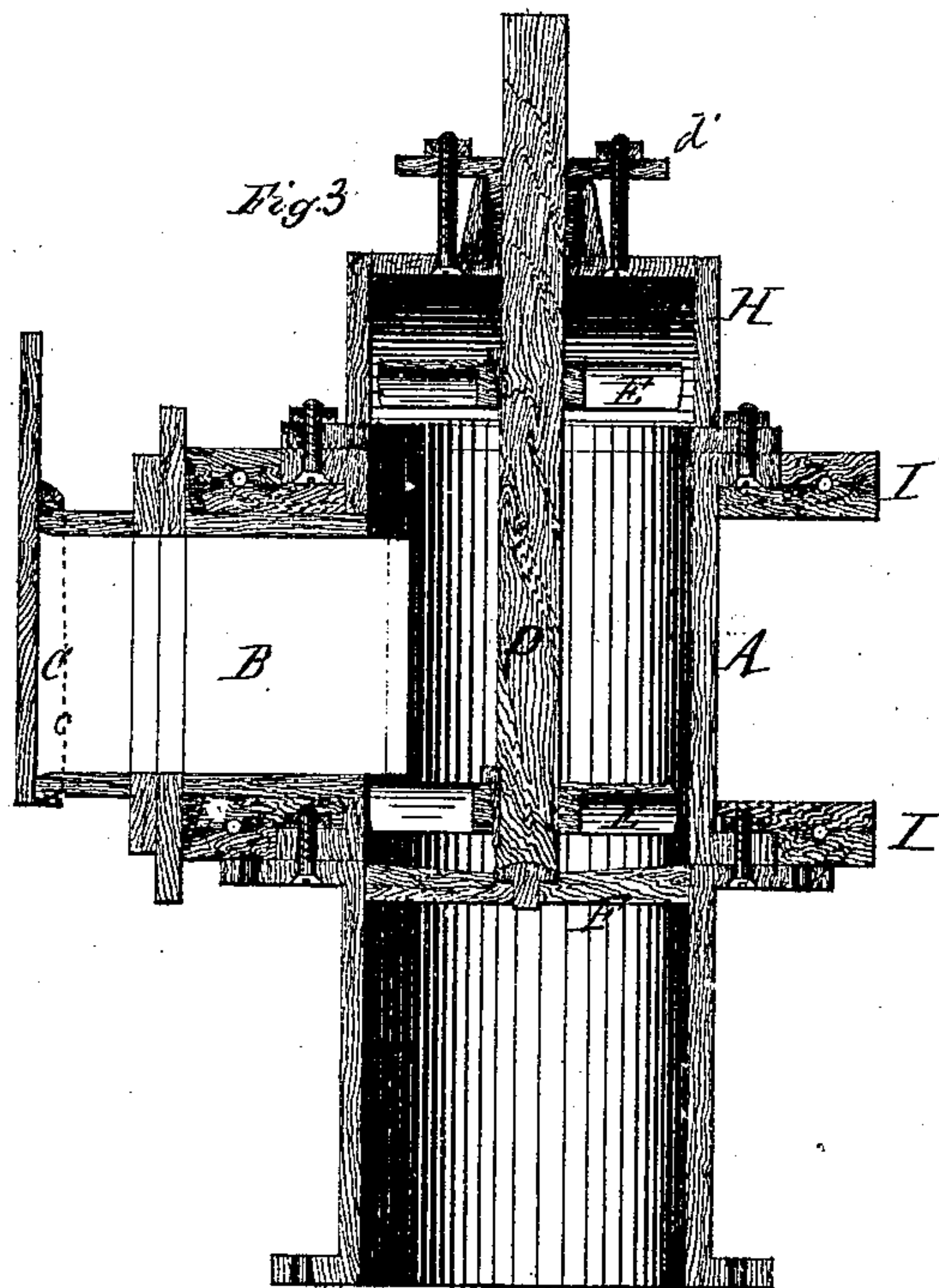
Fig. 2.



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WILLIAM SNYDER, OF BULLSKIN TOWNSHIP, PENNSYLVANIA.

Letters Patent No. 110,796, dated January 3, 1871.

IMPROVEMENT IN HYDRAULIC ENGINES.

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, WILLIAM SNYDER, of Bullskin township, in the county of Fayette and State of Pennsylvania, have invented a new and valuable Improvement in Hydraulic Engines; 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 drawing making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawing is a representation of engine in perspective, arranged for vertical operation.

Figure 2 is a perspective view of engine, arranged for horizontal operation.

Figure 3 is a vertical section of fig. 1.

Figure 4 is a perspective view of vertical shaft and wheels.

My invention relates to the general improved construction and arrangement of hydraulic engines in their application for the purpose of operating mills and machinery through the motive power of water, the percussive force being received on properly-constructed wheels, which thereby revolve and transmit motion by means of suitable gearing or connections.

The device forming the subject matter of the present invention is designed to operate with the axis of motion of the wheels, either horizontal or vertical.

Figs. 1 and 3 in the drawing represent clearly and correctly the arrangement of the engine for vertical operation, the different parts being, in general construction, the same as for horizontal arrangement.

A represents a cylinder of proper proportions, provided with a forebay, B, of ordinary construction, for the entrance of water, and capable of ready attachment to sluice-outlets.

C represents the bay-gate sliding vertically.

D shows the vertical wheel-shaft, to which are keyed the wheels E, one above and one below the bay B, with their vanes inclined toward the opening thereof.

F is a seat for the lower end of the shaft to turn on, formed of two cross-bars rigidly fixed within the cylinder below the forebay.

G is an oval plate covering a man-hole in the cylinder near the forebay.

This plate is secured in place by the screw-rod *g*, which passes through the curved bar *h*, and held by a nut, *h'*.

The purpose of the man-hole is to allow of the easy

removal of obstructions accumulating between the wheels.

H represents an outlet-sluice connected by bolts with the flanged rim on the upper end of the cylinder, and thence taking a vertical descent, as shown in fig. 1.

After impinging on the wheels, the water passes off through the sluice H and lower end of the cylinder.

The vertical shaft D passes through a box, *d*, formed in top of the sluice H, and is geared or properly connected with such machinery as it is designed to operate.

d' represents a bushing, secured in place by bolts and screws, the latter being inserted in the sluice-timbers.

I represents the timbers by which the engine may be secured by bolts to its foundation.

Fig. 4 illustrates the mode of arrangement of the engine for obtaining horizontal motion.

For this purpose the section of the cylinder containing the seat of the vertical shaft is removed, as also is the sluice H.

A straight sluice, *H*¹, is substituted for the latter, and one similar thereto attached to the other end of the cylinder.

A longer shaft, *H*², with gudgeons at both or one end only, is substituted for the vertical shaft. The engine is then properly arranged.

The water enters the forebay and passes off through the vertical sluices or boxes *H*¹.

The gate C of the fore-bay is provided with cleats *c c*, by means of which it is arranged to slide on the square frame which surrounds the mouth of the forebay. The gate is reversible, and can, therefore, be used with either position of the casing.

Claim.

The hydraulic engine, having cylinders A, fore-bay B, man-hole covered by plate G, shaft D with wheels E, step F, and sluice H, constructed as described, and adjusted for operation as specified.

In testimony that I claim the above, I have hereunto subscribed my name in the presence of two witnesses.

Witnesses:

WILLIAM SNYDER.

I. LLOYD SHALLENBERGER,
HENRY JORDAN.