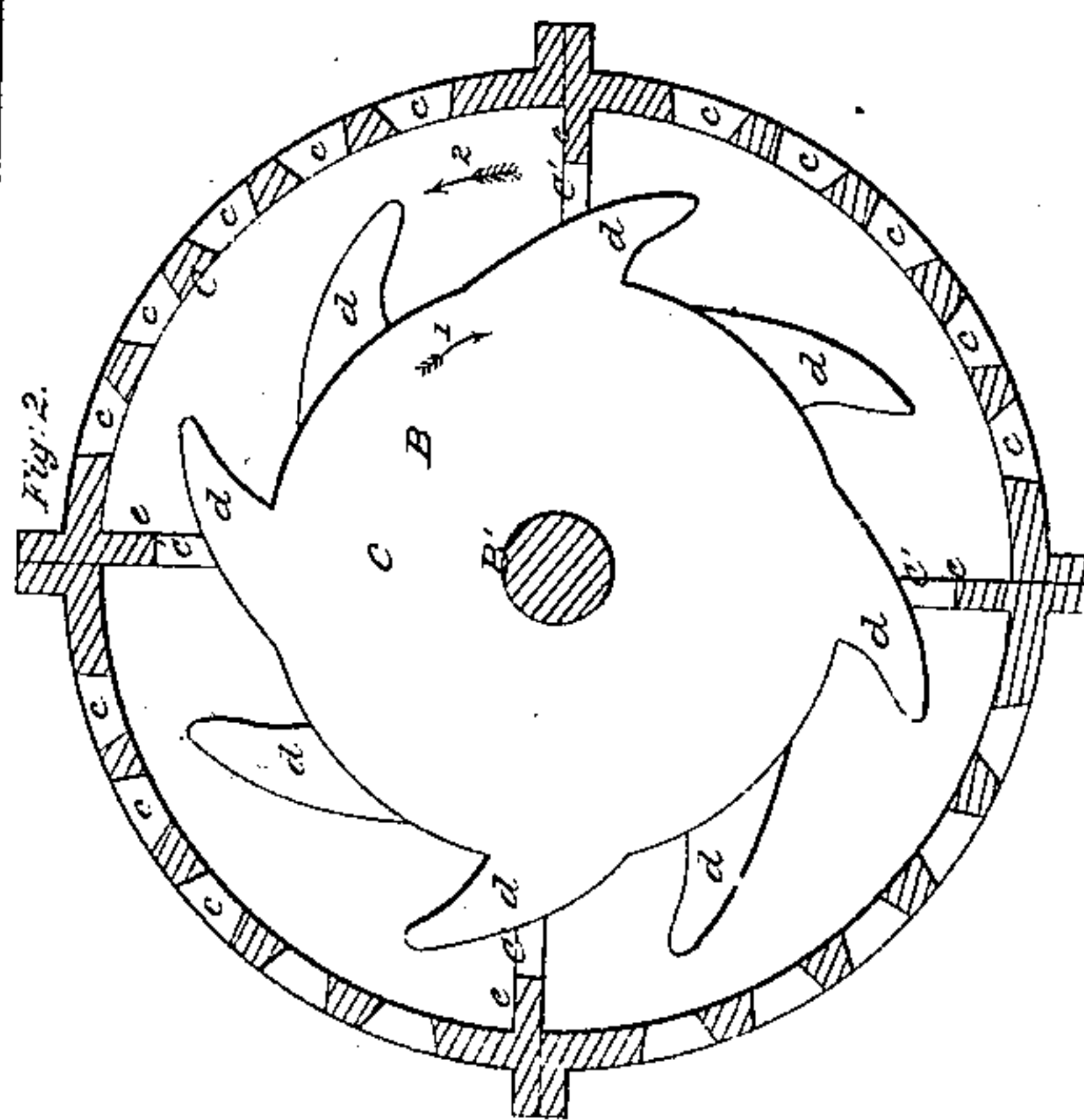
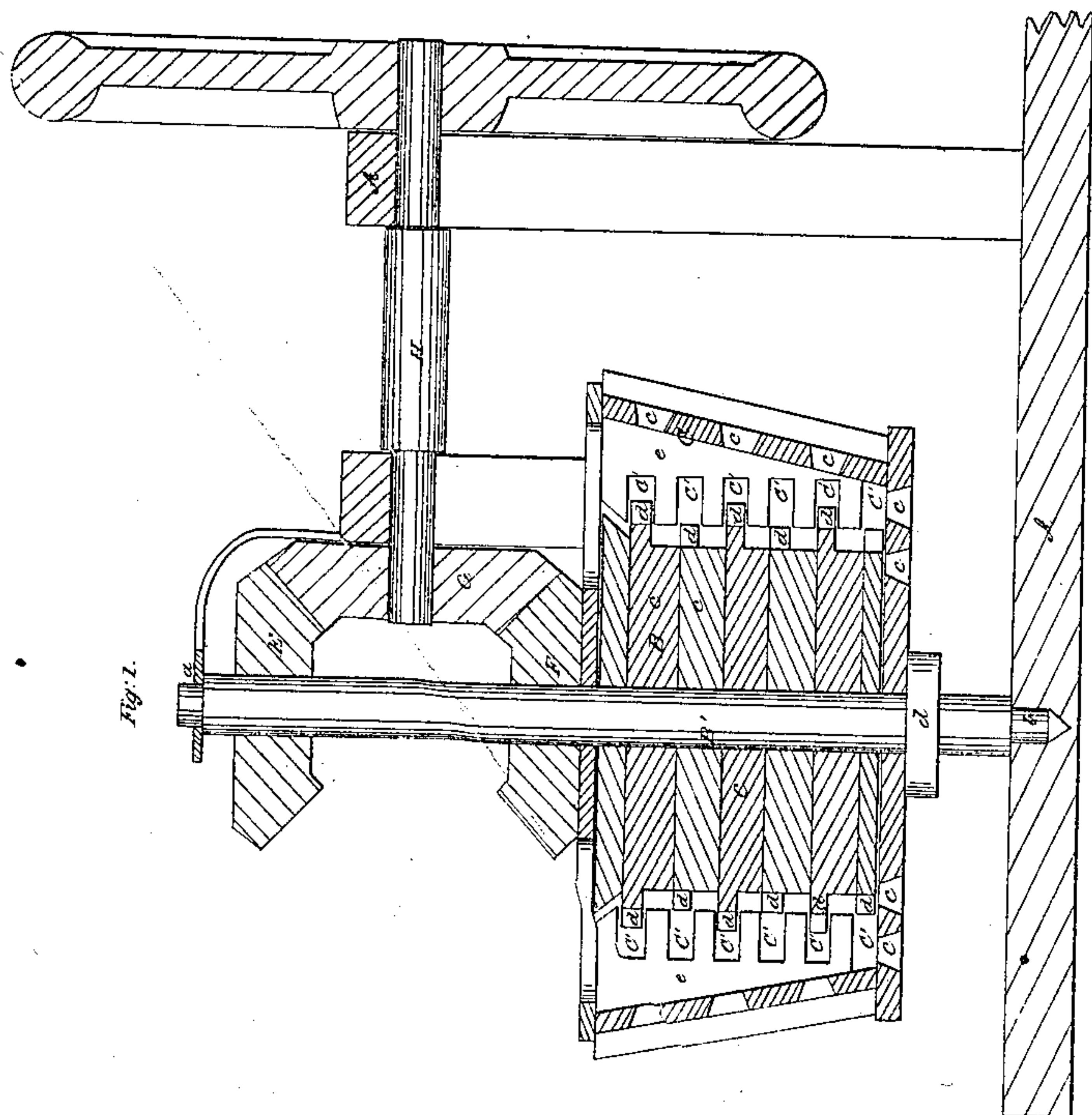
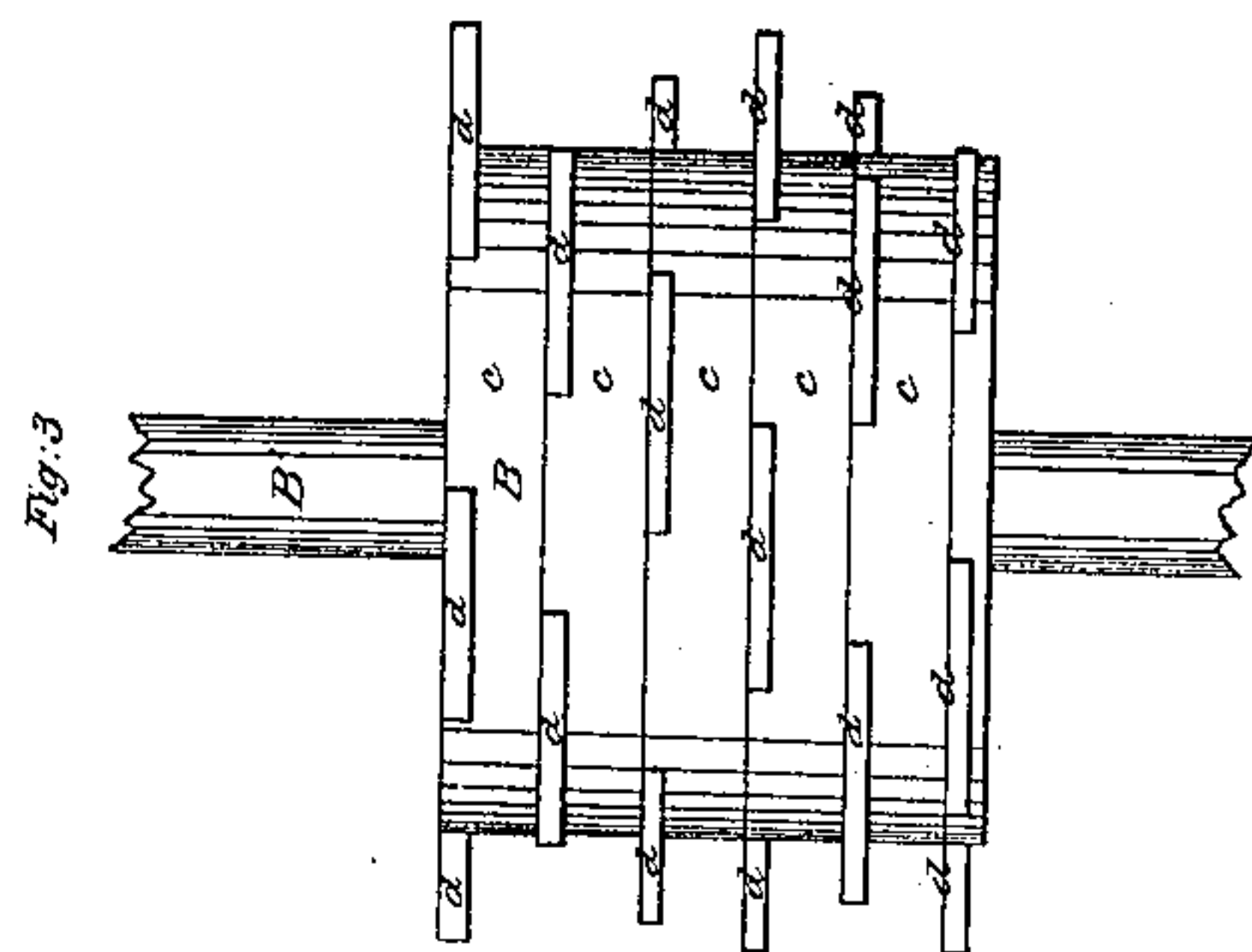
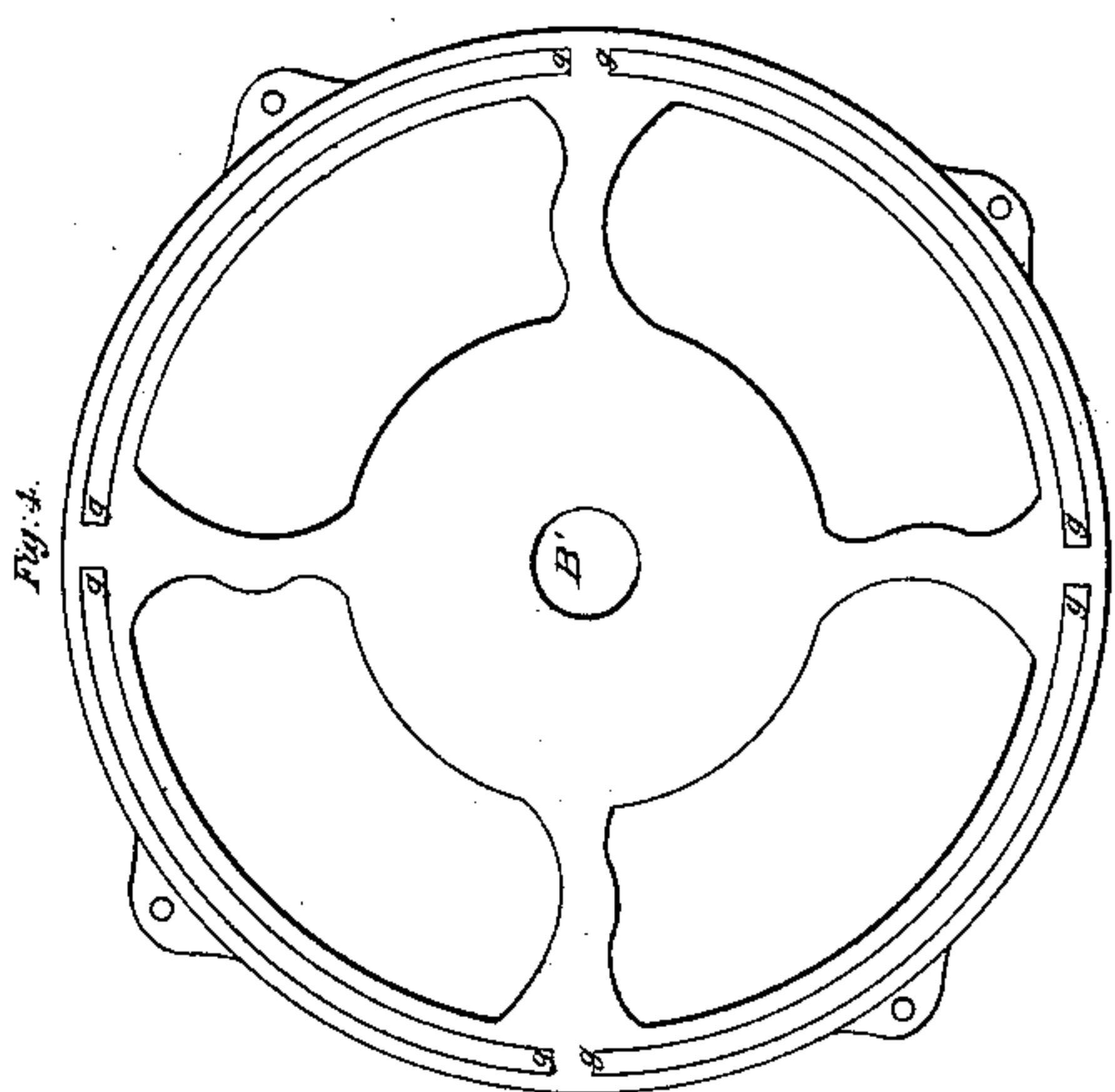


A. BOLTON.
COAL BREAKER.

No. 19,481.

Patented Mar. 2, 1858.



UNITED STATES PATENT OFFICE.

AQUILA BOLTON, OF PORT CARBON, PENNSYLVANIA.

MACHINE FOR BREAKING COAL.

Specification of Letters Patent No. 19,481, dated March 2, 1858.

To all whom it may concern:

Be it known that I, AQUILA BOLTON, of Port Carbon, in the county of Schuylkill and State of Pennsylvania, have invented a new and useful Improvement in Coal-Breakers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, is a vertical central section of a coal breaker constructed after my invention. Fig. 2, is a horizontal section of the same. Fig. 3, is a detached side view of the breaker shaft. Fig. 4, is a plan showing a modification of my invention.

Similar letters of reference in each of the several figures indicate corresponding parts.

The nature of my invention consists in breaking coal, and discharging it as fast as broken, by means of the combined action of a shaft or roller, armed with teeth or cutters, and revolving in one direction, and a perforated hollow conical chamber, furnished with vertical slotted ribs or partitions, and revolving in an opposite direction to that of the shaft or roller, as presently described.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A, represents a frame for supporting the machine.

B, is the central revolving breaker shaft or roller. It has its bearing at *a* and *b*. This shaft is formed of a series of ring plates *c, c*, which are armed in their peripheries with teeth or cutters *d, d*, that set tangentially. These ring plates are keyed on the axis *B'*, of the shaft or roller B, so as to have the teeth of one out of line with those of another and thus run from top to bottom of the roller in a spiral or screw line as shown in Fig. 3. This roller is to revolve in the direction of the arrow 1.

C, is the revolving hollow conical chamber surrounding the shaft or roller B, and fitting around and turning loosely at top and bottom on the axis *B'*, of said roller, being kept in place by means of a collar or shoulder *d*, formed on the axis below the bottom of the cylinder. This conical chamber has four or more vertical partitions *e e e e* projecting radially from its inner circumference to within a short distance of the

shaft or roller B. These partitions are furnished with open slots *C'*, so that the teeth of the cylinder may pass by or through them in their revolution in an opposite direction to that in which the cylinder is revolving, said cylinder being intended to revolve in the direction of the arrow 2. These ribs or partitions serve, in connection with the teeth or cutters of the shaft or roller, and the reverse motions of the same to break the coal without grinding or crushing it as will be presently shown. The periphery and bottom of the cylinder C, is perforated with openings *C', C', C'*, for the coal, as fast as broken, to escape through by reason of the centrifugal force and gravity. These perforations should be square and flaring outward as shown in the drawing, in order to facilitate the escape of the broken coal.

The chamber C, is made conical in order that the breaking operation shall continue from top to bottom, and in order that such coal as is broken or partially reduced in size by the first circle of teeth or cutters, but does not escape, shall be continuously acted upon in its descent until reduced to the proper degree of fineness and caused to discharge. The conical form of the chamber C, also insures the escape of the coal owing to its having all the time to pass over the escape passages.

The motions of the shaft and chamber are produced by means of bevel gearing E, F, G, which is disposed as follows. The bevel wheel E, is made fast on the axis of the roller or shaft B, and the bevel wheel F, fast to the top of the cylinder C, and the two gearing into the wheel G, which is arranged on the end of a driving shaft H, as shown.

In Fig. 4, a modification of the conical chamber is shown. In this view the sections or sides of the cylinder are made removable by being arranged to slide up and down as shown at *g, g, g, g*. This is desirable so that sections or sides with smaller or larger discharge openings may be employed, and the coal thus broken to answer the demands of the market.

From the foregoing description of parts, it may be evident, if the coal to be broken is fed into the hollow conical chamber and said chamber and shaft or roller in motion, that it will be gathered up by the teeth or cutters of the roller or shaft and forcibly

brought in contact with the ribs or partitions and broken, and as fast as broken instead of being pressed or forced through the slots of the partitions will be carried back
5 and around by the ribs or partitions until it discharges at the sides of the cylinder by centrifugal force, or at the bottom by gravity.

Having the coal after being simply broken
10 caught instantaneously by the partitions of the revolving cylinder and carried back from the cutters or teeth and discharged by centrifugal force instead of crushed by being forced by and through the partitions,
15 constitutes the gist of my invention.

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

The arrangement shown, consisting of the perforated, internally ribbed or toothed conical chamber C, *e*, C', *c'*, revolving in one 20 direction, and the toothed shaft or roller B, *d*, revolving in an opposite direction, for the purpose of breaking coal as specified.

The above specification of my improvement in coal breakers signed by me this 22nd 25 day of January, 1858.

AQUILA BOLTON.

Witnesses:

G. Y. AT LEE,
R. W. FENWICK.