

(No Model.)

S. C. SCHOFIELD.

GRINDING MILL.

No. 283,518.

Patented Aug. 21, 1883.

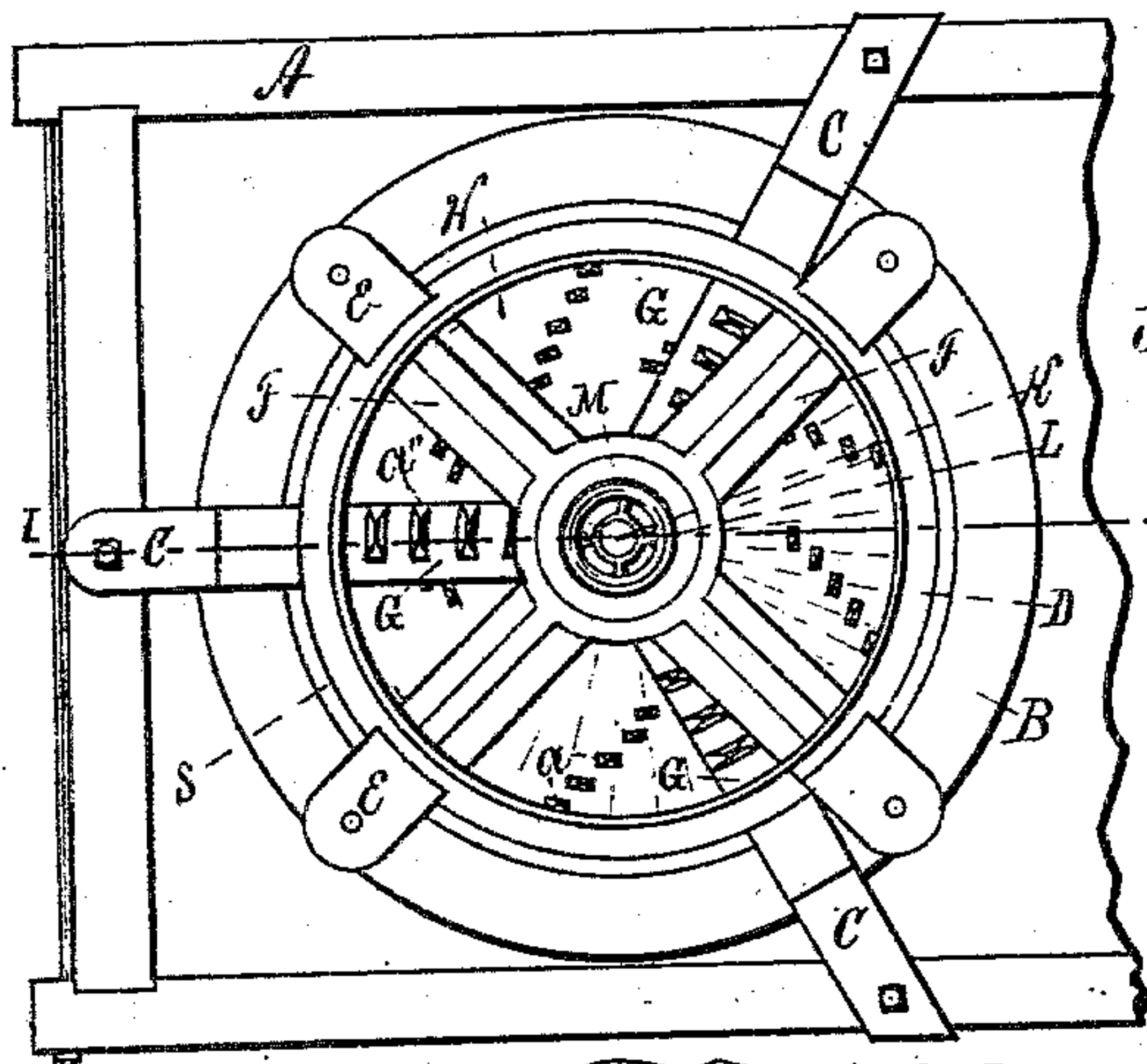


Fig. 1.

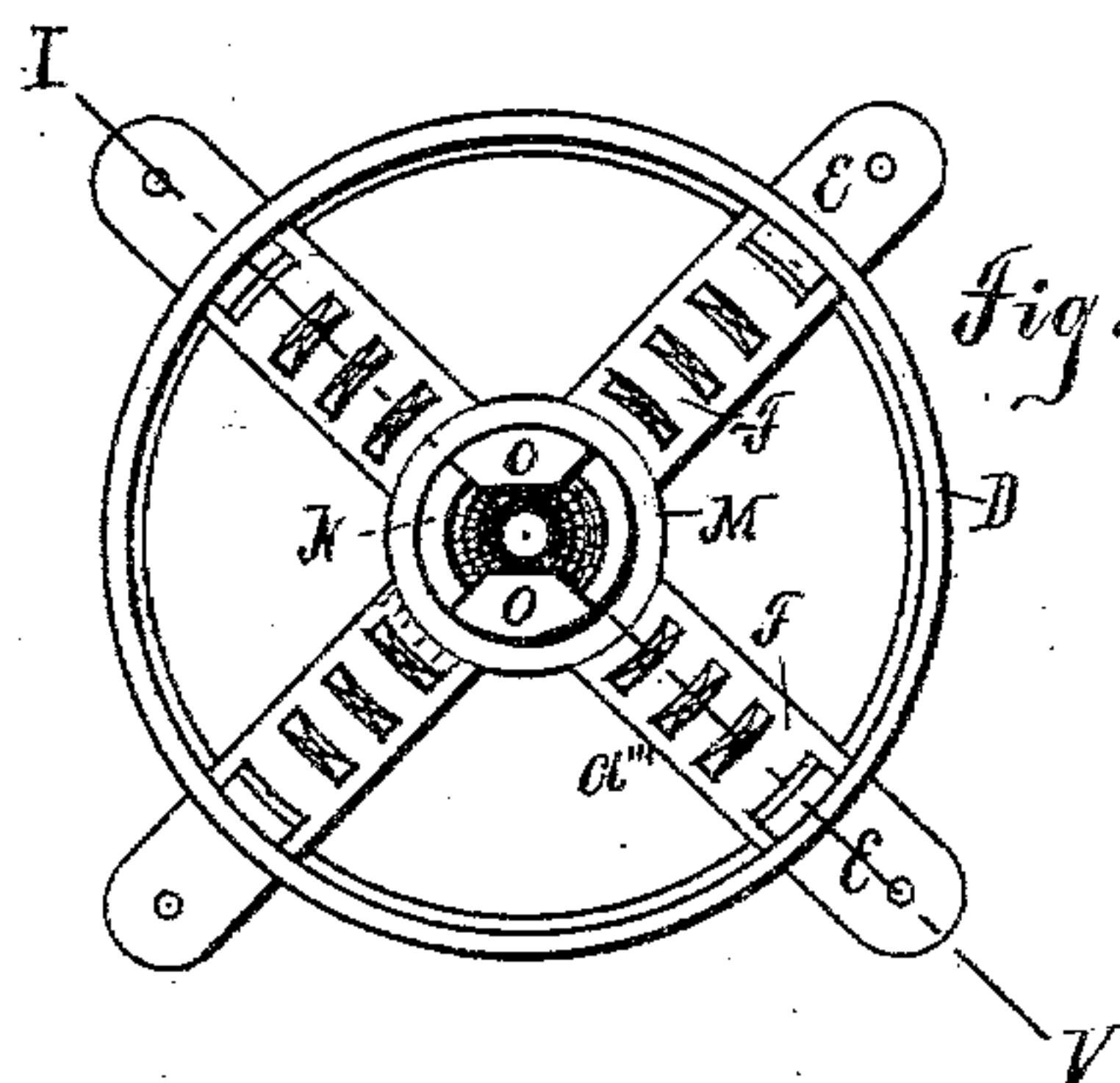


Fig. 2.

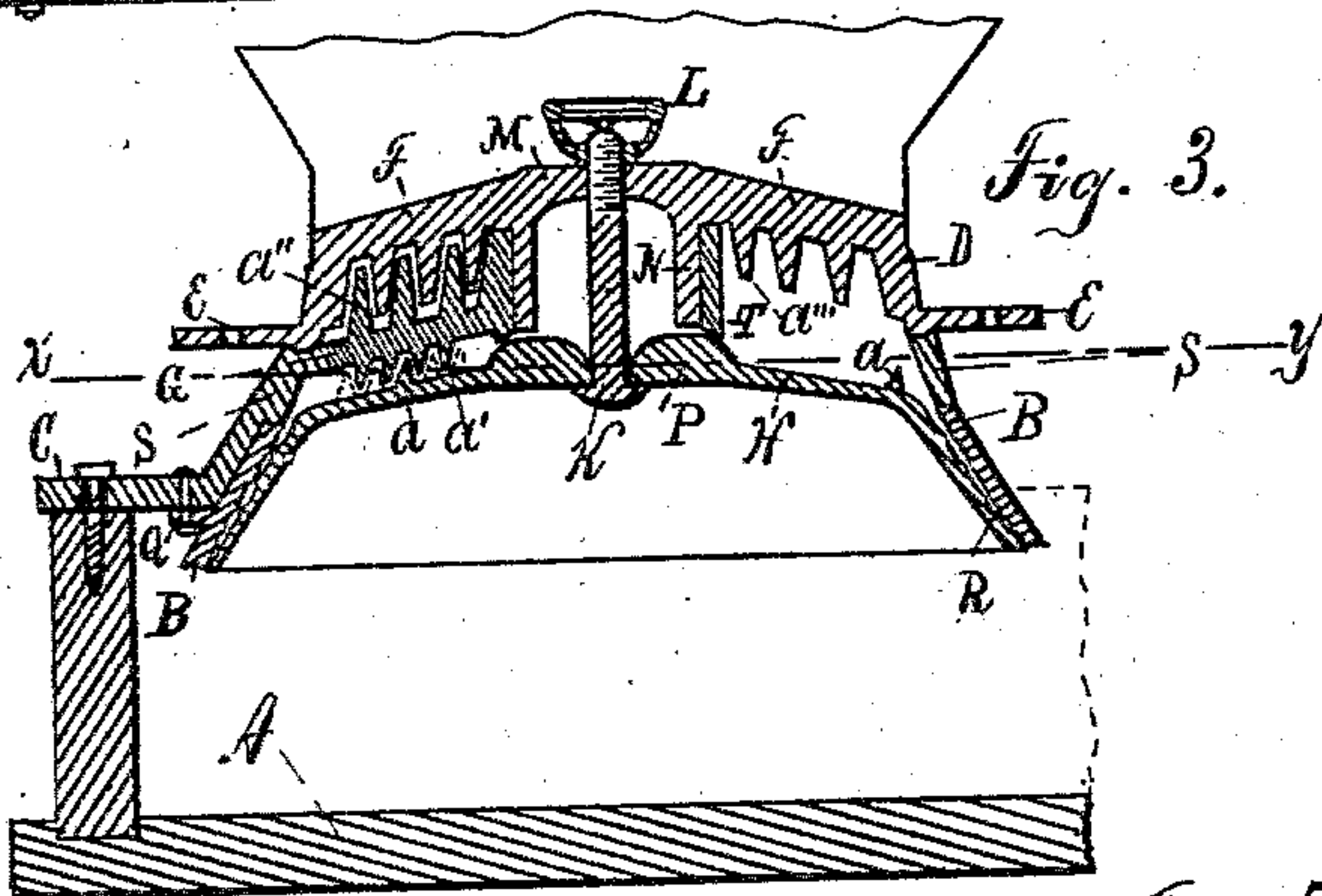


Fig. 3.

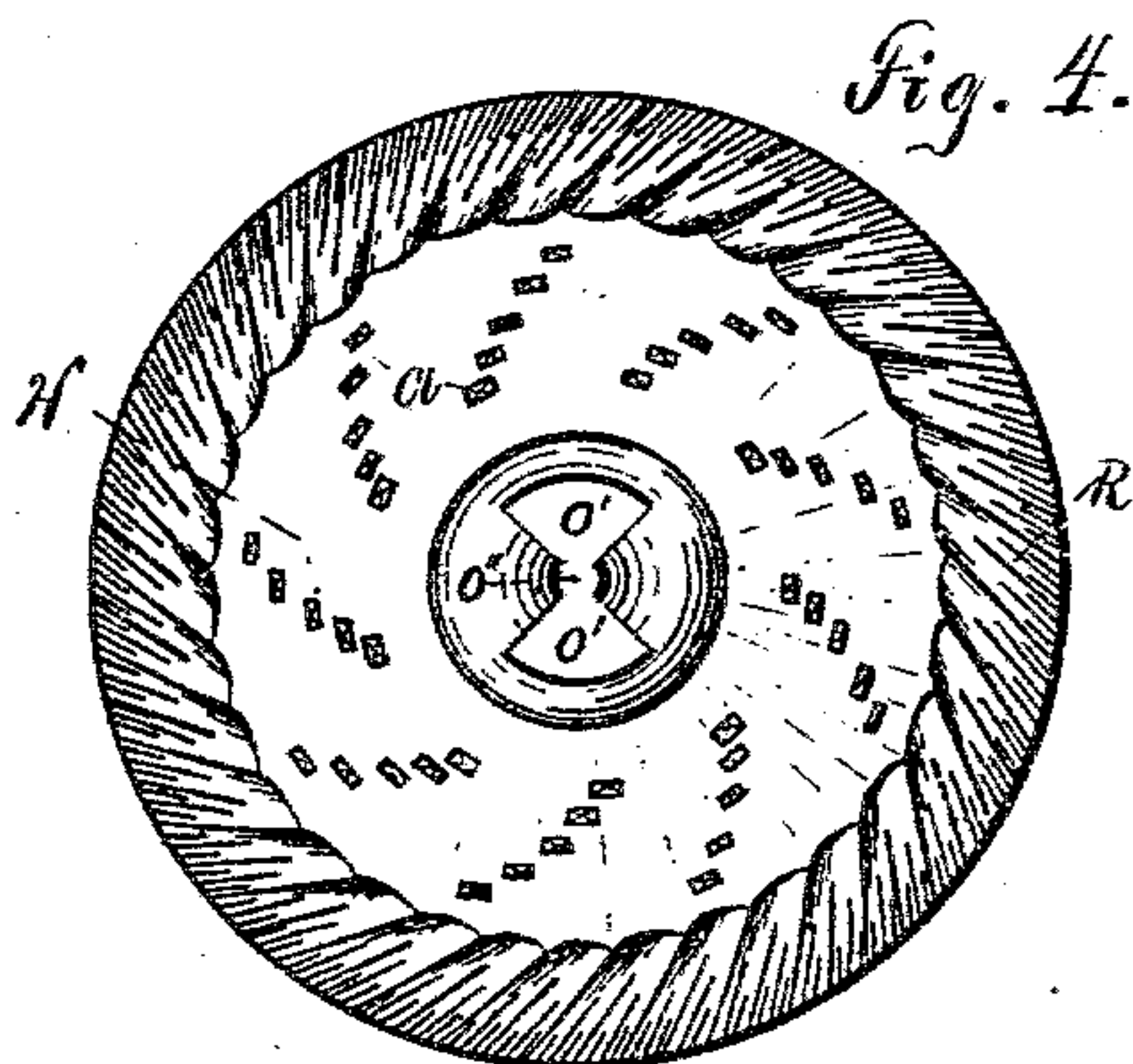


Fig. 4.

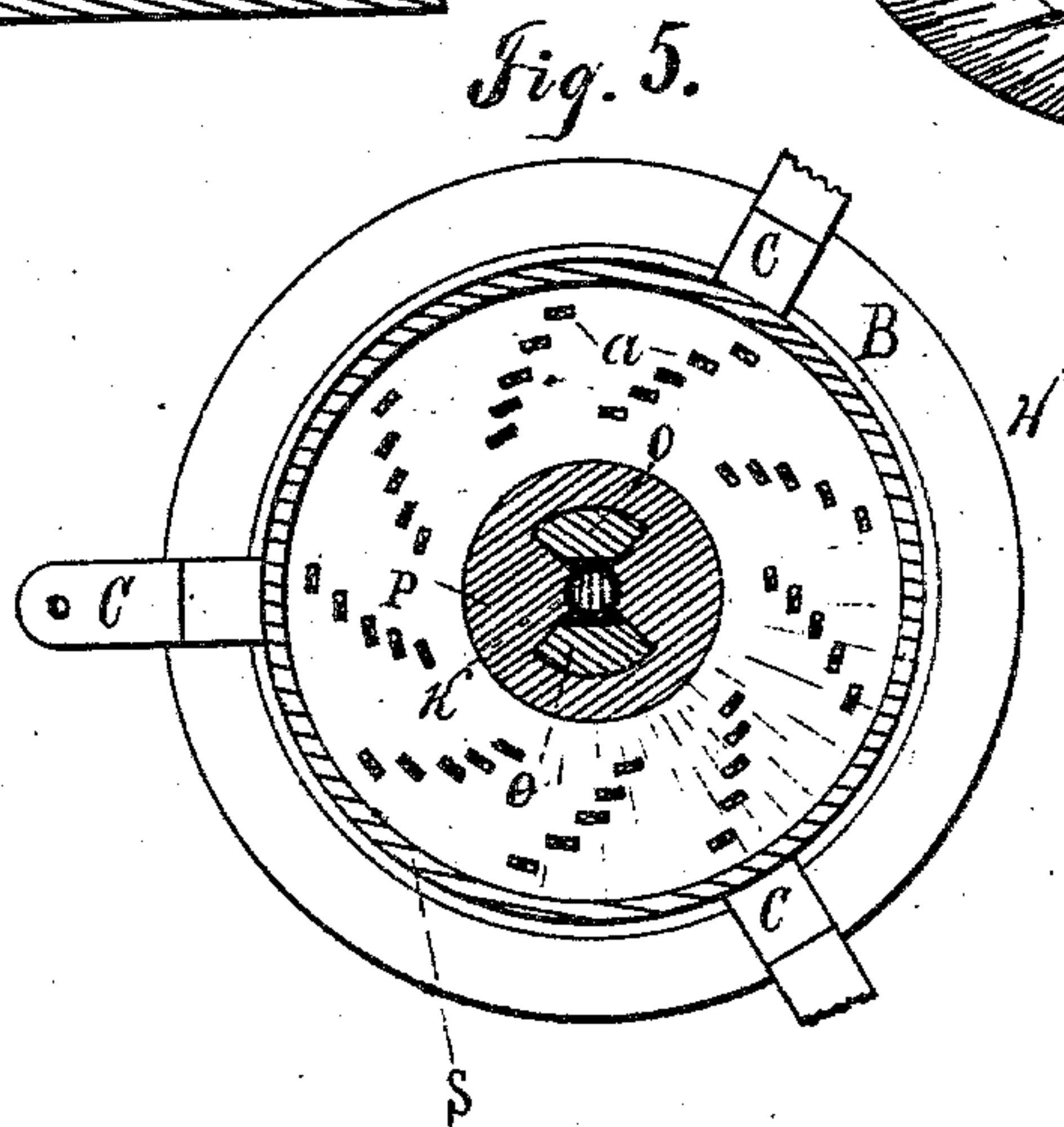


Fig. 5.

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# UNITED STATES PATENT OFFICE.

SILAS C. SCHOFIELD, OF FREEPORT, ILLINOIS.

## GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 283,518, dated August 21, 1883.

Application filed May 5, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, SILAS C. SCHOFIELD, a resident of Freeport, in the county of Stephenson and State of Illinois, have invented certain new and useful Improvements in Grinding-Mills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention is an improved sweep-actuated cone-and-shell mill of the class adapted to grind ear-corn. Its details are fully described and explained in the following specification and shown in the accompanying drawings, in which—

Figure 1 is a plan of the entire mill, except the hopper, the mill being attached to a suitable meal-box; Fig. 2, a bottom view of the rotating breaker F; Fig. 3, a central vertical section of the entire mill through line I V, Figs. 1 and 2, the movable parts of the mill having been rotated forty-five degrees from the position shown in Figs. 1 and 2 until the line I V, Fig. 2, coincides with the same line in Fig. 1; Fig. 4, a plan of the rotating cone H; and Fig. 5, a top view of a horizontal section of the mill, the plane of section passing through the line *x y*, Fig. 3.

In these views, A is an ordinary meal-box, to which is rigidly bolted a frame consisting of three radial arms, C, supporting a ring, S, formed integrally with them. Within the ring S and formed integrally with it are three radial arms, G, which lie in the same vertical planes as the outer arms, C, and are provided with coarse breaking-teeth, *a''*, on their upper faces, and with smaller breaking-teeth, *a'*, on their lower faces. A hollow cylinder, T, is formed integrally with the arms G at their inner ends, and serves as a bearing for the shaft of the movable part of the mill, as hereinafter stated.

To the inner faces of the arms C, immediately below the ring S, is rigidly fastened a grinding-ring, B, provided with outer ears, Q, which are secured by bolts to the arms C. The ring S and grinding-ring B are continuous, and form the stationary shell of the mill.

In the upper edge of the ring S is an annular groove, and in this groove rotates freely the convex lower edge of a movable ring, D, which is formed integrally with four radial breaking-arms, F, provided with coarse breaking-

teeth on their lower faces, so arranged as to pass between the teeth *a''* on the upper faces of the stationary arms G. The arms F are prolonged outside the ring D, forming the horizontal plates E, which are provided with bolt-holes for the attachment of sweeps. At their inner ends the arms F unite in a plate, M, which is centrally bored for a large bolt, K, which supports the cone H, as hereinafter set forth. On the lower face of the plate M is formed, integrally with it, a hollow cylindrical shaft, N, which is journaled in the hollow cylinder T, already mentioned, and is of about the same vertical length as said cylinder. Two sector-shaped lugs, O O, project downward below the lower face of the cylindrical shaft N and enter a suitable opening in the apex of the cone H, which hangs below. The cone is composed of two parts, of different inclination, the upper part being parallel to the breaking-arms G and the lower part to the grinding-ring B. The upper part is provided with small breaking-teeth, *a*, so arranged as to pass between the teeth *a'* on the lower faces of the arms G, while the lower part, R, of the cone is provided with grinding-ridges, which act in conjunction with the ridges on the ring B. At the apex of the cone is an opening composed of two opposite sectors, O' O', whose points meet in a small central circular opening, O''. The sector-shaped lugs O O of the cylindrical shaft N enter the sector-shaped openings O' O', while a bolt, K, passes upward through the central opening, O'', of the cone and through the central opening in the plate M. This bolt is screw-threaded at the upper end and provided with a hand-wheel, L, by means of which the cone may be raised or lowered. The lugs O O, in connection with the openings O' O', form a clutch, by means of which any rotary motion of the breaking-arms F is communicated to the cone H, and the bolt K forms a support for the cone, and at the same time permits sufficient rocking motion of the cone for adjustment to the inner surface of the shell.

The operation of the mill is evident. Ear-corn being placed in the hopper, power is applied to the sweeps and rotates the breaking-arms F. By means of the clutch described the cone H is rotated also. The ears are broken between the coarse breaking-teeth above the stationary arms G, fall on the upper surface of the cone H, and are further crushed between the



finer breaking-teeth  $a a'$ , and finally pass downward and are ground between the grinding-surfaces of the rings B R. The fineness of the meal is regulated by raising or lowering the cone  
5 by means of the bolt K and hand-wheel L.

The mill, as shown, may be used for a shelled-grain mill; but in the construction of a mill especially for grinding shelled grain the breaking-teeth may be dispensed with and the cone  
10 hung from a plain plate above the stationary shell.

I am aware that it is not new to combine in a grinding-mill a stationary shell, a sweep-carrying device rotating above said shell, and  
15 a cone suspended within the shell by means adapted to impart to it the rotary motion of the sweep-carrying device; and I am also aware that it is old to construct a mill having a stationary shell whose crown or upper portion is  
20 provided with breaking-teeth on its upper and lower faces, a rotating breaker above said shell and provided with breaking-teeth on its lower face, and a rotating cone provided with breaking-teeth on its upper face. I do not there-  
25 fore expect to claim or cover either of these constructions as my invention. The mill shown and described in this application, however, combines both these features or forms of construction, and is by reason of such combination  
30 greatly simplified and cheapened, and at the

same time its effectiveness is greatly increased as compared with any mill of its class with which I am acquainted.

Having now described my invention and explained its operation, what I claim as new, and  
35 desire to secure by Letters Patent, is—

The improved grinding-mill shown and described, consisting of the following parts: the stationary shell S, provided with breaking-teeth  $a'' a'$  on its upper and lower faces, respectively, and with a suitable grinding-ring, B, at-  
40 tached to its inner surface, the breaker F, rotating above said shell and provided with breaking-teeth  $a'''$  on its lower face, the cone H, suspended within the shell and from the breaker by  
45 means of a bolt, K, coincident with the axis of the mill, the nut L, engaging with said bolt and adapted to raise and lower the cone, and the downwardly-projecting central portion, O, of the breaker F, engaging with the cone and im-  
50 parting to it the rotary motion of the breaker, substantially as shown and described, and for the purpose set forth.

In testimony whereof I have signed this specification in the presence of two subscribing  
55 witnesses.

SILAS C. SCHOFIELD.

Witnesses:

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