

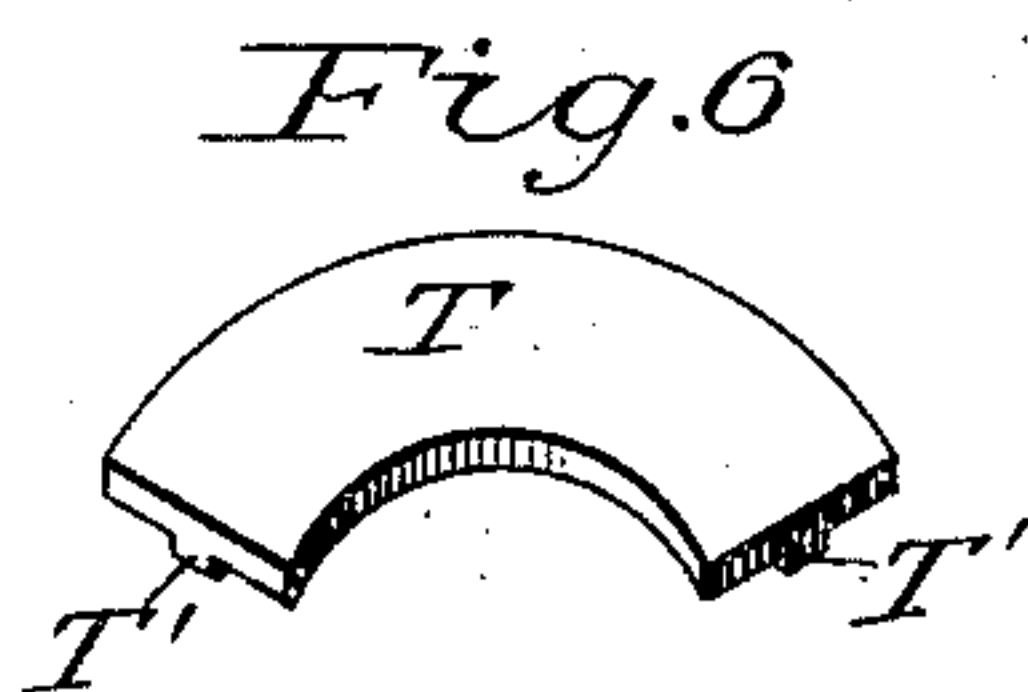
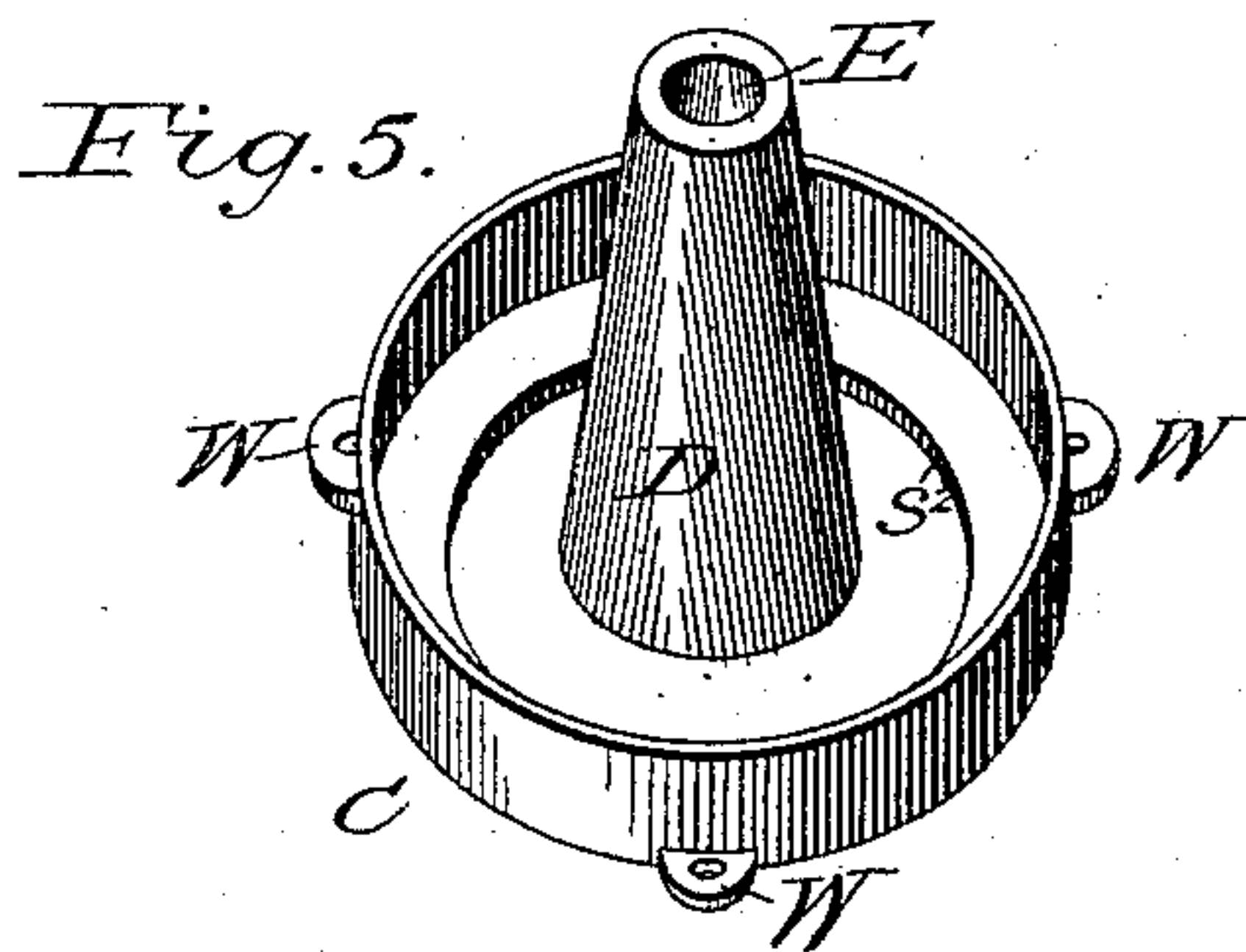
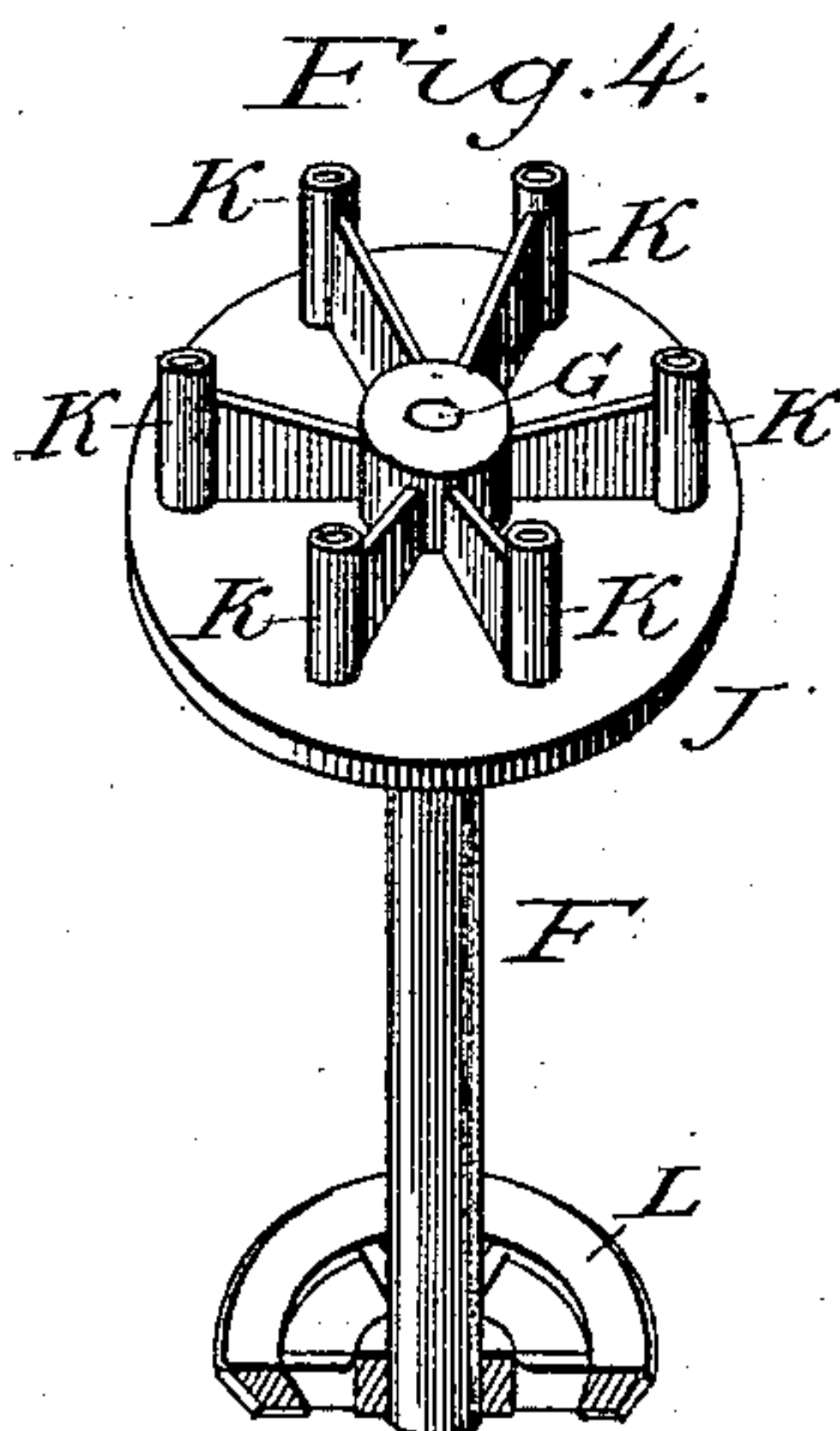
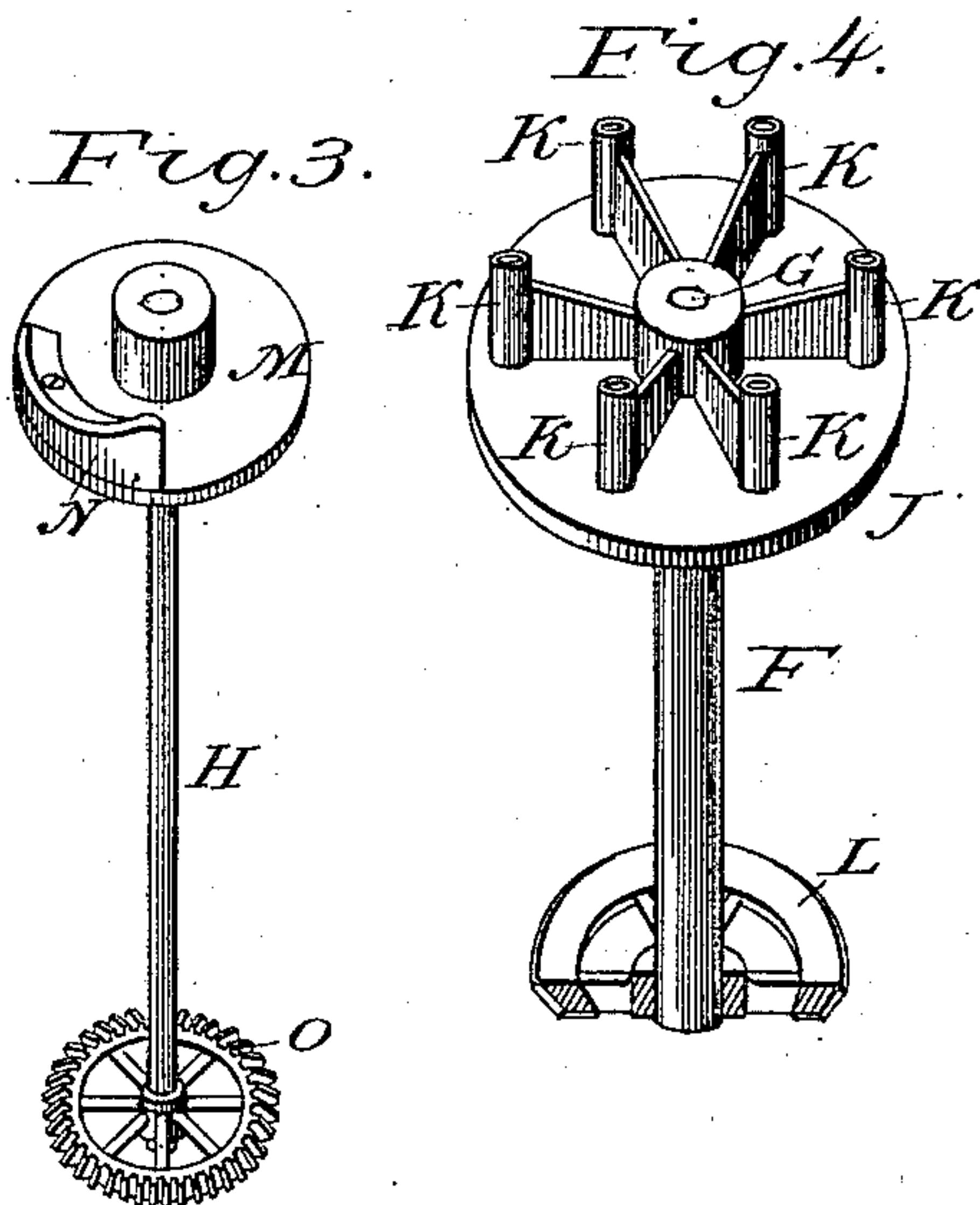
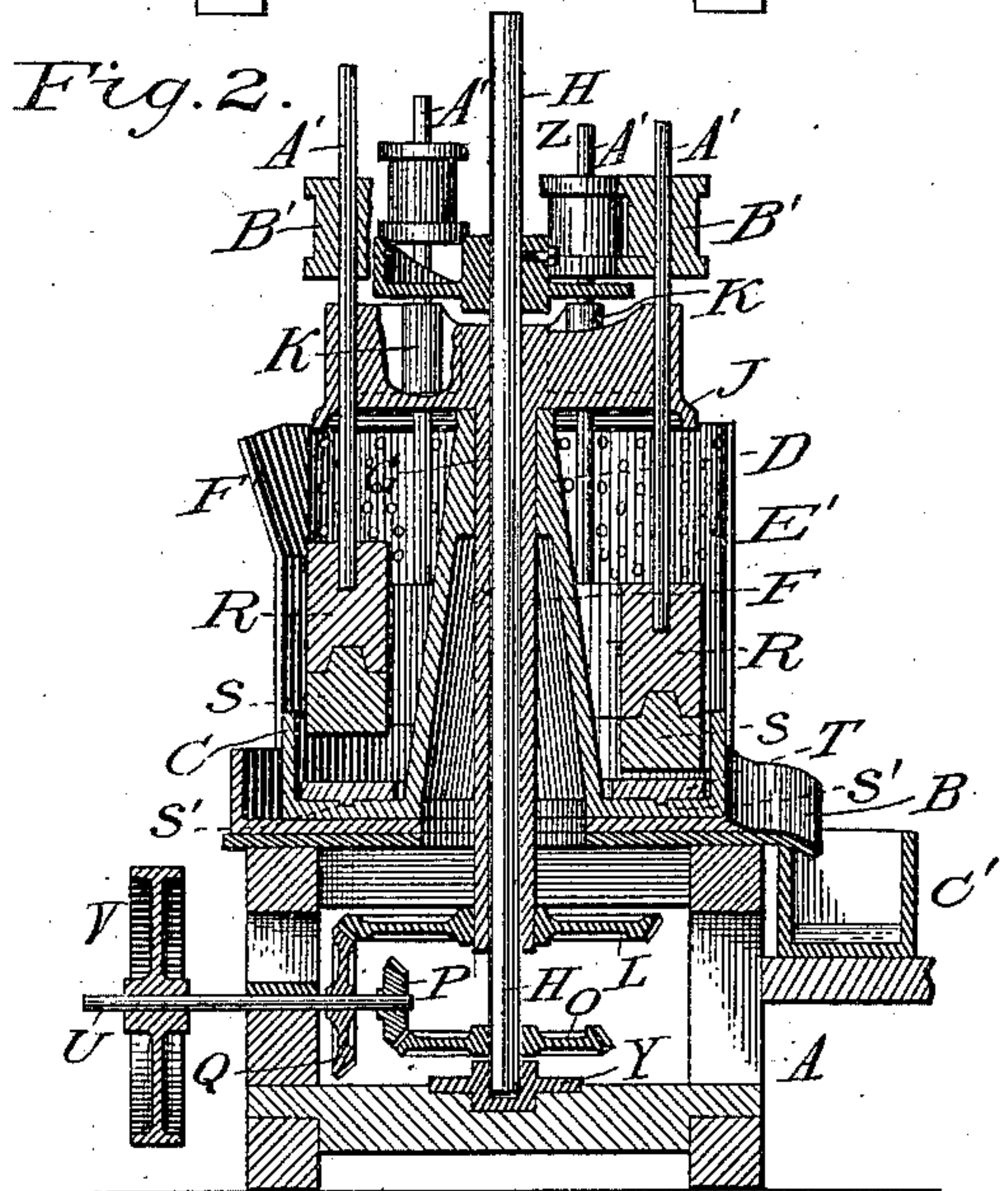
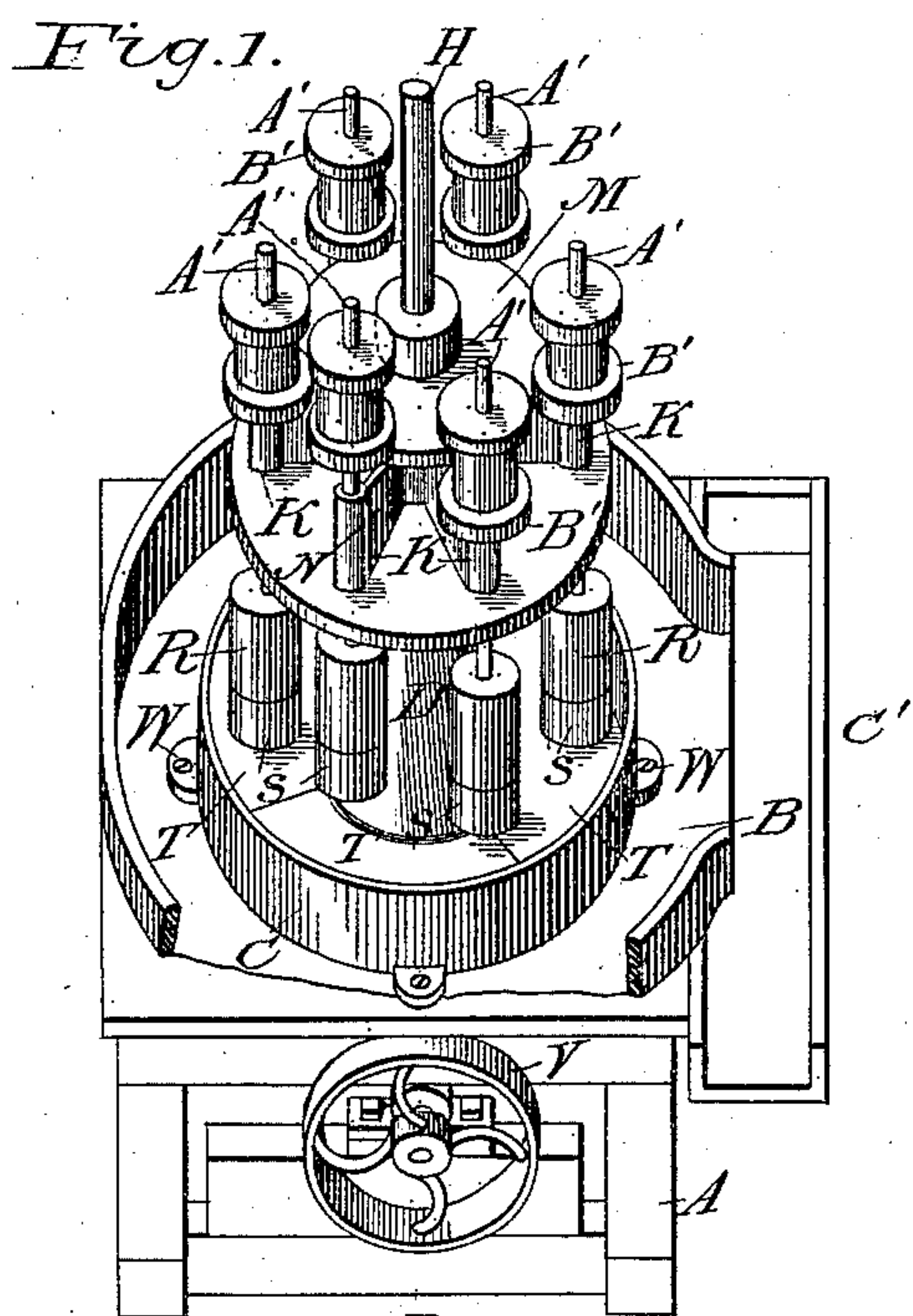
(No Model.)

A. E. REDSTONE.

QUARTZ MILL.

No. 311,032.

Patented Jan. 20, 1885.



Witnesses:

John H. Redstone  
L. E. Redstone

Inventor.

Albert E. Redstone.



# UNITED STATES PATENT OFFICE.

ALBERT E. REDSTONE, OF SAN FRANCISCO, CALIFORNIA.

## QUARTZ-MILL.

SPECIFICATION forming part of Letters Patent No. 311,032, dated January 20, 1885.

Application filed April 24, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT E. REDSTONE, a citizen of the United States, residing in the city and county of San Francisco and State of California, have invented a new and useful Quartz-Mill, of which the following is a specification.

My invention relates to improvements in quartz-mills where revolving stamps are employed in connection with one or more cams which also revolve horizontally in an opposite direction. It will be readily understood by reference to the accompanying drawings and the letters marked thereon.

Figure 1 is an isometrical perspective or bird's-eye view showing the mill complete, ready for the application of the belt or driving-power, except that the screen is removed to show the interior of the same. Fig. 2 is a sectional view showing the mill cut vertically through the center, to show more clearly the construction and arrangement of the interior of the mill, also showing the screen E' and the feed-opening F'. Fig. 3 is an isometrical perspective view showing the cam N, the cam-disk M, and the cam-shaft H, with the cam-driving wheel O attached. Fig. 4 is an isometrical perspective view showing the stamp-revolving disk J, with the stem-guides K, and the hollow shaft F, with the stamp-driving wheel L attached. Fig. 5 is an isometrical perspective view of the mortar C, with central cone, D, bored at E to receive the hollow driving-shaft F. Fig. 6 is a perspective view of one of the dies T, which are generally constructed in sections reaching about one-third around the floor of the mortar.

The following is the construction of my improved quartz-mill.

A represents the frame; B, the mortar curb or trough; C, the mortar; D, the conical bearing in which the hollow shaft F is revolved.

F is the sleeve or hollow shaft, which has the bore G, to form the bearing in which the cam-shaft H revolves. It also carries the disk J and guides K, in which the stems A' operate.

The disk J, the hollow shaft F, and the stem-guides K are cast in one piece for small mills, although in the larger mills I sometimes cast the shaft F separately and attach by a set-screw, in the usual way.

H represents the cam-shaft, which carries

the cam-disk M, to which the cam N is attached. It is revolved by the wheel O, as will be shown.

P represents the means by which the wheel O is operated.

Q represents the beveled wheel by means of which the wheel L is operated.

R represents the stamps; S, the shoes; T, the dies; U, the driving-shaft, and V the driving-pulley.

W represents lugs by which the mortar is bolted down.

A' represents the stems to which the stamps R are attached.

B' represents the tappets.

C' represents the discharge-trough.

E' represents the screen.

F' represents the feed-opening.

The following is the operation of my improved quartz-mill: The quartz, as it comes from the rock-breaker, is fed in through the feed-opening F' as quartz-mills are usually fed. The mill is set in motion by a belt upon the driving-pulley V, which revolves the shaft U, consequently revolving the bevel-wheel Q and the pinion P. The beveled wheel Q gearing with the wheel L on the under side, and the pinion P gearing with the wheel O on the upper side, they are revolved in opposite directions, thus revolving the disk J, which carries the stem-guides K (and consequently revolves the stems A', with the stamps R and the shoes S, and tappets B') in the direction to cause the tappets B' to roll up on the incline of the cam N. At the same time the pinion P, revolving the wheel O in the opposite direction, revolves the cam-shaft H and cam N backward under the tappets B', as shown. The stamps R being revolved at a different speed from that at which the cam N is revolved, the stamps, as they are dropped from the cam N, strike over different parts of the die T at each drop, thus securing the even wear of the same. It will be seen that while one stamp is dropping upon the quartz and one rising upon the cam the remainder are carried around over the die, and the part of the stamp farthest from the center of the mortar having farther to travel, and consequently being subjected to the greater friction, the stamp is kept revolving horizontally, thus keeping an even surface to the shoes—in fact,



wearing them perfectly smooth. As the cam N raises the tappet B' it whirls the stamp in an opposite direction from that which it is revolved by the friction in grinding as it passes around over the dies; consequently the outer part of the shoe strikes with increased velocity and adds materially to the effectiveness of the blow upon the quartz.

By my improved construction I not only secure a great pulverizing capacity, but avoid the necessity of an outside supporting-frame, thus leaving the whole circumference of the mill as a screening-surface, which is of great importance where it is required to crush very fine, for much of the ore which has been considered rebellious and impracticable to work by the old-fashioned stamp-mill is now found, when crushed sufficiently fine and properly rubbed, to work to a very high percentage of its assay value.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In quartz-mills, the hollow shaft or sleeve F, provided with the disk J, having stem-guides K, in combination with the cam-shaft H, provided with the disk M, having cam N, shaft H, the stamps R, and gearing for carrying said stamps and cam in opposite directions, substantially as and for the purposes set forth.

2. In quartz-mills, the bevel-wheel Q, pinion P, wheels L and O, the hollow shaft F, having guide-disk J K, the cam-shaft H, having disk and cam M N, and the stamps R, all combined substantially as and for the purposes set forth.

In witness whereof I have hereunto set my hand.

ALBERT E. REDSTONE.

Witnesses:

JOHN H. REDSTONE,  
L. E. REDSTONE.