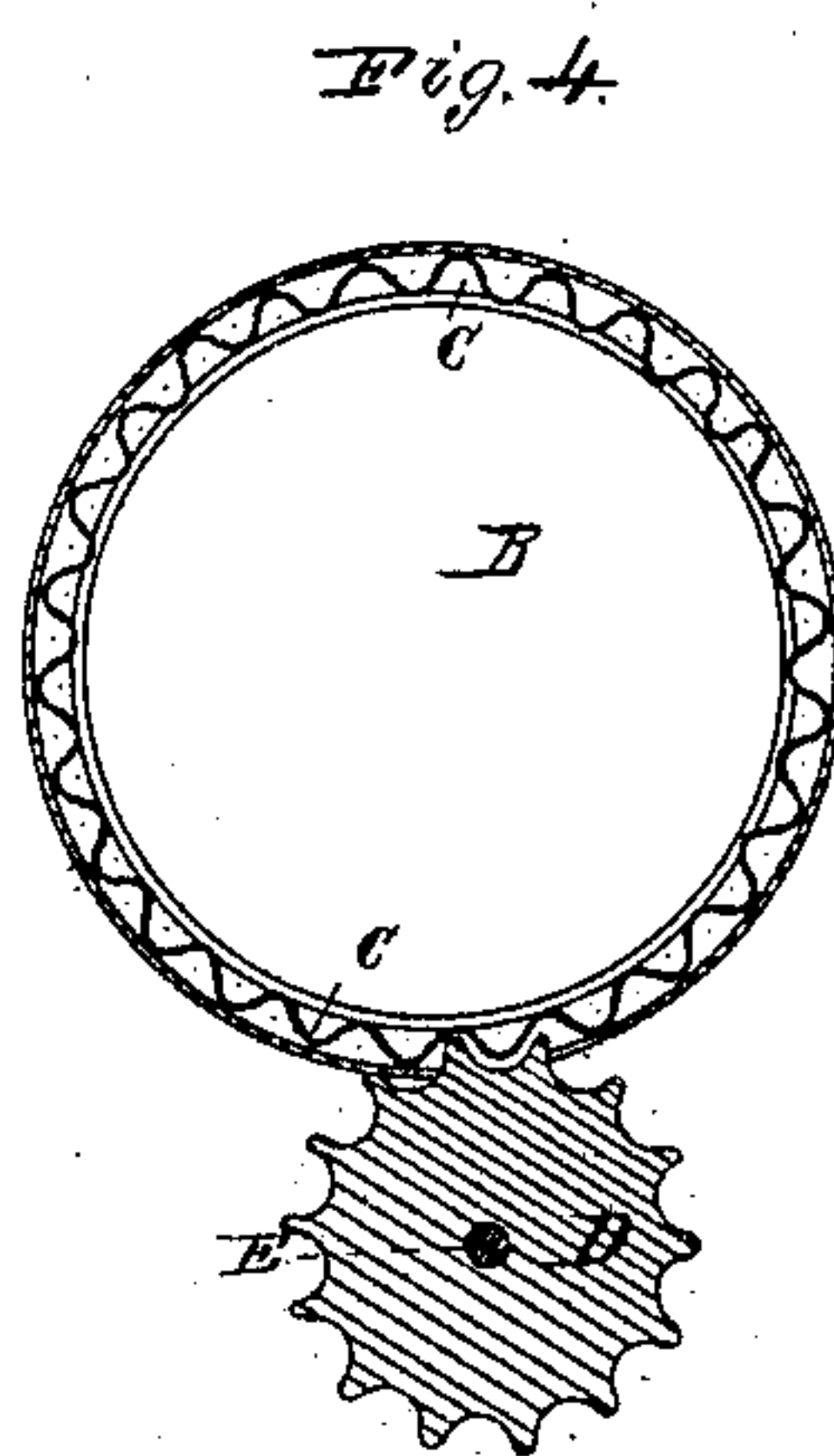
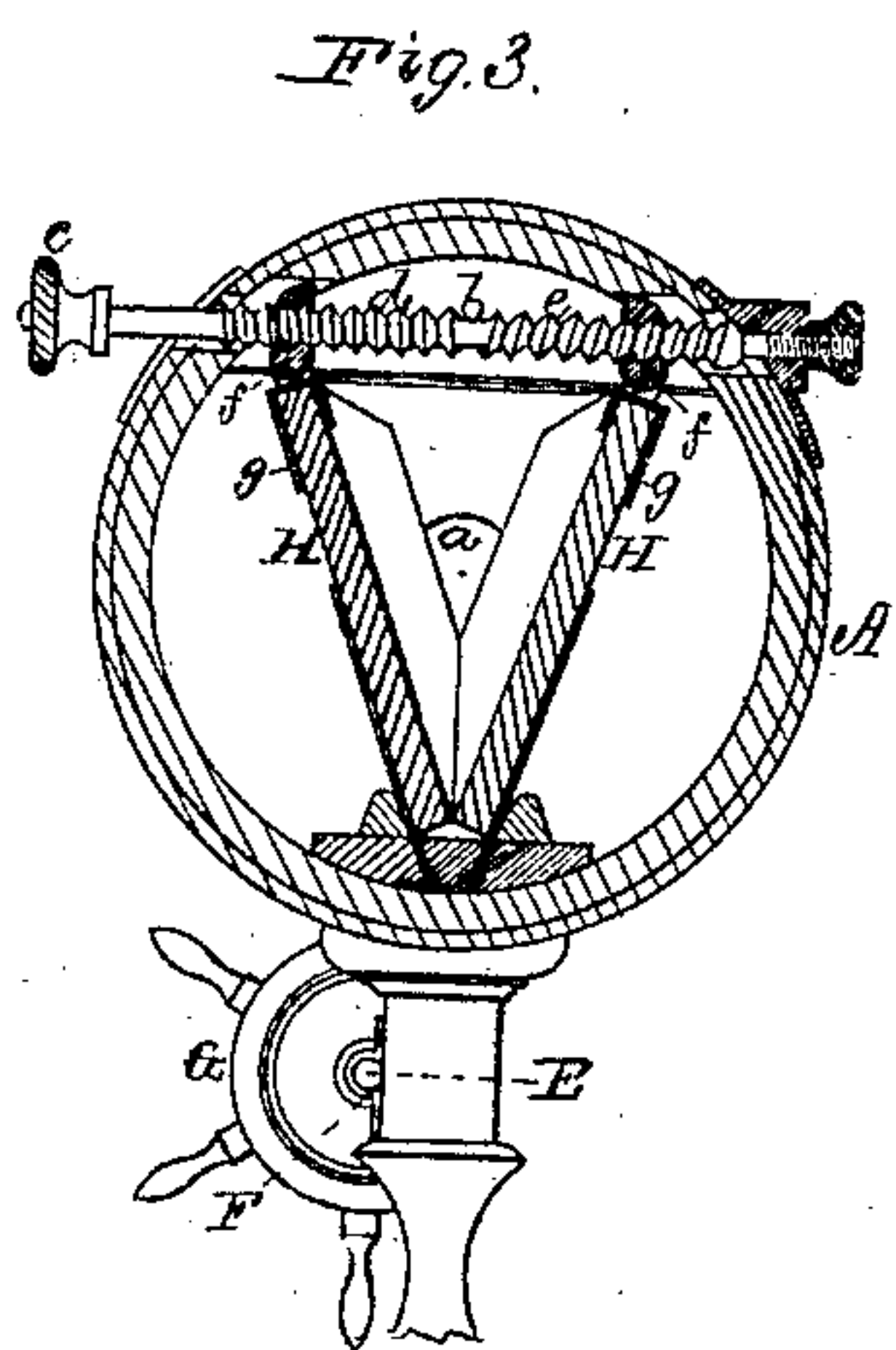
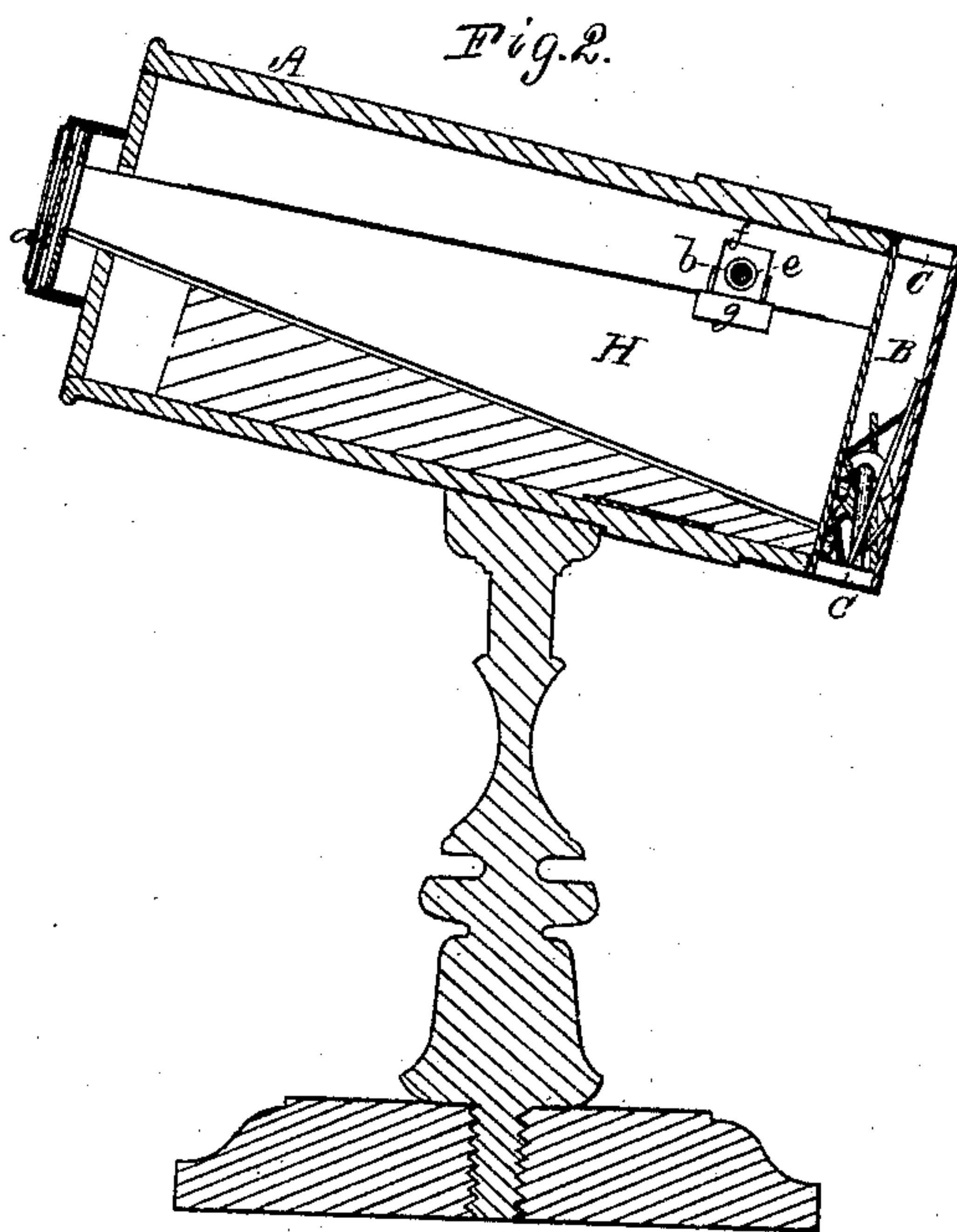
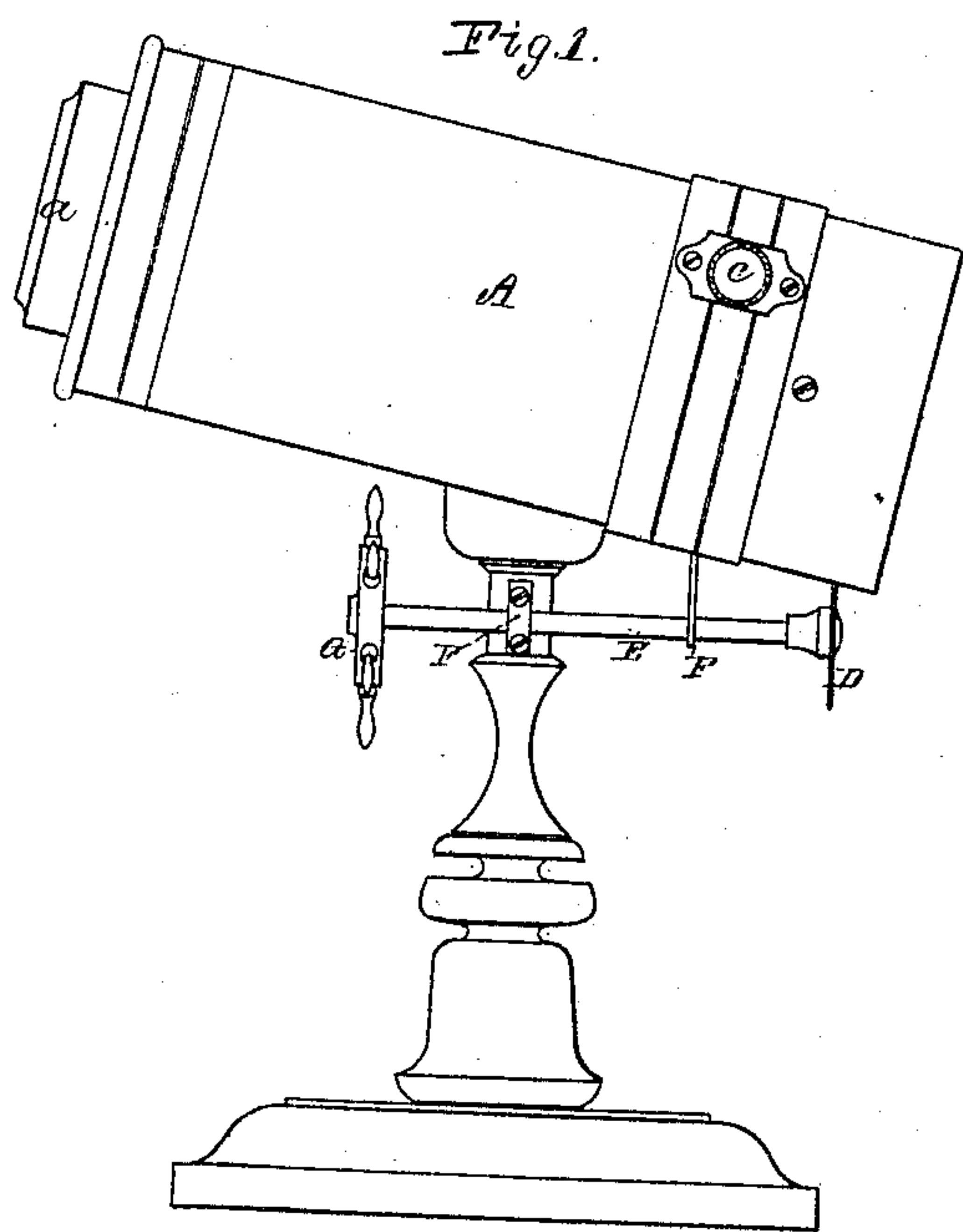


R. F. MACY.
KALEIDOSCOPES.

No. 174,690.

Patented March 14, 1876.



Witnesses.
S. W. Piper
L. A. Haller

Robert F. Macy.
by his attorney
N. H. Sedy

UNITED STATES PATENT OFFICE.

ROBERT F. MACY, OF NANTUCKET, MASSACHUSETTS.

IMPROVEMENT IN KALEIDOSCOPES.

Specification forming part of Letters Patent No. **174,690**, dated March 14, 1876; application filed April 29, 1875.

To all whom it may concern:

Be it known that I, ROBERT F. MACY, of the town and county of Nantucket, of the State of Massachusetts, have invented a new and useful Improvement in Kaleidoscopes; and do hereby declare the same to be fully described in the following specification, and represented in the accompanying drawings, of which—

Figure 1 is a side view, Fig. 2 a longitudinal section, and Figs. 3 and 4 are transverse sections, of a kaleidoscope, embodying my invention.

The first part of my invention relates to a rotary agitator arranged within the object box or case, and provided with mechanism for revolving it thereon, in order to agitate and turn over the objects in the box.

The second part of my invention relates to the simultaneous adjustment of the reflectors to different inclinations, and to mechanism for effecting such.

In the drawings, A denotes the main tube, and B the object box or chamber, of a kaleidoscope. Within the latter is the rotary agitator C, which, as shown, is a corrugated annulus, constructed to engage, like a cogged wheel, with a pinion, D, fixed on a shaft, E, and extending into the object-box through an opening in its side. The shaft E, supported in suitable projections F F, and arranged outside of the tube A, as shown, has a hand-wheel, G, fixed on its inner end, to enable it to be readily revolved by a person while looking into the instrument, with his eye at the eye-piece *a*. On revolving the agitator, the objects within the box will be turned over and over, as occasion may require.

The reflectors seen at H H are to be hinged or applied together at their lower edges in any proper manner, to keep them in contact and admit of their being adjusted to different angles of inclination to each other, they being provided with a mechanism by which they may be simultaneously moved either toward or apart from each other.

This mechanism consists of a shaft, *b*, provided with a milled head, *c*, and also with two male screws, *d e*, one being a right and the other a left hand one of like pitch of thread. Such

screws are provided with, and screw through, nuts *f f*, to which are jointed two forks, *g g*, that embrace the two reflectors at their upper edges. The shaft goes transversely through the tube A, and over the reflectors, and is supported in suitable bearings. On revolving it, the two nuts will be moved simultaneously, and consequently the reflectors will be correspondingly moved, the forks readily adjusting themselves to the movements of the nuts, and holding the nuts from revolving.

By varying the angle of inclination of the mirrors or reflectors, a greater or less number of reflections may be obtained.

By the employment of the annular agitator in the object-box, we are saved the necessity of revolving the latter or the main tube, and also the inconvenience of reaching out to the box in order to agitate or turn the objects.

I am aware that in polyangular kaleidoscopes one reflector has been stationary and the other adjustable, with reference to it. I do not claim such, as I have both reflectors simultaneously movable, they being supported at their lower edges so as to readily move without their getting out of contact, all of which enables me to make the instrument cheaper than it is usually constructed, with one of the reflectors only adjustable in inclination to the other.

I claim as my invention, in the kaleidoscope, as follows, viz:

1. The combination of the separate annular agitator C, with the object-box B, and the main tube A, such agitator being arranged in said box and provided with a mechanism for effecting its revolution, all as and for the purpose specified.

2. The combination of the shaft *b*, provided with its two right and left screws *d e*, with the nuts *f f*, and the forks *g g*, hinged thereto, as set forth, the whole being for simultaneously moving the reflectors so as to change their angle of inclination.

ROBERT F. MACY.

Witnesses:

R. H. EDDY,
S. N. PIPER.