J. R. MICKEY.

Churn.

No. 31,554.

Patented Feb. 26, 1861.

Fig. 3

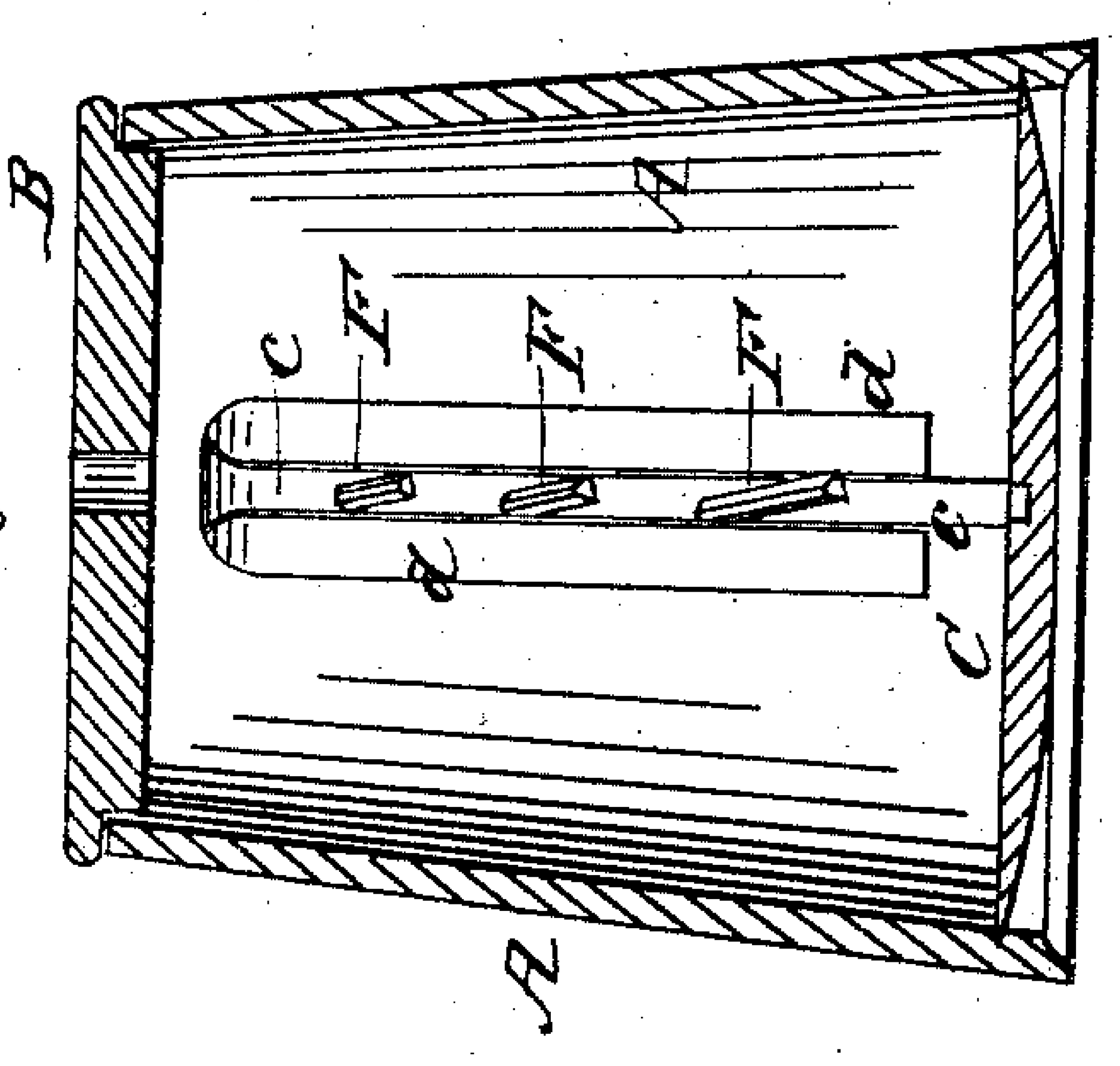


Fig. 6

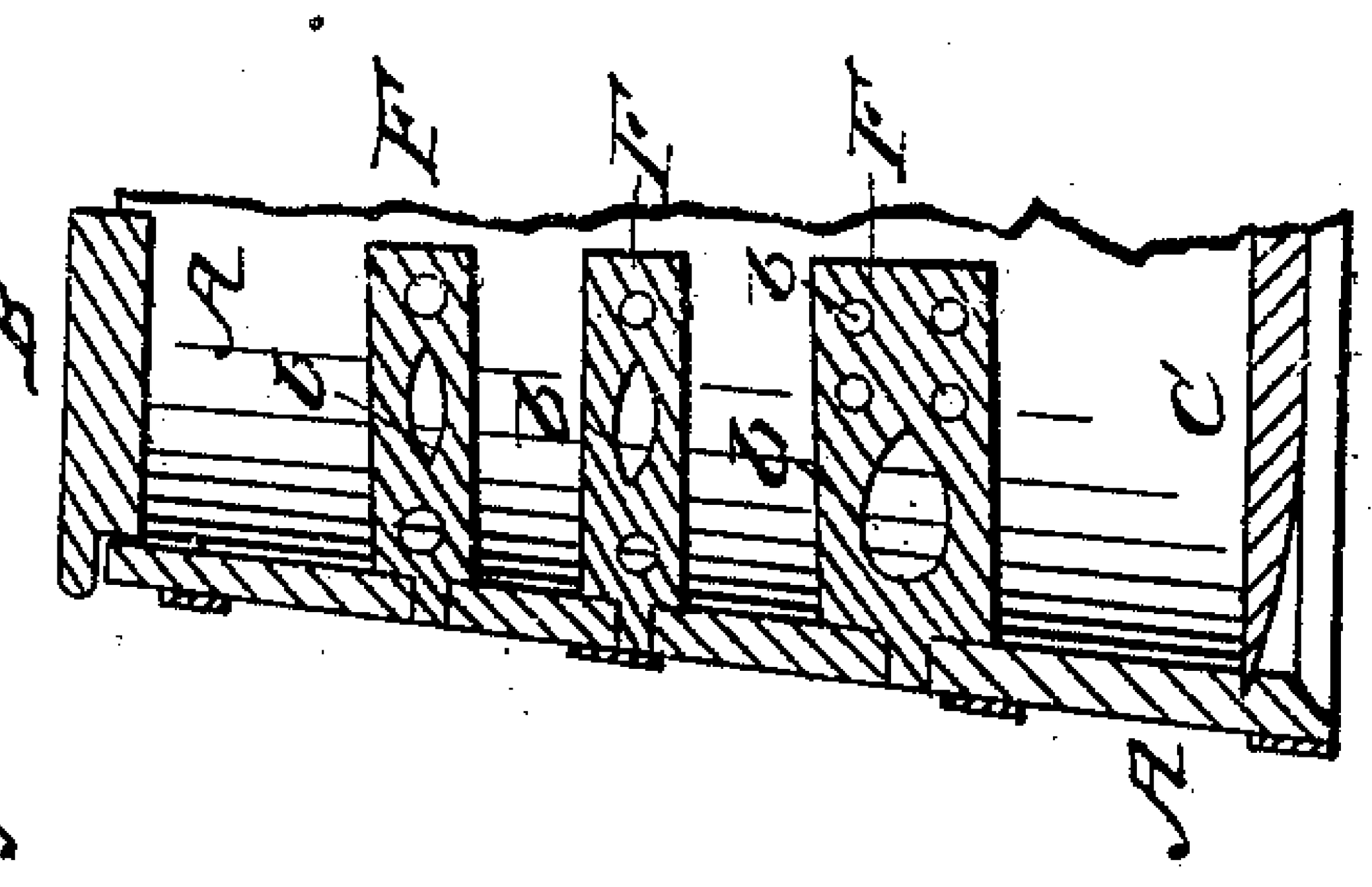


Fig. 2

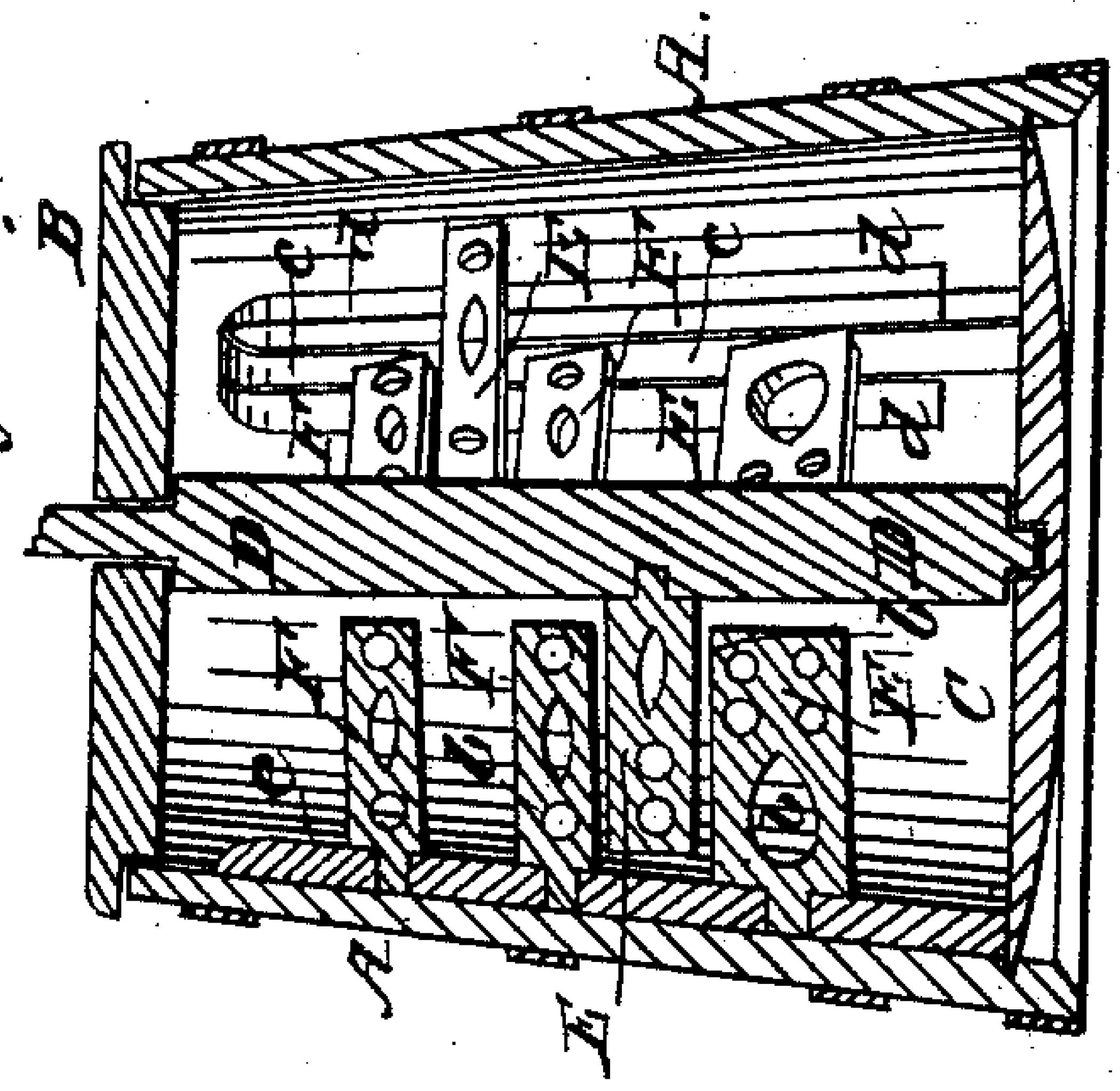


Fig. 5

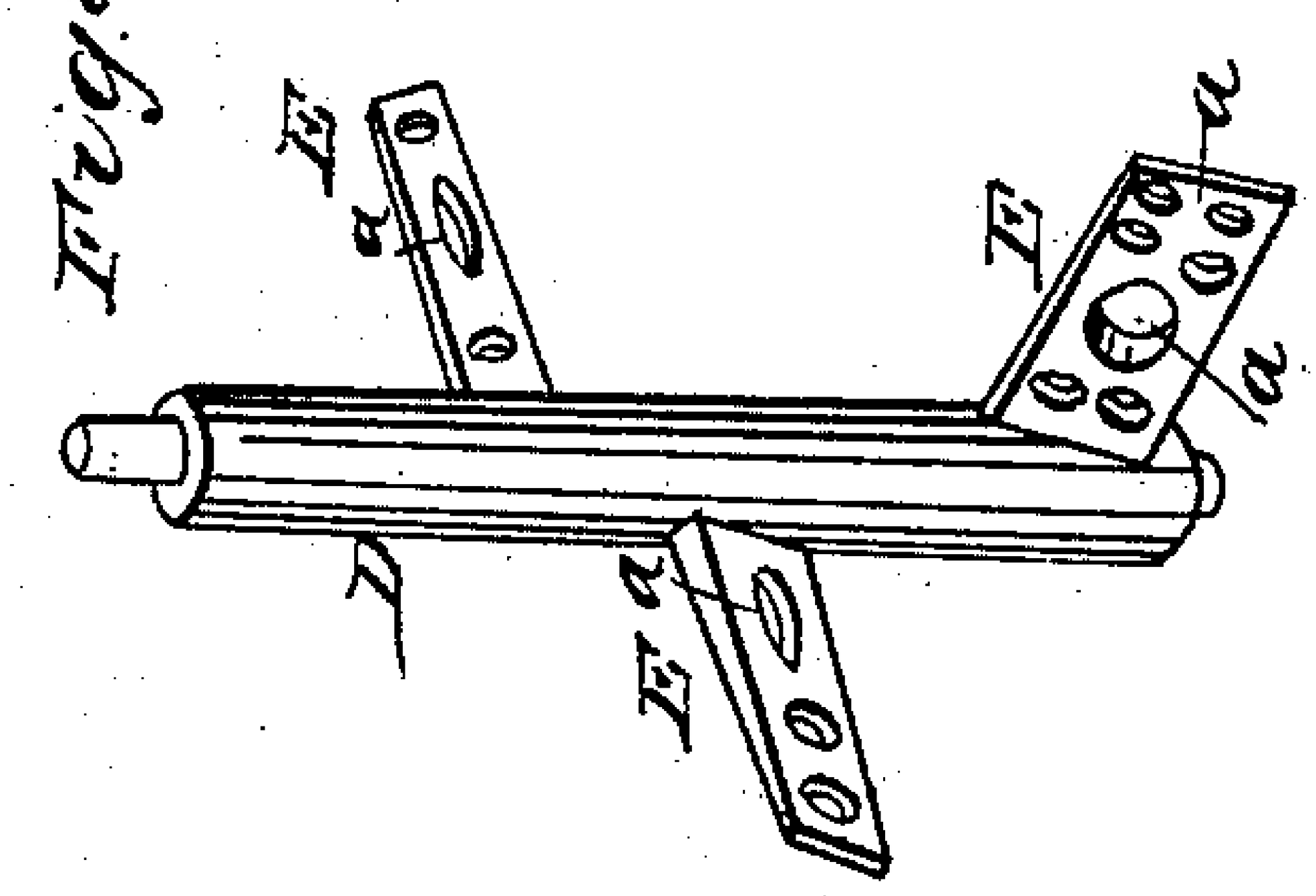


Fig. 1

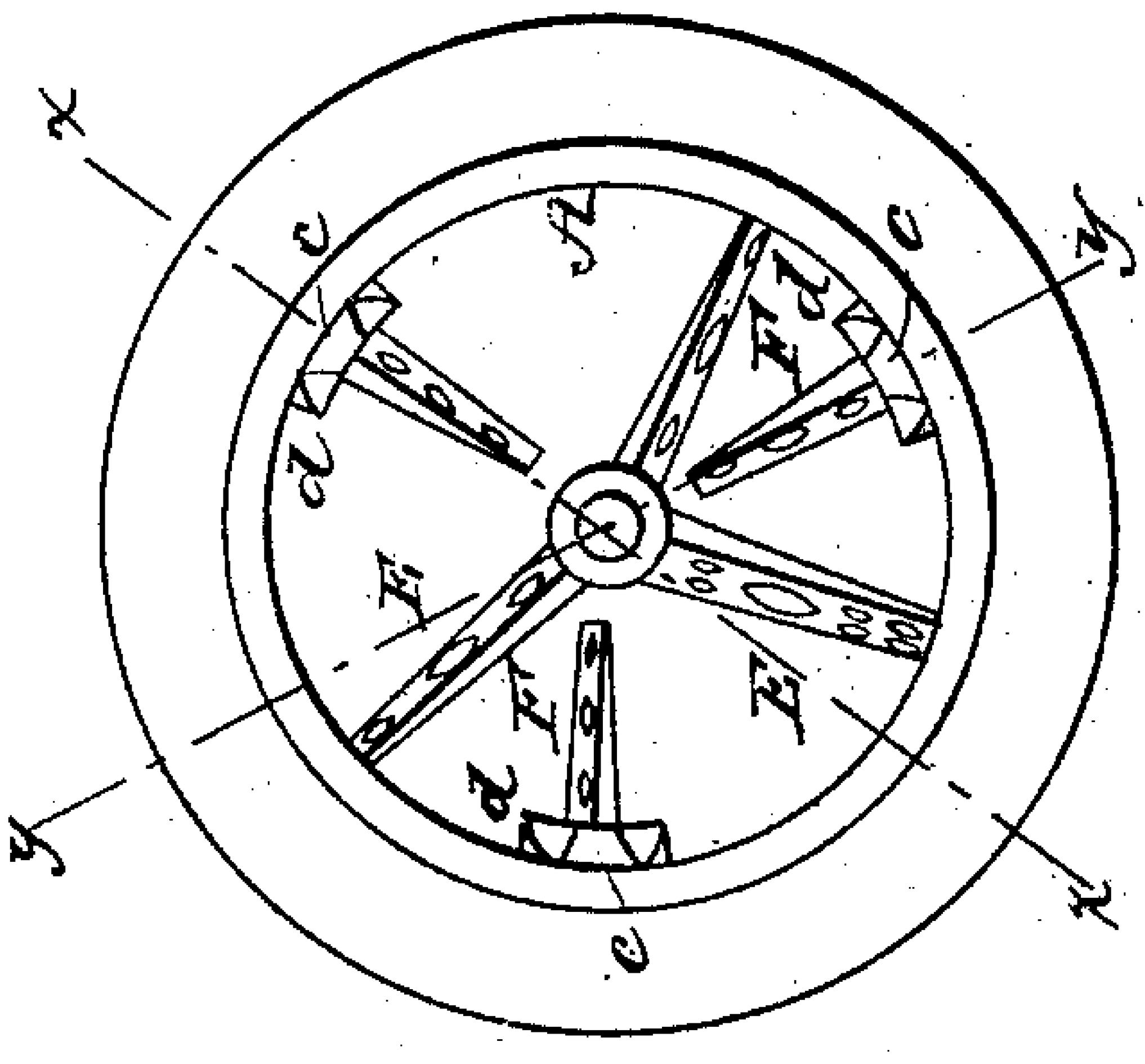
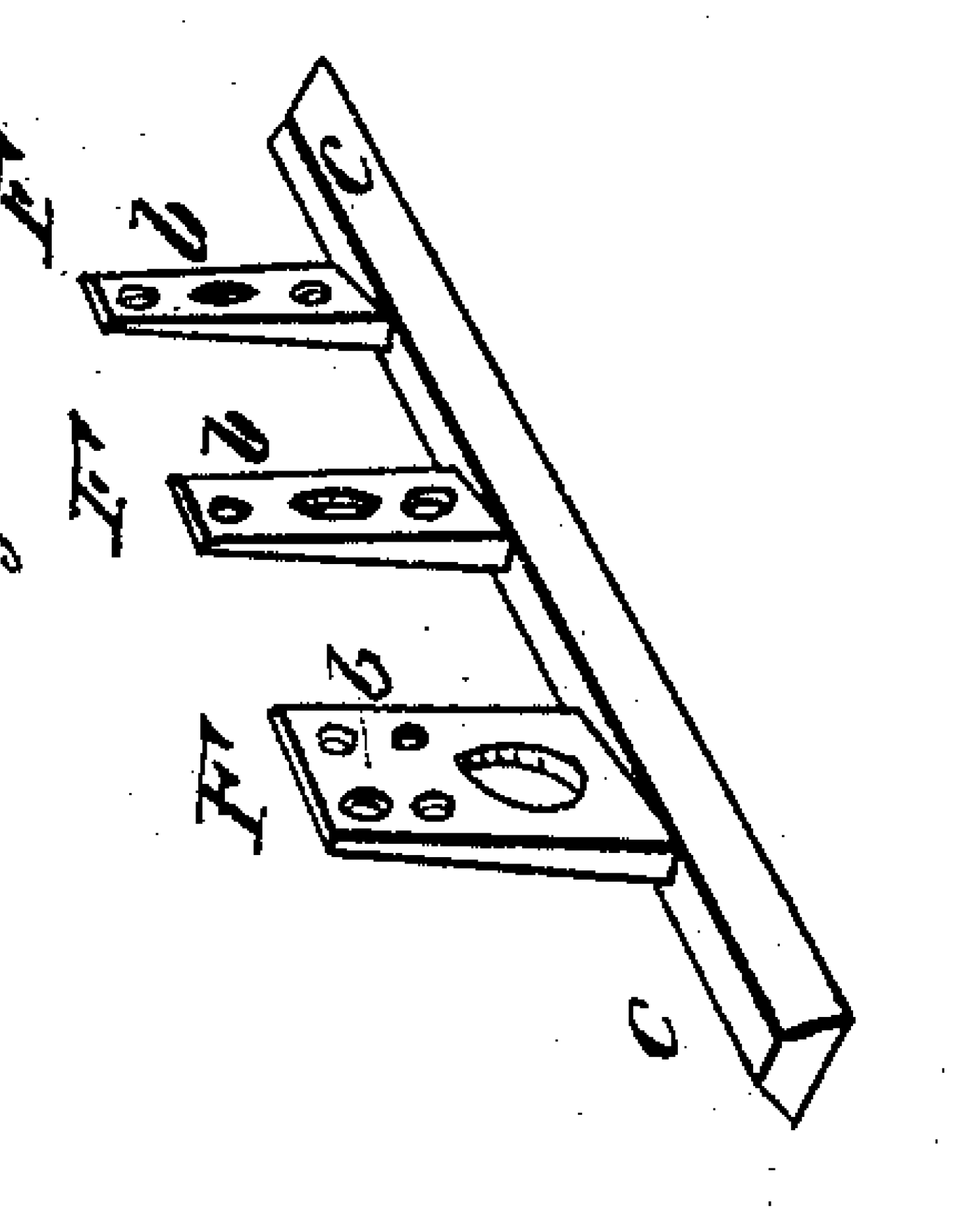


Fig. 4



Witnesses
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UNITED STATES PATENT OFFICE.

JOHN R. MICKEY, OF WATERFORD, PENNSYLVANIA.

CHURN.

Specification of Letters Patent No. 31,554, dated February 26, 1861.

To all whom it may concern:

Be it known that I, JOHN R. MICKEY, of Waterford, in the county of Erie in the State of Pennsylvania, have invented certain new and useful Improvements in Churns; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this application.

My invention has for its object a simple and effective churn which will churn sweet milk in a short space of time; and my said invention consists in a novel combination of devices in the construction of the churn as will be hereinafter fully described.

To enable those skilled in the art to make and use my invention, I will proceed to describe the construction and operation of my improved churn referring by letters to the accompanying drawings forming part of this specification and in which—

Figure 1. is a top view of my improved churn. Fig. 2. is a vertical section at line *x x* of Fig. 1. Fig. 3. is a vertical section of tub and its paddles at *y. y.* Fig. 1. (with shaft extricated) Fig. 4. is a perspective view of the paddle slides detached. Fig. 5, is a perspective view of shaft and its paddles—and Fig. 6. is a partial vertical section of tub showing its paddle attached directly instead of to slides.

In the several figures the same part is designated by the same letter.

A. is the tub which may be varied in form, that which I have adopted is shown as in shape of the frustum of a cone, this tub is constructed, as usual, with a stationary bottom and removable top, or lid B. In the center of this tub A. is hung (in suitable bearings in the top B. and bottom C.) a vertical shaft D. on which are arranged radially projecting paddles E. perforated with holes *a*. From the internal surface, or periphery of tub A. there projects similar paddles or breakers F. These projecting paddle pieces F. are arranged in three series as illustrated, with about equal spaces between the paddles in each series, and with the series about equidistant around the tub—these paddles F. are all set obliquely, being inclined at about an angle of 70° and the paddles E. of the rotating shaft D. are inclined to about the same angle, but in an opposite direction, that is to say, so that if the planes in which the paddles E. and F lie were extended they would intersect each other. I propose to make the lower paddles; both of the tub and the shaft wider than the others and the others diminishing in width gradually toward the top of the series (see Figs. 2, 4 and 6.)

a. and *b*. represent variously shaped holes, or perforations in the paddles E. and F. which holes may be varied in size, shape and number without departing from the spirit of my invention.

The dashers or paddles E. are so arranged as to pass between the paddle pieces F. as the shaft D. is rotated, and the said paddles E. are so arranged circumferentially on the shaft, as that no two of them will pass simultaneously between the beaters F. This relative arrangement of beaters E and F. is seen at Fig. 1. Each set of beaters F is secured to a slide bar *c*. which is of dove-tail shape in a cross section (see Figs. 1 and 4) and which fits in between two retaining strips or jaws *d*. between which jaws said strip *c*. may be inserted and extracted vertically at pleasure. The said strips *c*. when in position as shown at Figs. 1, 2 and 3 extend down to and come in contact at their lower extremities with the bottom C. of the tub—but the retaining strips *d*. it will be seen, though even at top with ends of strips *c*. do not extend down to bottom C. of tub: This feature of construction as also the removable slide bars, or paddle holders *c*. constitute part of my present invention, the object and advantages of making the bars *c*. removable is to easily extract them to admit of gathering the butter on the paddles of shaft D. and by thus arranging said bars *c*. the butter can be more readily collected and the paddles F. can be easily cleaned off. By leaving a space between the lower ends of retaining bars *d*. and the bottom C. as shown and described: it will be seen, that when the bars *c*. are inserted from the top (after the butter is taken out) any particles which may have lodged in the dovetail groove will be forced out at the lower end from whence they can be readily gathered, before the strip *c*. is forced down onto its bearing on bottom C. But it will be understood that the first and principal part of my invention may be used, without adopting the other features of novelty in my improved churn, for instance the paddles F. instead of being arranged in slide bars *c*. may be secured to the sides of the tub as illus-

trated at Fig. 6 of the drawing—and the leading feature of my present invention will not be at all effected by such change of arrangement; the relative arrangement and operation together, of the two sets of paddles being the same in both cases.

It will be understood that by the arrangement of a series of paddles E. on shaft D. inclined as specified, in combination with the inclined paddle F. as described, the rotation of shaft D. will cause the milk to be continually raised and lowered alternately and rapidly and forced through the holes *a* and *b*. The inclination of paddles E. has a tendency to continually elevate the milk while the tendency of paddles F. is opposite and the consequence is that the milk is greatly agitated and so acted upon that the globules are rapidly broken and butter produced in an incredibly short time.

I am not aware that any churn has been used previous to mine which would be practical in churning sweet milk; this has been for some time a desideratum aimed at by all constructors and operators, as large premiums have been offered for butter made of sweet milk. I have made and used my improved churn and produced from three gallons of sweet milk three and a quarter pounds of butter in three and a half minutes.

It will be understood that the number and size of the paddles may be varied at pleasure to suit the constructor's will and the size and shape of the bucket, or tub may be varied without departing from my invention.

I have shown the shaft D. extended short distance through top B. and broken off but it will be understood that the upper end of said shaft is to be connected by gearing to suitable driving handle in any of the known ways to admit of the said shaft being rapidly rotated in its bearings.

I am aware that the paddles in the case have been arranged obliquely in combination with vertical paddles on the shaft and also that in the case of John O'Neil rejection June 24, 1852 the stationary and rotating paddles are both made tapering in two directions, and are solid, or without any perforations and I disclaim any such mode of construction.

Having explained the construction and operation of my improved churn and remarked its principal advantages, what I claim as new therein and desire to secure by Letters Patent is—

The stationary, perforated paddles F. in combination with the rotating perforated paddles E; when the two sets of paddles (F and E) consist of simple planes, and are arranged obliquely in opposite directions substantially as described for the purposes set forth.

In testimony whereof I have hereunto set my hand and affixed my seal this 21st day of December 1860.

JOHN R. MICKEY. [L. S.]

Witnesses:
J. N. McIntire,
L. E. Newton.