

No. 764,846.

PATENTED JULY 12, 1904.

J. HIRSCHENFELD.
CHURN.

APPLICATION FILED MAR. 21, 1904.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.

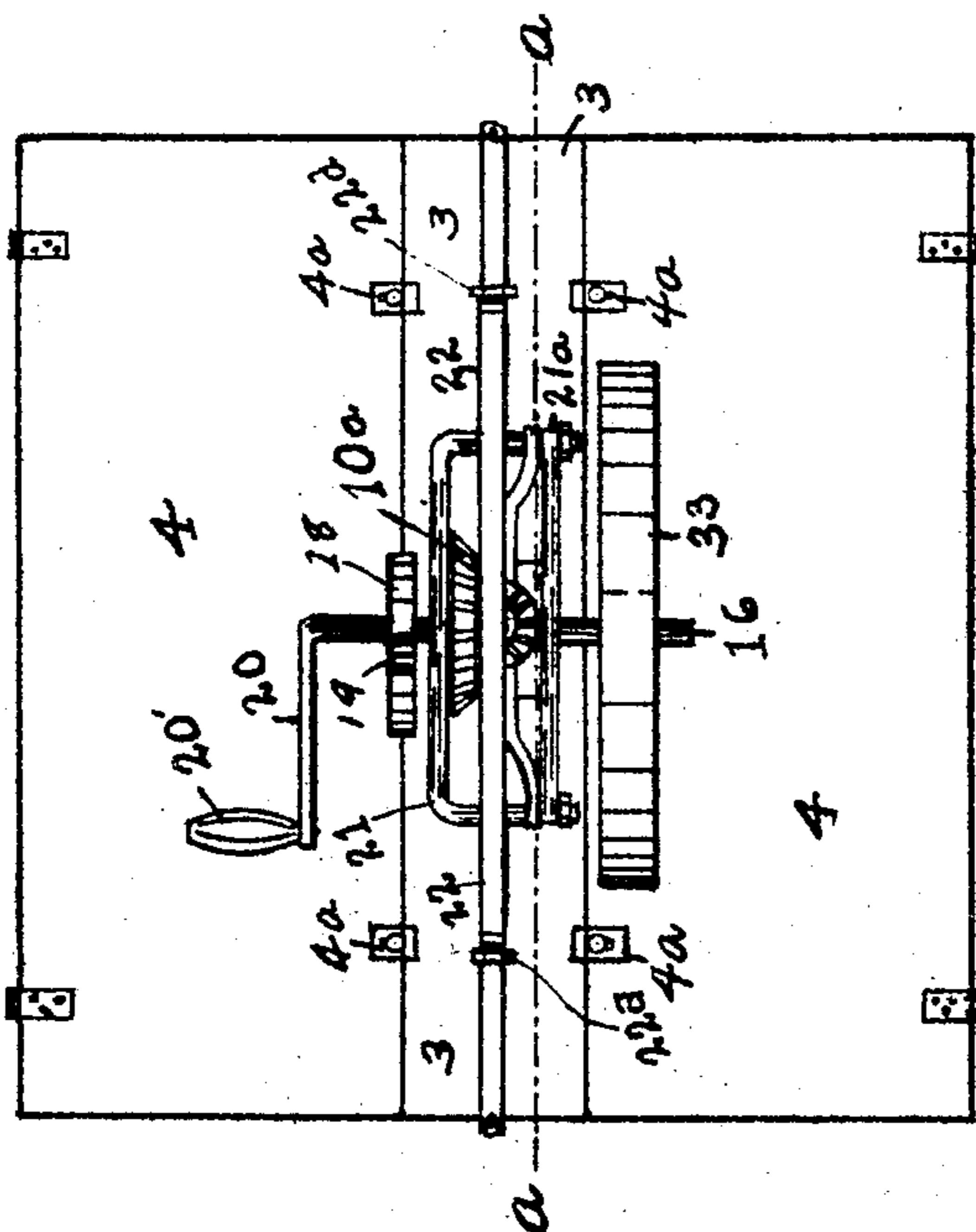


Fig. 2.

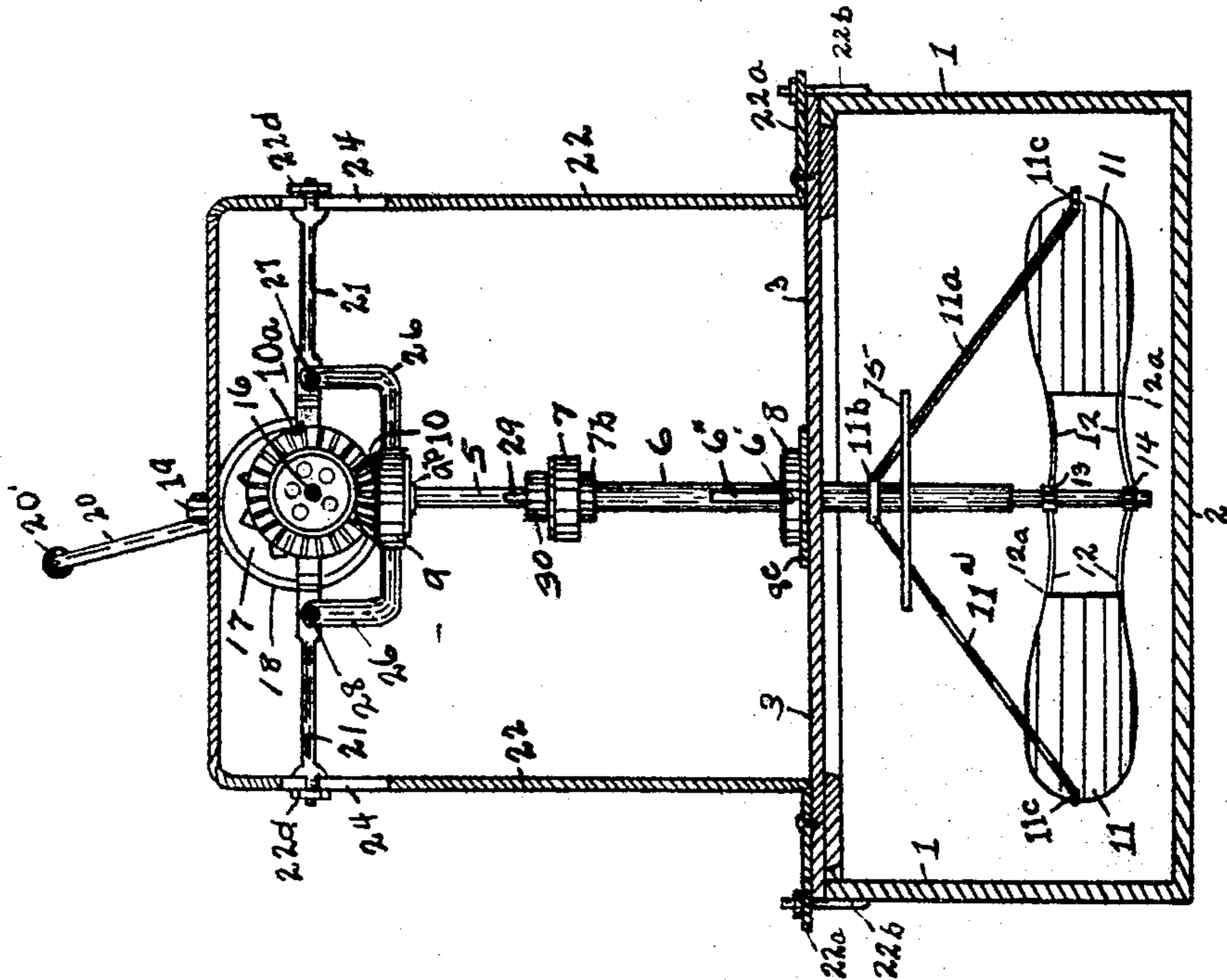
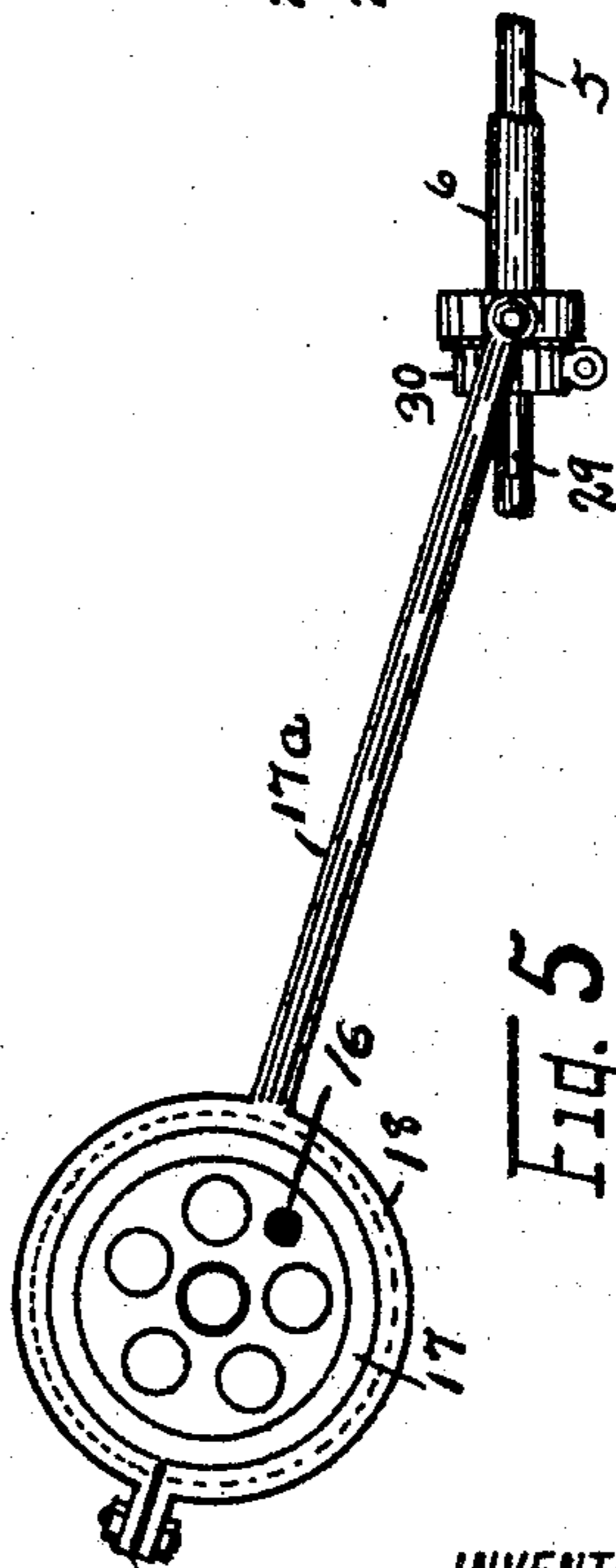


Fig. 5.



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2 SHEETS—SHEET 2.

Fig. 3.

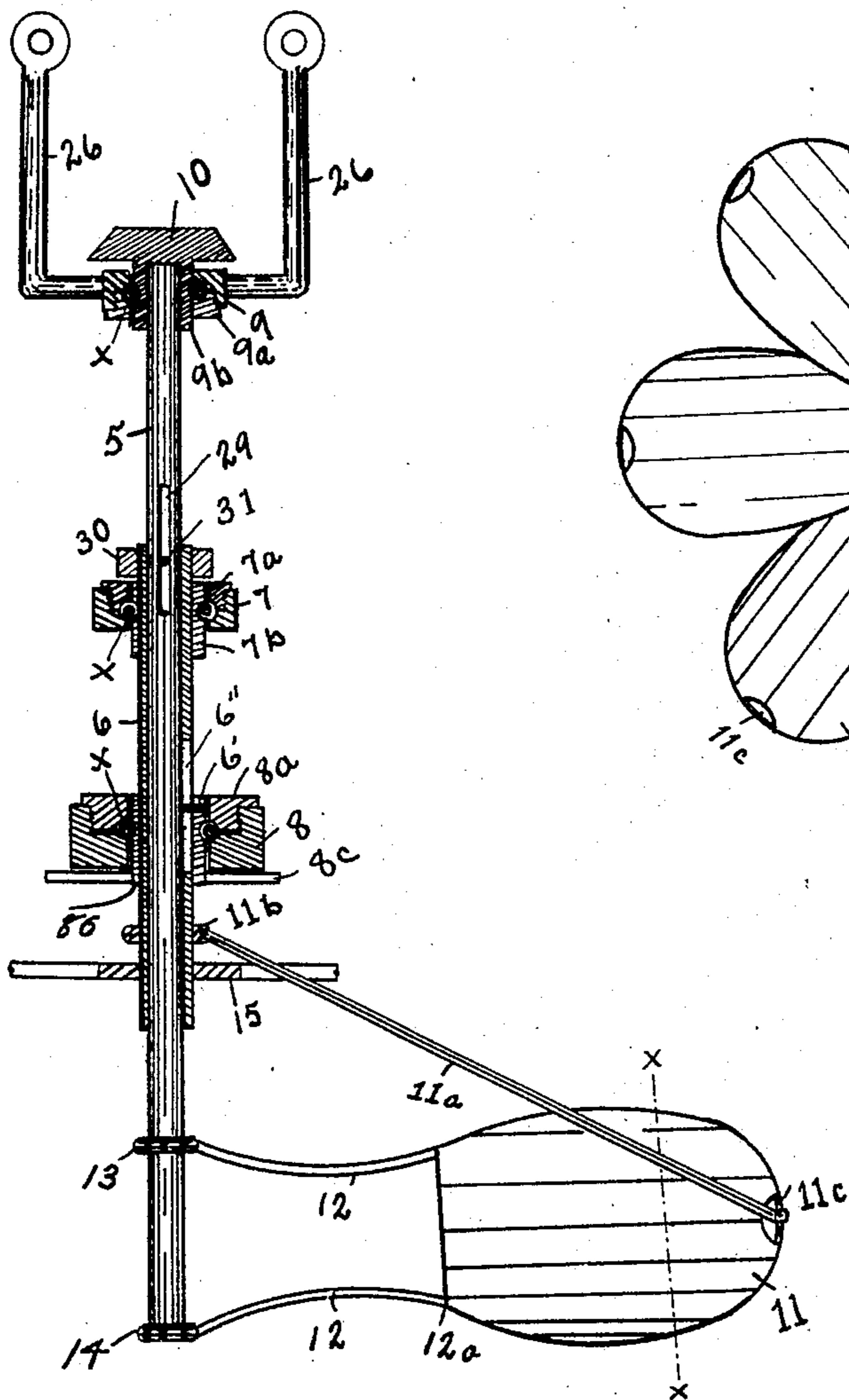


Fig. 4.

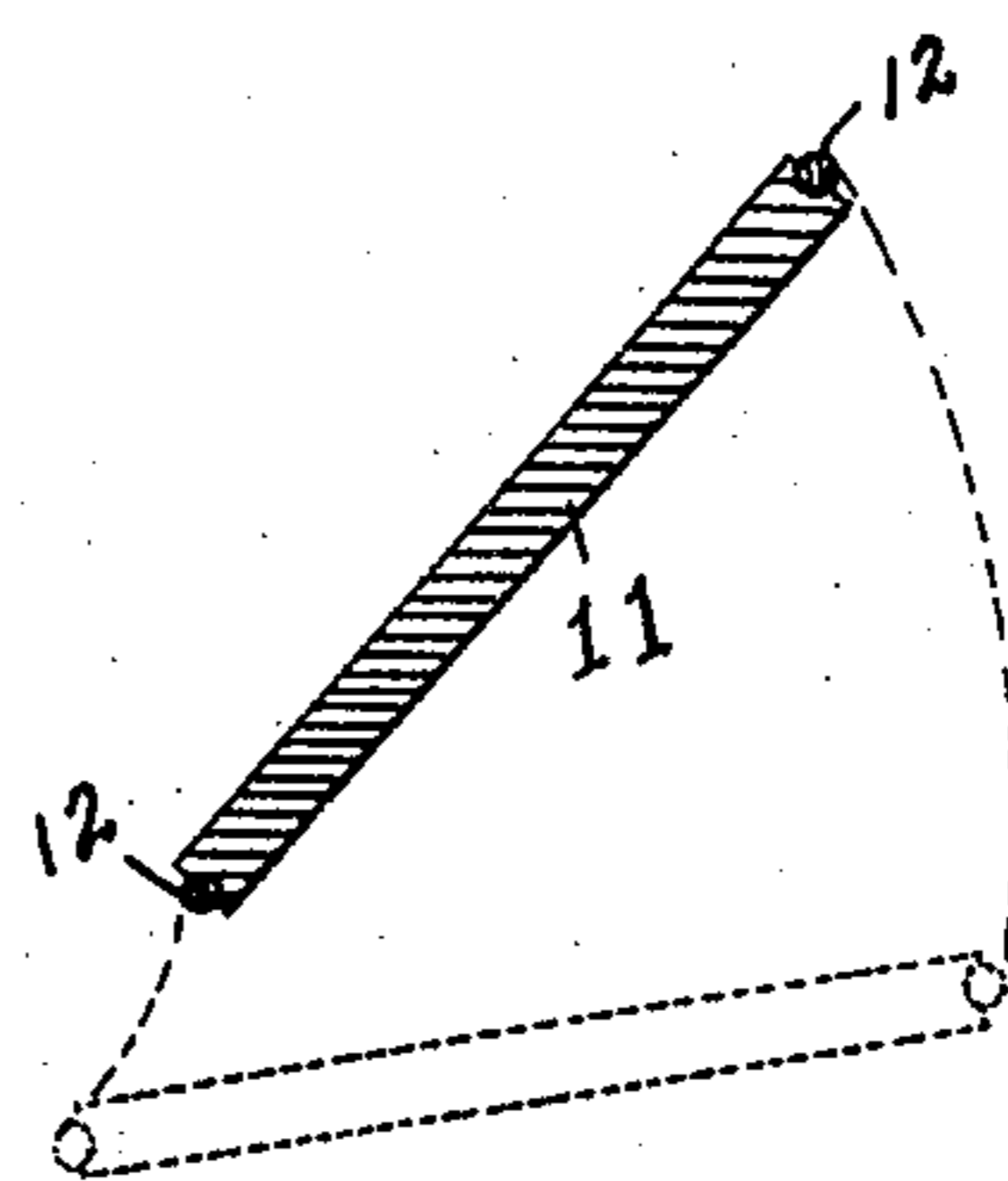
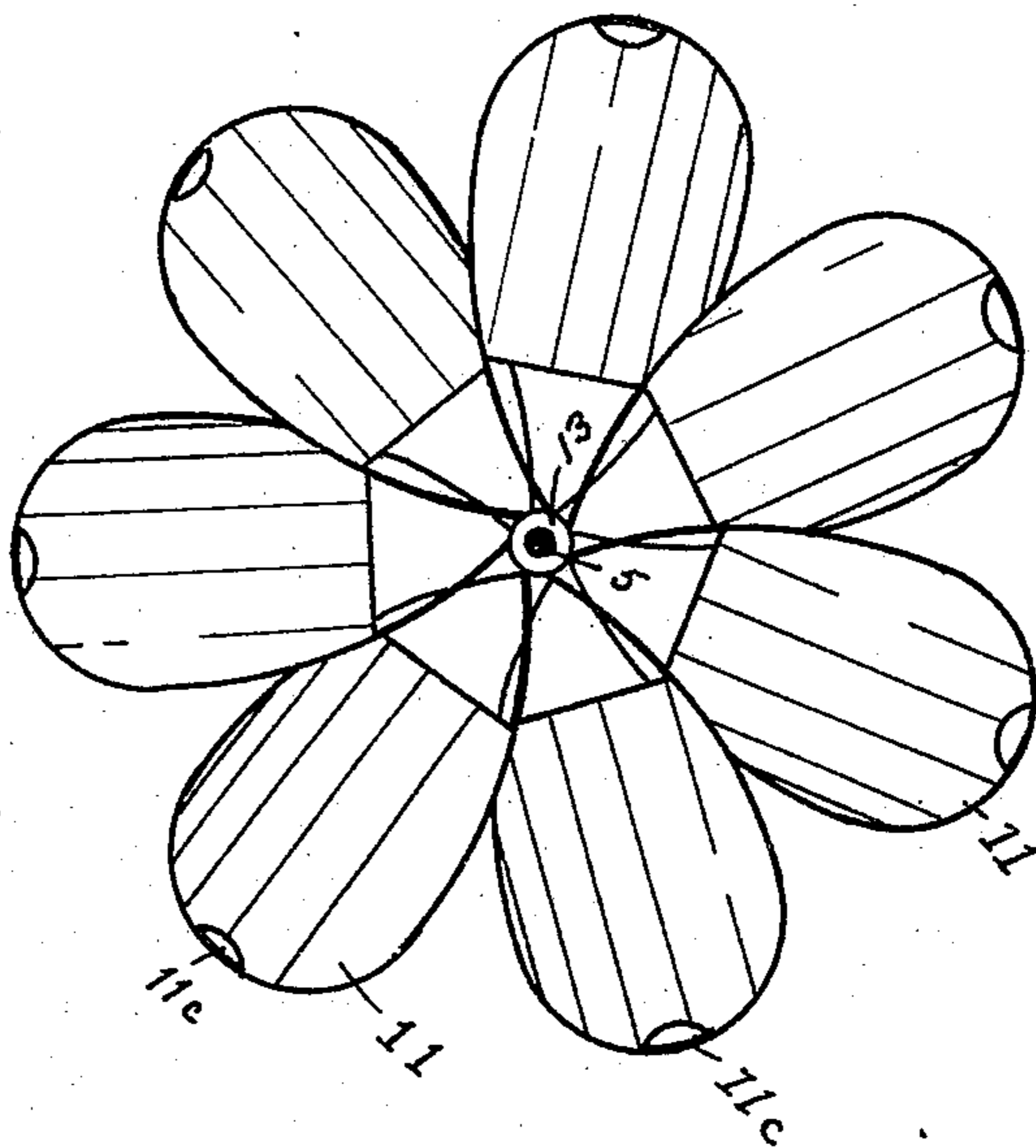
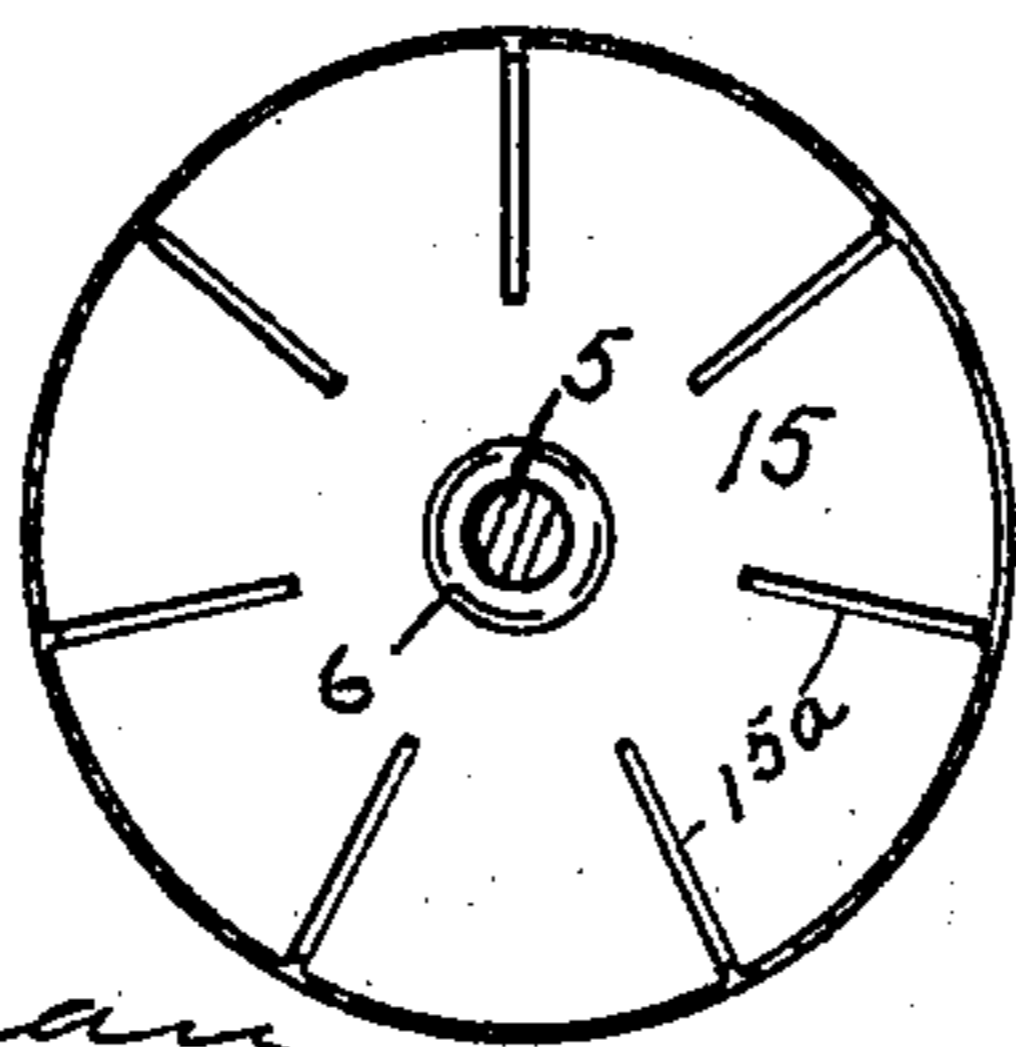


Fig 6.

Fig. 7.



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CHURN.

SPECIFICATION forming part of Letters Patent No. 764,846, dated July 12, 1904.

Application filed March 21, 1904. Serial No. 199,104. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH HIRSCHENFELD, a citizen of the United States, residing at Colorado Springs, in the county of El Paso and State of Colorado, have invented certain new and useful Improvements in Churns, of which the following is a specification.

My invention relates to an improvement in churns in which the cream is agitated by means of a convenient number of revolving paddles. I also impart to these revolving paddles a vertical motion by means of the mechanism herein described.

In the accompanying drawings, Figure 1 is a top plan view of my churn. Fig. 2 is a vertical section taken on the line *a a* in Fig. 1. Fig. 3 is also a vertical section and illustrates the detailed construction of the revolving shaft and bearings. Fig. 4 is a top plan view of a series of paddles which form a paddle-wheel. Fig. 5 is a detailed view of eccentric and connections. Fig. 6 is a section of one of the paddles and the dotted lines therein show the motion of the paddles as viewed from the end. Fig. 7 is a view of the slotted guide-wheel used to strengthen the connecting-rods between the paddles and the shaft, as shown.

In all of the figures corresponding parts are indicated by the same characters in the several views.

Referring to the details of construction, 1 1 are the sides of the churn, of which 2 is the bottom.

3 is a removable strip forming a part of the top of the churn, to which is fastened all of the exterior and interior mechanism used on and in the churn. The strip 3 is readily removable and, together with all connected parts, may be lifted out of and away from the churn. For holding it in place it has on each end the fastenings 22^a with openings in them corresponding to the bolts 22^b, which bolts are designed to have ordinary nuts threaded on them or, if preferable, ones suitable for hand use.

4 4 are hinged lids on the top of the churn, fitted to the center piece 3 and, with it, completely covering the churn. These lids have

each two fastenings, (designated as 4^a in the drawings,) which fastenings may be either spring-catches or slide-bolts.

5 is the main shaft of the propelling mechanism, and this shaft simply revolves.

6 is an outer casing fitted over the shaft 5, and by means of the pin 31 in the slot 29 it is compelled to revolve with shaft 5; but the outer shaft 6 has independent of the shaft 5 a vertical motion imparted to it by means of the eccentric 17 and eccentric-rod 17^a, connected with a bolt or pivot attached to the bearing 7.

7 is a ball-bearing consisting of three members, as shown, the principal one having the pivot or bolts on the outside for connecting with the eccentric, as described. In action it forms a loose collar in which the shaft 6 may revolve freely and also imparting to it the vertical motion.

8 is a three-member bearing fastened by means of the plate 8^c to the top of the churn. In this bearing 8^a is a threaded cone adapted to be screwed into the receptacle 8.

8^b is a loose collar on the outside of the shaft 6, which will allow the shaft to be raised and lowered; but by means of the pivot 6' in the slot 6'' the collar is compelled to revolve with the shaft. The slot 6'' extends only through the outer casing 6 and is cut much longer than stroke of the eccentric to allow adjustment of the interior mechanism in the slots 24, as hereinafter described.

In all of the figures *x* indicates the balls in the bearings.

7^b is a collar in the bearing 7, similar to the collar 8^b, just described, but solidly connected with the shaft 6 and revolving with it.

30 is a clamp around the upper end of the casing 6, and the pivot 31 after passing through the slot of 29 is fastened at both ends in the casing and in the said clamp 30.

The bearing 9 is similarly constructed to the bearings 7 and 8, but inverted. The collar 9^b forms a part of the pivotal gear-wheel 10 and is also permanently and solidly fastened to the upper end of the shaft 5. 9^a and 7^a are constructed like 8^a, heretofore described.

26 26 are arms connecting the bearing 9, which supports the cog-wheel 10 with the movable guide 21.

10 is a bevel gear-wheel the teeth of which engage those of the gear-wheel 10^a. This gear-wheel is attached to the power-shaft 16, to which is also attached the eccentric wheel 17.

18 is a collar encircling eccentric 17 and in order to be placed on the eccentric is jointed at 19. To this collar 18 is attached the eccentric-shaft 17^a, before referred to.

20 is a handle attached to the shaft 16 and having on the end of it the grip 20', adapting the machine to be operated by hand.

To adapt the machine for use with transmitted power, it would only be necessary to extend the shaft 16 and place thereon a pulley-wheel, omitting the handle 20.

21, before referred to, is an adjustable support, having in it one of the bearings in which the shaft 16 operates, and attached to it is the plate 21^a, with a suitable aperture which forms the second bearing for the shaft 16. The ends of the shaft 21 are adapted to be moved in the slots 24 24 in the standard 22. The nuts 22^d on the ends of the support 21 on the outside of the standards 22 prevent the standards from bulging out and also allow the support when the nuts are loosened to be raised or lowered. By means of this arrangement the height of the paddles in the churn may be adjusted to suit operator without any change in the bearings. When the nuts 22^d are screwed up tight, the support is held solidly in place.

27 and 28 are bolts connecting the carrier 21 with the arms 26 and the cross-piece 21^a.

The paddles 11 are encircled by the flexible metallic bands 12, which bands after passing around the paddles are connected by collars 13 and 14 to shaft 5. These bands are also suitably connected with each other at the point 12^a. The bands may be made either round or square and shall be let into the edges of the paddles by means of grooves and fastened there by means of screws, nails, or binding-wire. The ends of paddles 11 are connected with the shaft 6 by means of the rods 11^a, attached to the paddles at the points 11^c and to the shaft 6 by means of a collar 11^b. These rods pass through the slots 15^a in the wheel 15, and the wheel 15 serves to relieve the strain on the bearing in the collar 11^b.

33 is a fly-wheel the momentum of which aids in the operation of the churn.

It will be seen from the foregoing descriptions that as the handle 20 is revolved, turning with it the gear-wheels 10^a and 10 and eccentric 17, the revolving of the gear-wheels caused thereby will revolve the shafts 5 and 6, while the eccentric raises or lowers the outer shaft 6. The outer shaft 6 being connected with the ends of the paddles will, if it is raised and lowered, produce a similar

motion in the ends of the paddles. The manner in which the paddles are attached to the shaft 5 by means of the bands 12 in the collars 13 and 14 will produce a tipping motion in the paddles. The motion produced in the paddles is very difficult to describe, but is partially shown in Fig. 6. The three motions produced by the revolving of the power-shaft 16 are the rotary, the vertical, and the tipping motion caused by the manner in which the paddles are attached. These three distinct motions very thoroughly agitate and aerate the contents of the churn and will in a very short time produce the desired result.

As illustrated in accompanying drawings, the churn has seven paddles; but this number is to be diminished or increased as the practical and economical use of the churn may prove desirable.

I do not desire to limit my churn to the precise construction shown or to a square churn. The mechanism may be readily attached to a round churn or to any other desirable shape.

If desired, an additional handle may be attached to the shaft 16 on the opposite side to the handle 20, and two persons may operate the churn.

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

1. In a churn the combination with the sides and bottom of the strip 3, the standards 22 attached to the strip 3, the shaft 5, the paddles 11 attached to the shaft 5 by means of bands 12, the bands 12 encircling the paddles 11, the shaft 6, the rods 11^a connecting the paddles 11 with the shaft 6, the ball-bearing 7 near the end of the shaft 6, the clamp 30 above the ball-bearing 7 at the end of the shaft 6, the ball-bearing 8 around the shaft 6, attached to the top of the strip 3, the ball-bearing 9 under the cog-wheel 10 in the support 26, the support 26 attached to the carrier 21, the carrier 21 fastened at either end to the standards 22, the cog-wheel 10, the pin 31 operating in the slot 29 and causing the shafts 5 and 6 to revolve together, the pin 6' operating in the slot 6'' causing the collar 8^b to revolve with the shaft 6, substantially as described and for the uses and purposes set forth.

2. In a churn the combination with the sides and bottom of the lids 4, 4, hinges and fastenings connecting the lids to the sides of the churn, the strip 3, the fastening which holds the strip 3 in place, the standards 22 attached to the strip 3, the adjustable support 21, the cross-plate 21^a on the carrier 21, furnishing additional strength and a bearing for the power-shaft 16, the power-shaft 16 extending through the carrier 21 and the plate 21^a and having on one end the fly-wheel 33, also having on it the eccentric 17 and the cog-wheel 10^a, the eccentric-collar 18 encircling the eccentric 17 and connected with the eccentric-shaft 17^a, the eccentric 17^a connected with the

bearing 7 by means of the bolt 17^b, the arms 26 supporting the bearing 9 and shaft 5, the bolts 27 and 28 connecting the arms 26 with the carrier 21, the shaft 5, the shaft 6 inclosing the shaft 5, the slot 29 in the shaft 5, the slot 6'' in the shaft 6, the pin 6' operating in the slot 6'', the pin 31 operating in the slot 29, the ball-bearing 9 connecting the shaft 5 with the supports 26 and furnishing bearing 10 for cog-wheel 10, the cog-wheels 10 and 10^a, the ball-bearing 7 connecting the eccentric-shaft 17^a with the shaft 6, the ball-bearing 8 on the strip 3 and through which the shafts 5 and 6 pass, the paddles 11 connected with the

shaft 5 by means of the bands 12, the rod 11^a 15 connecting the outer ends of the paddles with shaft 6, the slotted guide-wheel 15 on the shaft 6 having in it the slots 15^a through which the rods 11^a are intended to operate, all substantially as described and for the uses and purposes set forth. 20

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

JOSEPH HIRSCHENFELD.

Witnesses:

ARA B. PERRYMAN,
J. E. LITTLE.