

(No Model.)

M. S. BOWSER.
CHURN.

No. 350,524.

Patented Oct. 12, 1886.

Fig. 1.

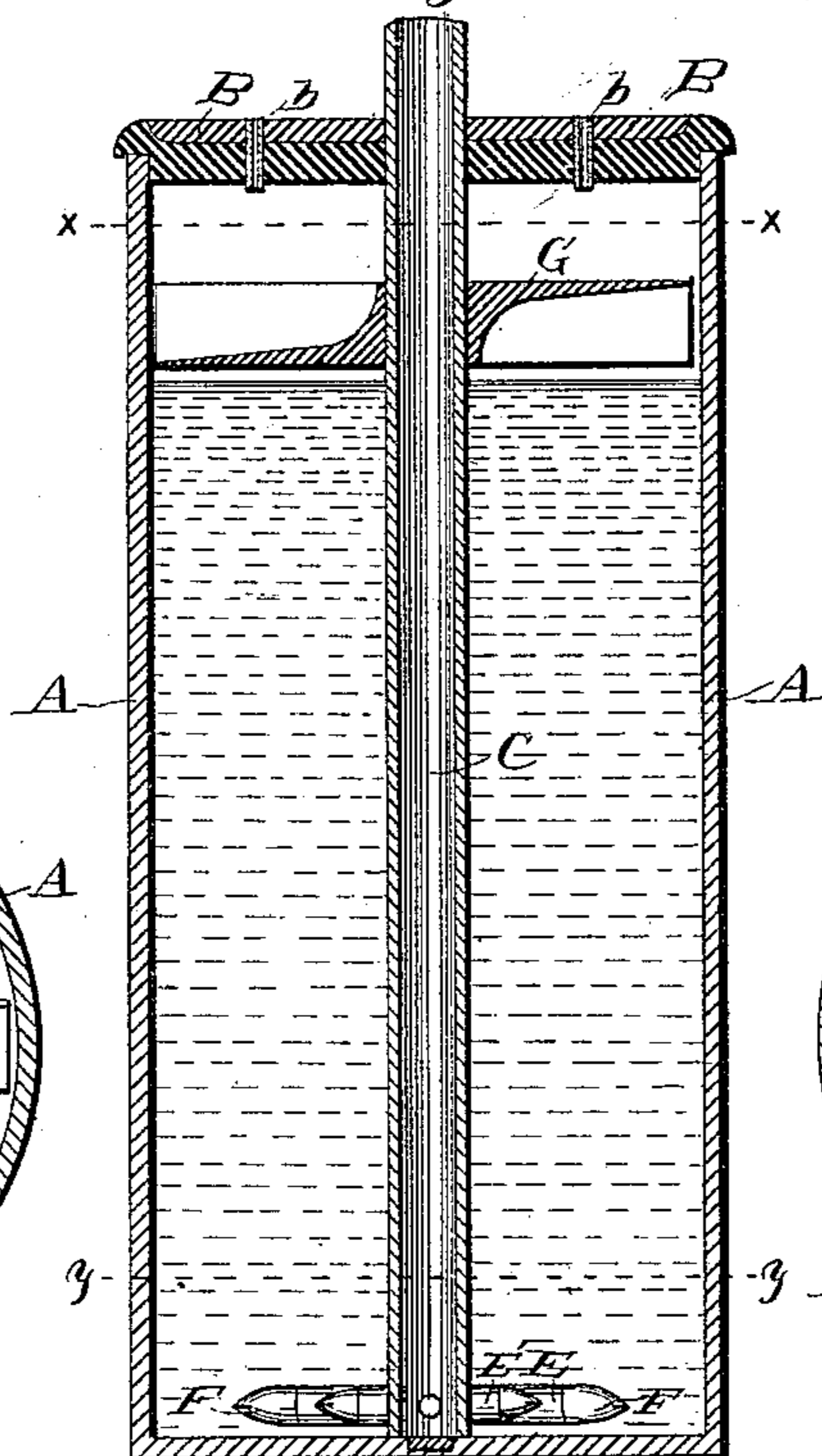


Fig. 2.

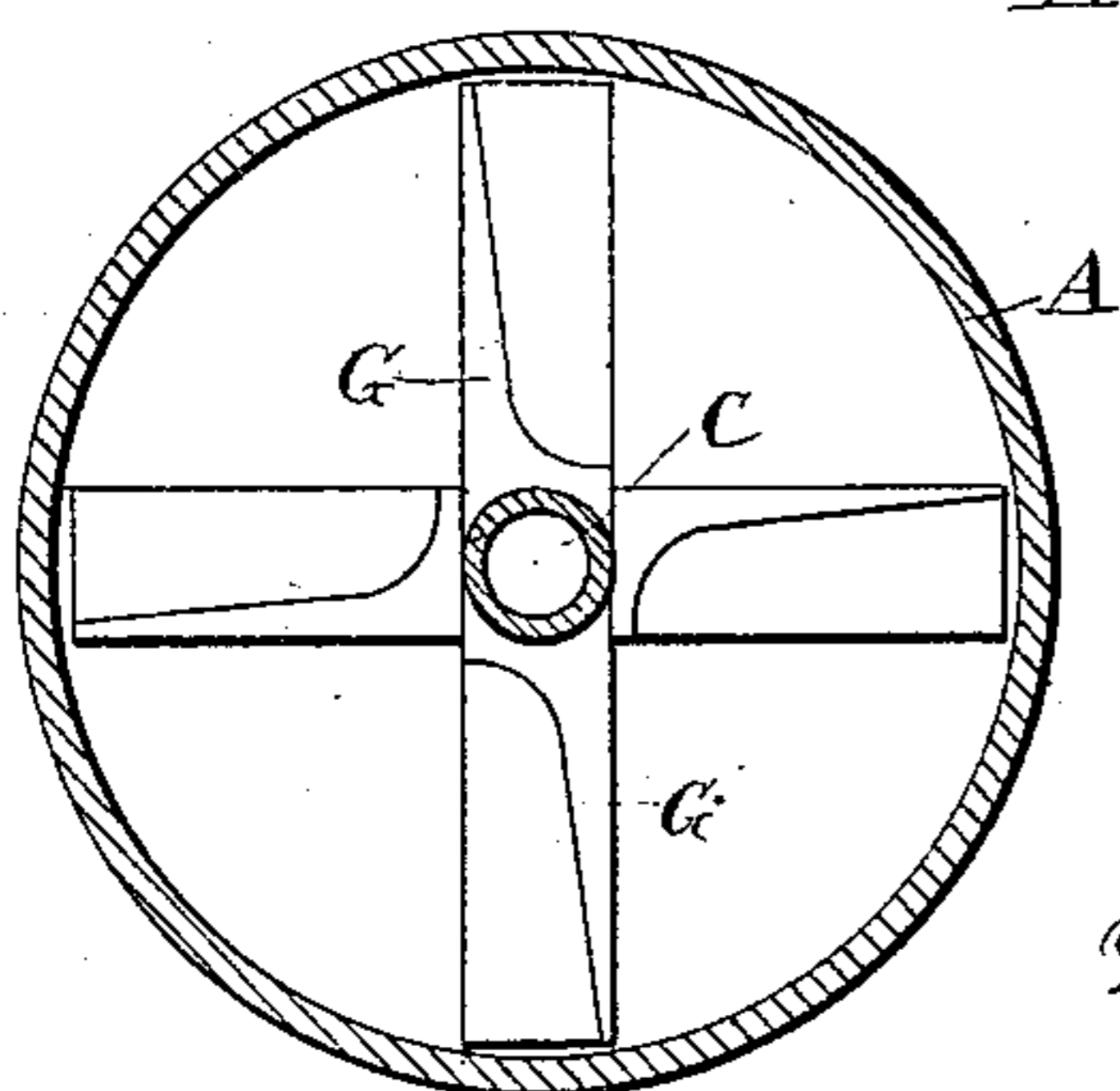


Fig. 3.

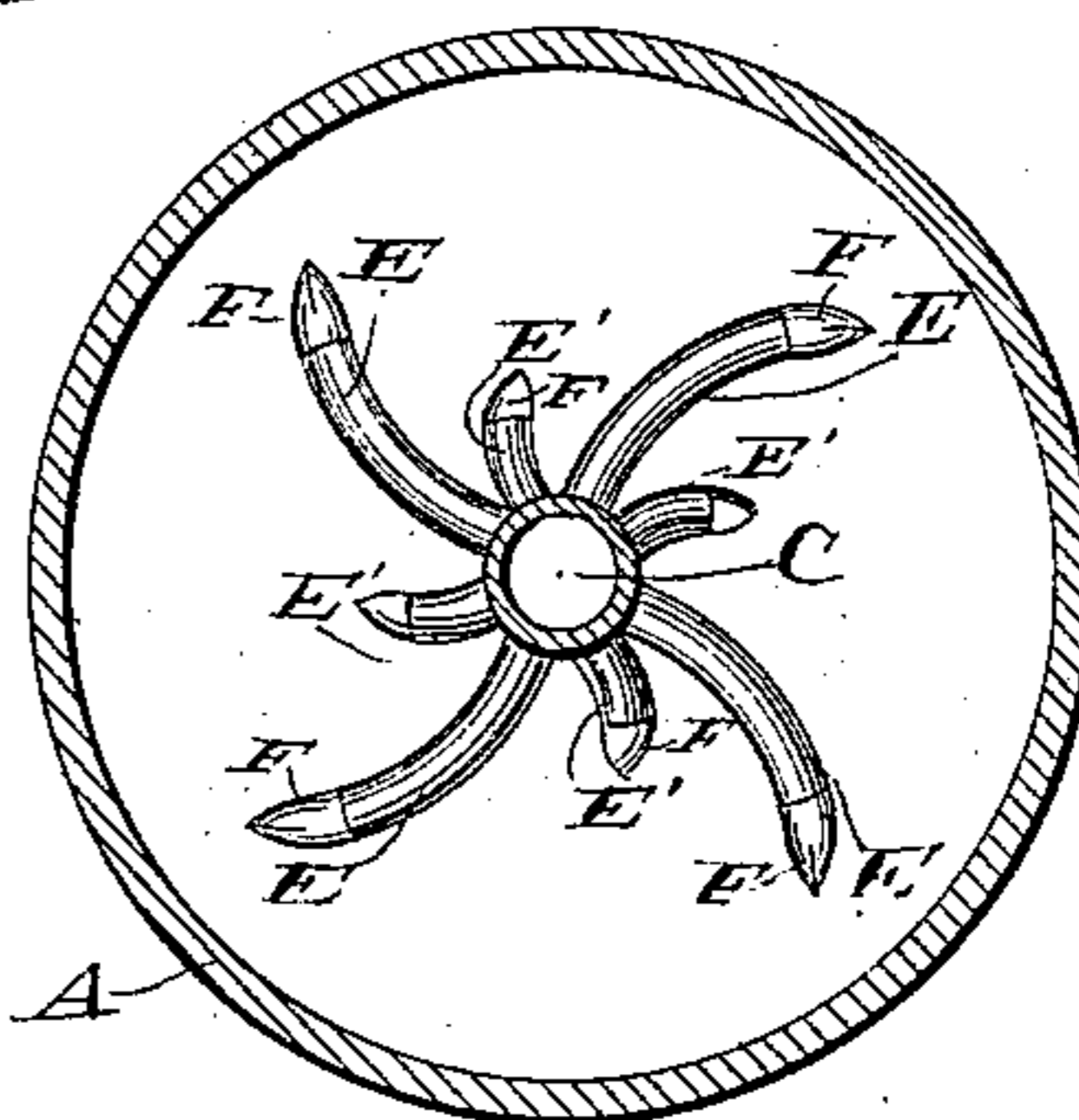


Fig. 4.

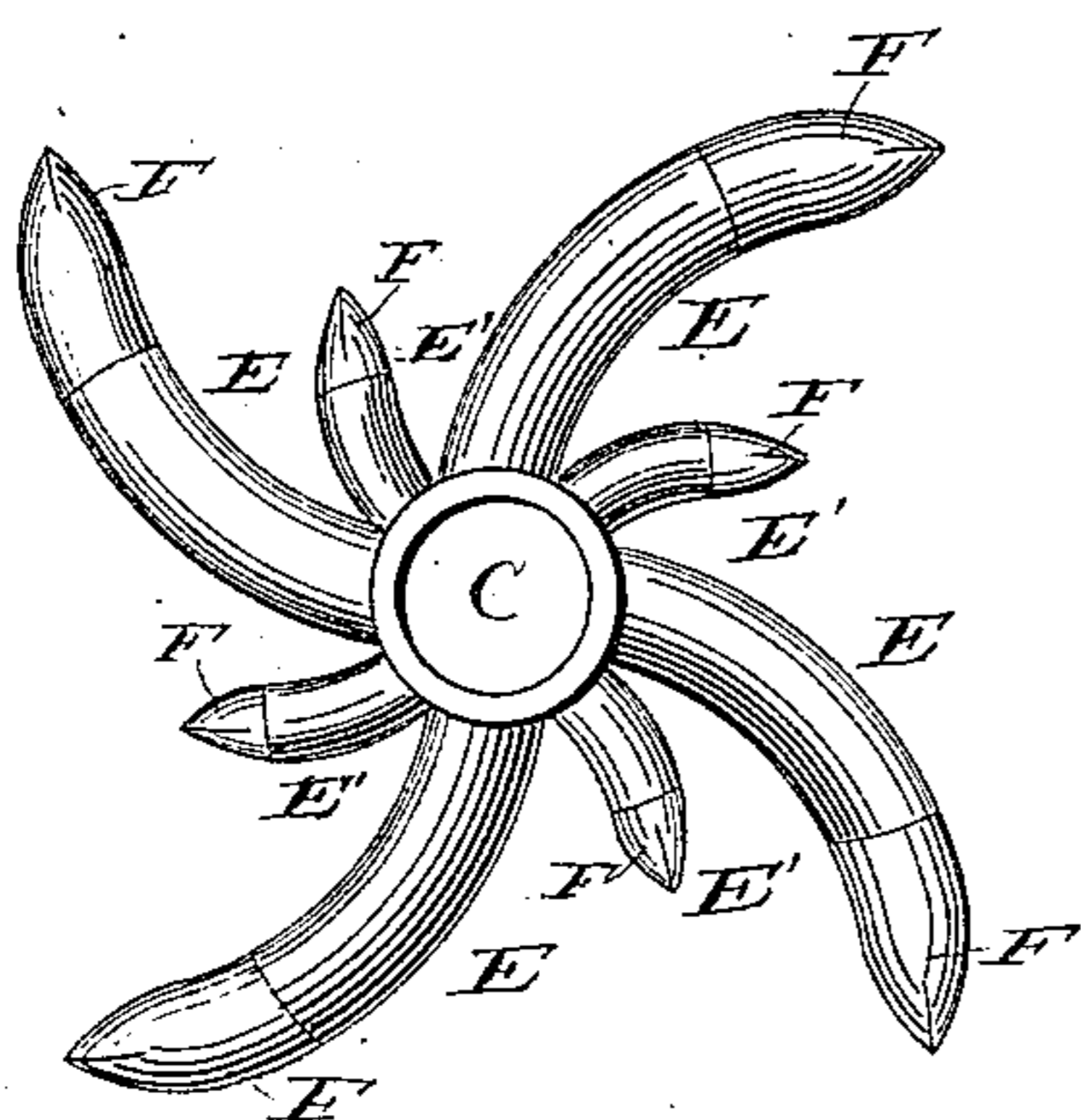
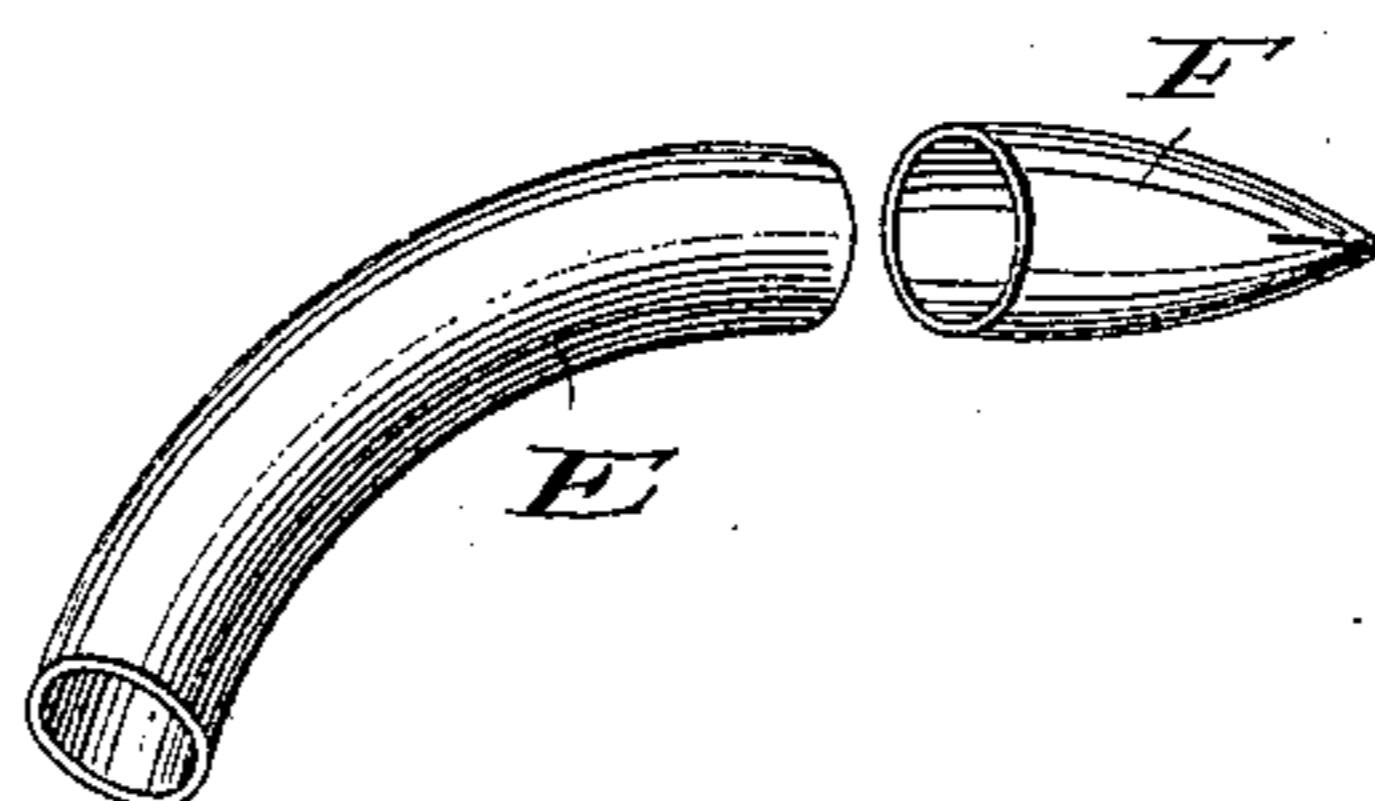


Fig. 5.



Witnesses

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MATTHIAS S. BOWSER, OF LIMA, OHIO.

CHURN.

SPECIFICATION forming part of Letters Patent No. 350,524, dated October 12, 1886.

Application filed October 17, 1884. Serial No. 145,794. (No model.)

To all whom it may concern:

Be it known that I, MATTHIAS S. BOWSER, a citizen of the United States, residing at Lima, in the county of Allen and State of Ohio, have invented certain new and useful Improvements in Churns, of which the following is a specification.

My present invention relates to improvements in churns of that class known to the art as "atmospheric" churns; and it consists of the peculiar combination and novel construction and arrangement of the various parts for service, substantially as hereinafter fully set forth, and particularly pointed out in the claims.

My invention has for its objects to provide improved means to distribute atmospheric air in the body of cream in proper quantities, while imparting or creating a violent agitating or whirling movement, to facilitate the operation of churning, and to provide an improved rotary device for gathering the particles of butter which are released from the cream by the agitation thereof and rise to the top, the said device being so arranged that the particles of butter gathered thereby are kept from foaming or whirling cream and milk.

A further object of my invention is to provide the churn with ventilating-tubes, so that all noxious odors or gases will escape freely during the operation of churning, and, finally, to improve the device in minor details, so that it will be very easily and readily cleaned, simple and durable in construction, and cheap of manufacture.

In the accompanying drawings, which illustrate a churn embodying my invention, Figure 1 is a vertical central sectional view through the churn-body, with the dasher in elevation. Figs. 2 and 3 are horizontal sectional views on the lines *x x* and *y y* of Fig. 1, respectively. Fig. 4 is an enlarged detail view of the dasher detached from the churn-body; and Fig. 5 is a similar view of one of the distributing-arms, with its nipple or valve.

Referring to the drawings, in which like letters of reference denote corresponding parts in all the figures, A designates the body of the churn, which is of any desired form and size. This body has a removable cover, B,

which is detachably fitted on the upper edges of the vessel, and through openings in this cover are passed vertical ventilating-tubes *b*, of suitable diameter and length to permit the noxious gases and air to escape from the body or vessel when the operation of churning is in progress, and thus ventilate the body.

C designates a tubular shaft, which passes centrally through the body or vessel and the cover B therefor. The upper end of the shaft is left open to permit the air to pass freely therein, and the lower end of the shaft bears or is stepped in a suitable bearing at the bottom of the body to steady the same. This shaft is rotated in a vertical plane by any preferred or suitable gearing or mechanism to draw atmospheric air into the same and discharge it through distributing pipes or tubes E E' into the cream in the body or vessel A, at the lower end thereof. These tubes E E' form the churn-dasher to create a violent whirling agitation among the particles of the cream; and the tubes are suitably affixed at their inner ends to the shaft C, so that their passages are in communication with the chamber of the shaft to conduct and discharge the air from the shaft into the cream. The tubes are arranged on the tubular shaft near the lower end thereof, so as to be out of contact with the churn body or vessel, and the tubes radiate or project outwardly from the shaft a sufficient distance, their free ends terminating out of contact with the churn-body. The distributing-tubes are curved longitudinally, as shown, and arranged in the same plane, and the tubes E' are shorter than the tubes E and arranged between the latter, to discharge the air conveyed by the shaft C nearer to the center of the churn-body, the longer tubes, E, discharging the air into the cream near the sides of the body of the churn, and the shorter tubes near the center of the churn, and thus more effectually distribute the air. Each of these distributing-pipes is provided with a nipple or cap, F, which serves as a valve to exclude cream from the distributing-pipes when the apparatus is at rest, and which also serves to permit the free escape of the air when the dasher is in motion. This nipple is made of a suitable flexible material—

as, for instance, vulcanized rubber—and it is made tapering toward one end. The enlarged end of the flexible nipple is left open, so that it can be very easily and readily fitted on the free end of the tube, which it embraces very tightly to prevent it from accidental displacement, and the opposite or reduced end of the nipple has a longitudinal incision, which permits the escape of air when the dasher rotates. The nipple is closed by the pressure of the cream thereon, so as to exclude the same when the dasher is at rest; but when the dasher and the tubular shaft are set in motion the air is drawn into the shaft and the distributing-tubes, and is forced through the said incision of the nipples and into the cream, as will be readily understood. It will thus be seen that the dasher creates a very violent whirling agitation among the particles of the cream, and simultaneously discharges or forces atmospheric air through the tubes and nipples into the cream at the outer sides and center thereof, whereby the separation of the particles of butter and the operation of churning are facilitated to a very material extent.

G designates the rotary butter-gatherer, which is rigidly affixed or clamped in any suitable manner on the tubular shaft C, at an elevation a little above the line of the cream, so as to gather the particles of butter which rise to the top of the cream when churning. This butter-gatherer rotates simultaneously with the tubular shaft by which it is carried, and it consists of a number of radial arms, G, which are suitably secured together, each of the arms being cut away or recessed on one of its side edges to present sharp cutting-edges, which strike and pass through the cream freely when the butter-gatherer is rotated.

The operation of my invention will be readily understood from the foregoing description, taken in connection with the drawings. When the tubular shaft is rotated, atmospheric air is drawn into the same and discharged through the dasher-tubes into the cream, and the dasher agitates the cream and creates a whirling action among its particles. The particles of butter are separated by the dasher and rise to the top, where they adhere to and are gathered by the rotary butter-gatherer, which elevates them out of the cream, the said gatherer rotating with the shaft A. All noxious gases or odors escape through the ventilating-tubes b in the cover.

To clean the dasher, water is forced through the tubular shaft, when it is at rest or removed from the churn, and passes through the distributing-pipes and the opening in the nipples.

The nipples are easily removed when desired, and the device can be cleaned of any matter that may adhere to its interior.

I am aware that it is not new to provide a churn with a vertical tubular dasher-staff which is rotated very rapidly by suitable driving mechanism to draw in atmospheric air and

discharge the same at its lower end into the body of the cream by means of horizontal hollow dasher-blades, which are made either straight or curved and discharge the air at their outer open ends through transverse perforations, or through a perforated nozzle of rigid unyielding material at its outer end, and this feature I disclaim, broadly.

I am also aware that it is not new to support various forms of dasher blades on the hollow blades and the shaft.

I am further aware that it is not new to provide a churn with a butter-gatherer which rests on the top of the cream or contents of the churn-vessel and is entirely independent of the dasher-staff, and thereby partakes of the nature of a float.

I am also aware of the device shown in the Patent No. 116,855, in which a vertical tubular shaft carries two independent dashers near its middle and lower ends, which are connected by vertically-disposed spiral dasher-blades, and the shaft is further provided with radial air-tubes, which communicate with the tubular staff.

My invention differs from the devices hereinbefore referred to, in that I provide the tubular dasher-staff with horizontal distributing-tubes, which are arranged at the lower end of the shaft in the same horizontal plane, and these tubes are of unequal length, to discharge the air into the body of the cream at the outer sides and middle thereof. Each of these distributing-tubes is provided with a nipple of flexible material, which is tapered and provided with a longitudinal incision, and these flexible nipples serve as valves to prevent the entrance of cream and other matter to the tubes when the dasher-staff is at rest, while they permit the free escape of the air from the dasher-staff when it is in motion.

My invention also differs from the devices hereinbefore referred to, in that I affix a rotary butter-gatherer of peculiar construction to the tubular dasher-staff at a point thereon on the line of the cream, whereby the gatherer is positively rotated, and thereby accumulates the particles of butter more rapidly.

Having thus described my invention, I claim—

1. In a churn, the combination of a tubular shaft having an inlet-opening for the air, the dasher consisting of the radial distributing-tubes carried by the shaft and in communication therewith, and the nipples provided with the outlet-openings, fitted on the free ends of the distributing-tubes, substantially as described.

2. In a churn, the combination of a tubular shaft, the radial distributing-tubes carried by the shaft and in communication therewith, and a flexible tapered nipple detachably fitted upon the free end of each distributing-tube, and having a longitudinal incision at its contracted end, substantially as described.

3. In a churn, the combination of a tubular

shaft, the radial curved tubes E E', carried by the shaft near its lower end and opening into the same, the tubes being made of different lengths, and the shorter tubes being arranged
5 between the longer tubes, and the tapered flexible nipples fitted on the free end of each tube, and having a longitudinal incision, substantially as described.

4. In a churn, the combination of a tubular
10 shaft, the distributing-tubes carried thereby near its lower end, the flexible nipples fitted on the free ends of the tubes, and each having an opening, and a butter-gatherer carried by the shaft above the tubes and rotating there-
15 with, said gatherer having the radial recessed arms, substantially as described.

5. In a churn, the body provided with a removable cover having the ventilating tubes, in combination with a tubular shaft, the distributing-tubes carried thereby near its lower
20 end, the flexible nipples fitted on the free ends of the tubes, and a butter-gatherer, also carried by the shaft above the tubes, substantially as described, and for the purpose set forth.

In testimony whereof I have hereunto subscribed my name, in the presence of two witnesses, this 14th day of October, 1884.

MATTHIAS S. BOWSER.

Witnesses:

J. C. WINEGARDNER,
JOHN ROUSH.