

(No Model.)

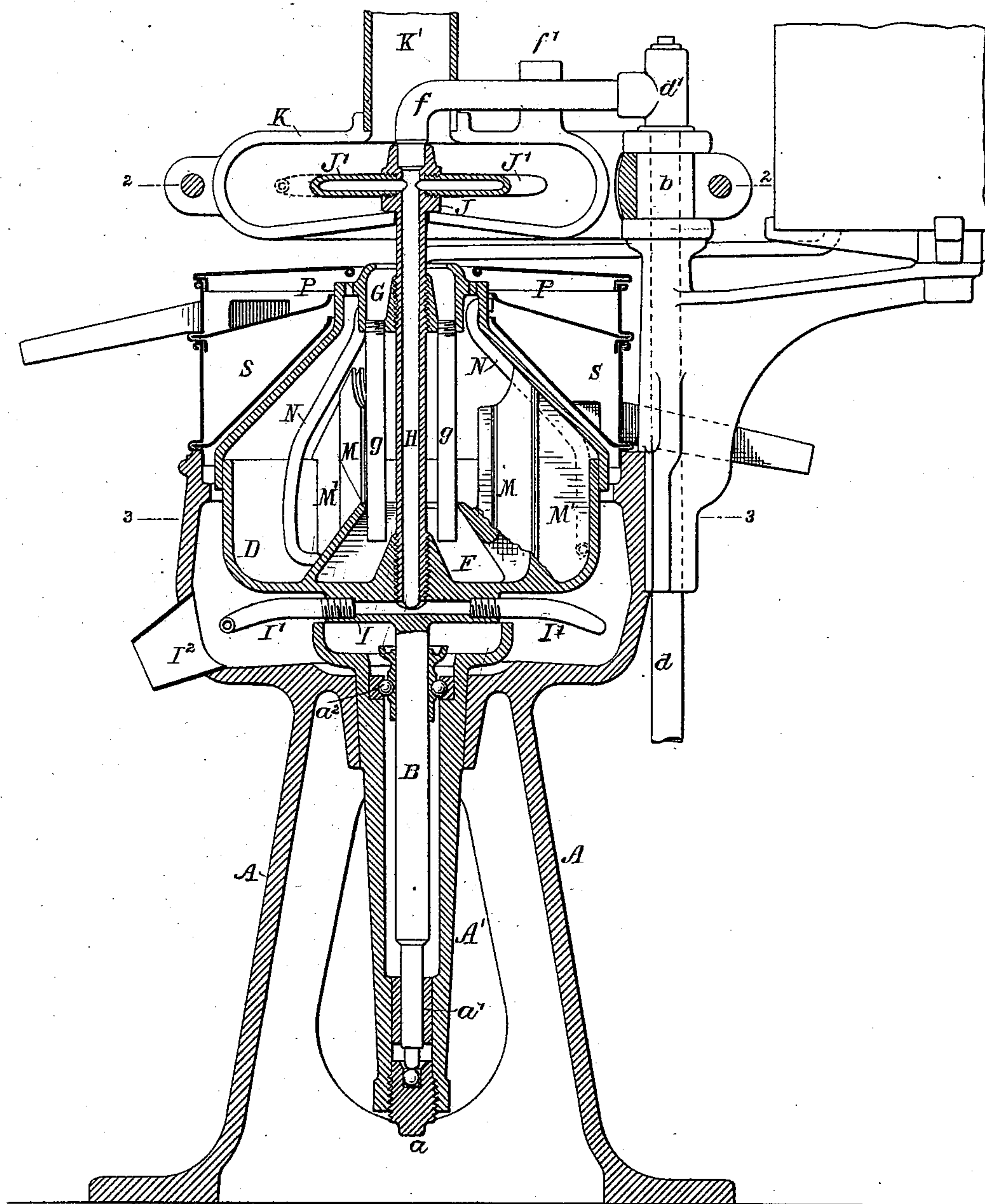
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W. C. HARTMANN.
CENTRIFUGAL SEPARATOR.

No. 561,050.

Patented May 26, 1896.

FIG. 1.



Witnesses:
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Frank E. Bechtold

Inventor:
William C. Hartmann
By his Attorneys
Hewitt & Hewitt

(No Model.)

2 Sheets—Sheet 2.

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FIG. 2.

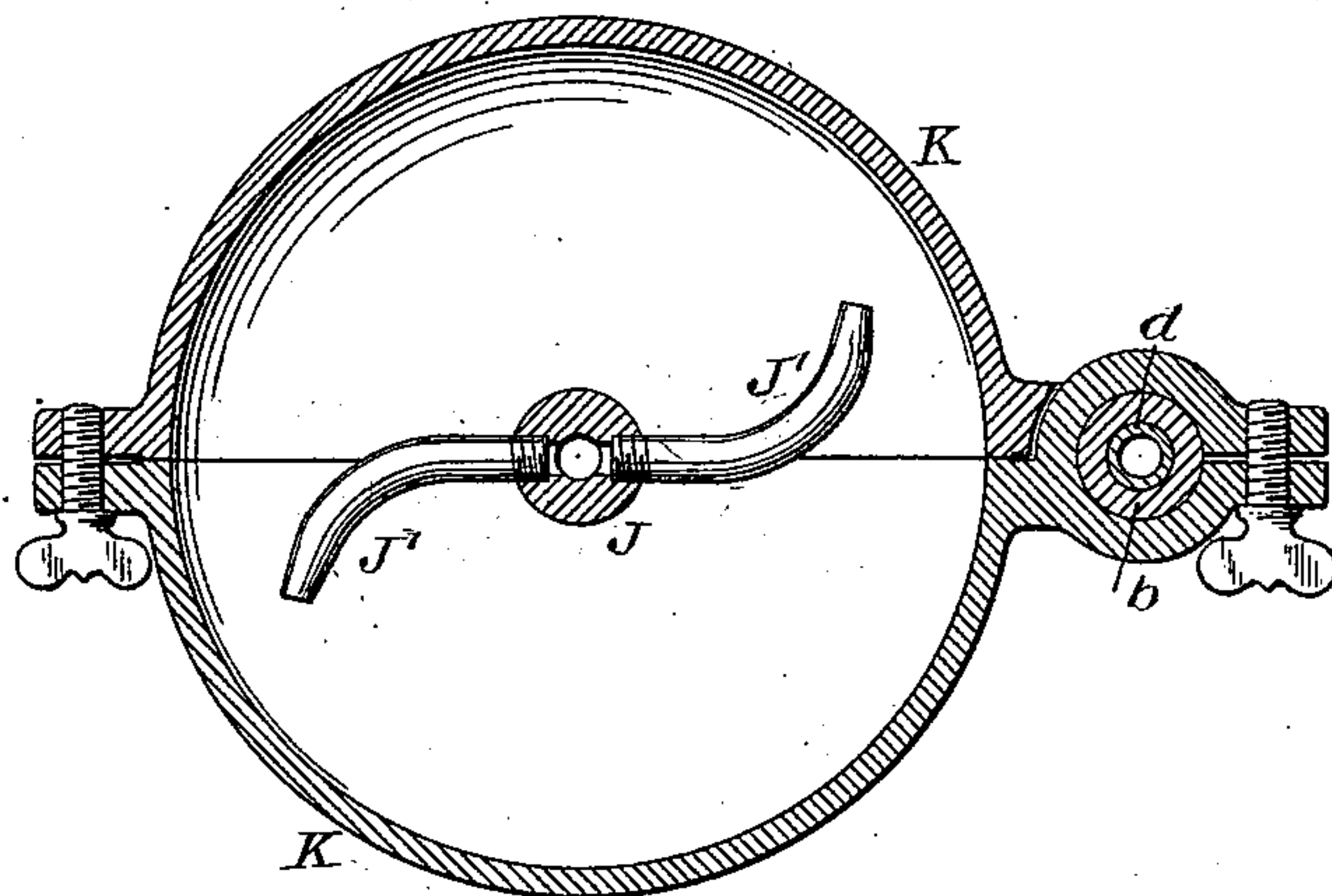
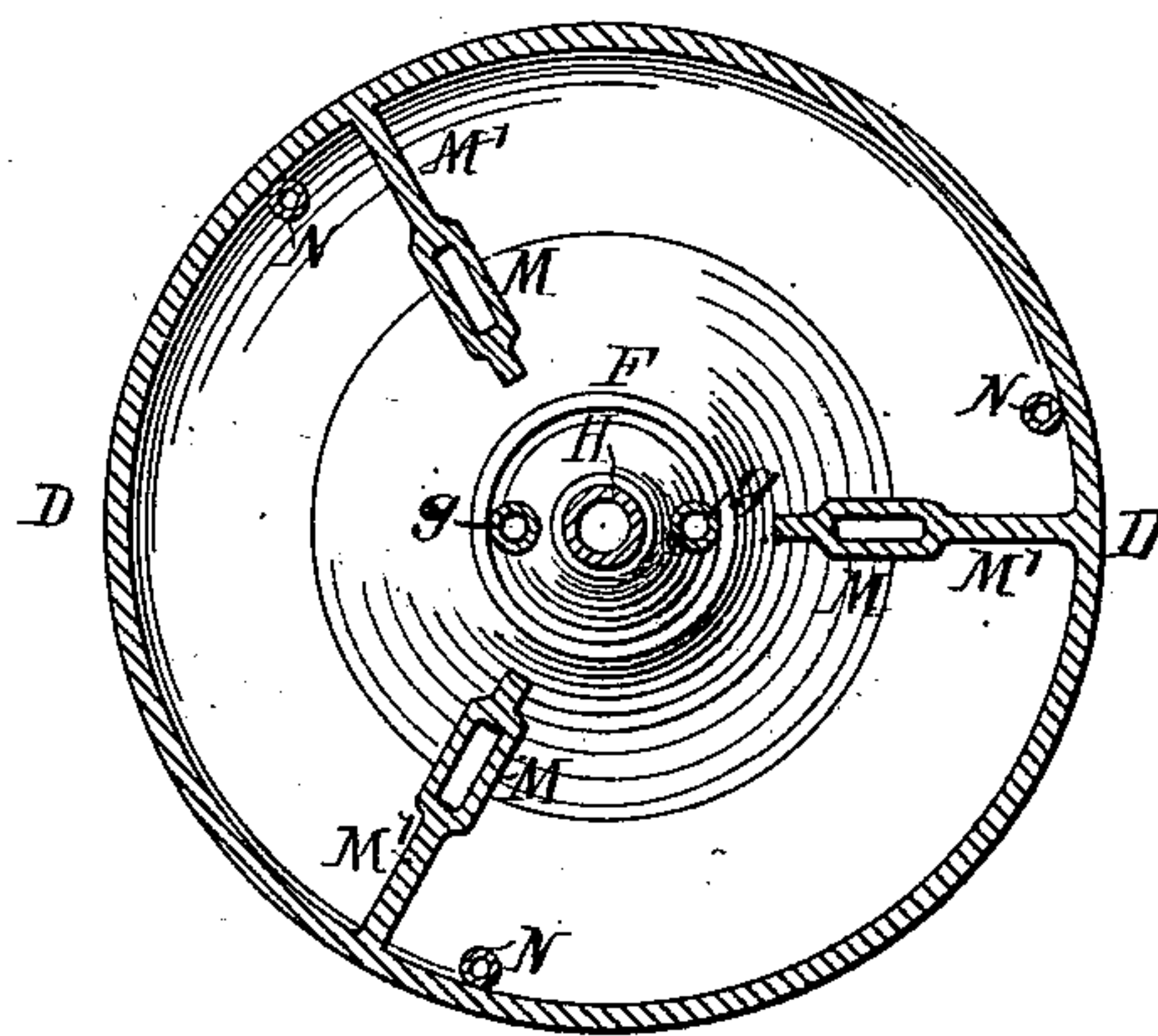


FIG. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM C. HARTMANN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR
TO THE KEYSTONE CREAM SEPARATOR COMPANY, LIMITED, OF SAME
PLACE.

CENTRIFUGAL SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 561,050, dated May 26, 1896.

Application filed July 9, 1894. Serial No. 516,976. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM C. HARTMANN, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Centrifugal Separators, of which the following is a specification.

One object of my invention is to provide efficient means whereby the separator-bowl can be driven by means of compressed air, water, steam, or other fluid under pressure, a further object being to effect more thorough separation of the cream from the milk than in centrifugal separators as usually constructed. These objects I attain in the manner herein-
after set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal section of a centrifugal cream-separator constructed according to my invention. Fig. 2 is a sectional plan view on the line 2 2, Fig. 1; and Fig. 3 is a sectional plan view of the bowl of the separator on the line 3 3, Fig. 1.

A represents the fixed frame or standard of the separator, having a central depending tube A' with the usual bearings a , a' , and a'' for the spindle B of the separator-bowl D, the latter being suitably secured to the upper end of the spindle. Screwed into the receiving-cup F at the bottom of the bowl, and also into the primary receiving-cup G at the top of the bowl, is a central tubular shaft H, which communicates at its lower end, through an opening in the bottom of the bowl, with passages in a disk or boss I, formed upon the bottom of the bowl, these passages communicating with discharge-pipes I' , having their outer ends contracted in area and bent rearward, so that steam, air, water, or other fluid under pressure passing through the hollow shaft H and escaping from the arms I' will cause rapid rotation of the separator-bowl, the fluid under pressure escaping from the casing A through a discharge-outlet suitably located—say, for instance, at the point I^2 .

Formed upon or secured to the upper end of the hollow shaft H is a hub J, having projecting hollow arms J' , similar to the arms I' , so as to provide a double motor, one element of which is above and the other below the bowl, although either of these elements may

be used alone, if desired. There may be but one reaction-arm I' or J' , or more than two of each, as circumstances may suggest. The upper motor is contained within a two-part casing K, divided longitudinally on a vertical plane, the two parts of the casing being hinged to a tubular stud b at one side of the fixed frame of the machine, this tubular stud receiving the pipe d , which serves to convey the supply of motive fluid under pressure to the hollow shaft H, said pipe d having at the upper end a T-coupling d' , from which projects a branch pipe f , properly held in position by lugs f' , projecting upward from the two halves of the casing K, the end of this pipe being bent downward and adapted to enter the upper end of the hollow shaft H, the fit of the pipe in the shaft being so loose that the shaft can rotate around the pipe without causing undue friction. A pipe K' is fitted to the upper portion of the casing K and provides a means for the escape of the fluid under pressure entering said casing from the hollow arms J' .

By reason of the longitudinally-divided casing having its parts hinged to the standard at the side of the machine the two parts of the casing can be readily thrown backward out of the way when it is desired to remove the separator-bowl and its spindle from the fixed casing or framework of the machine for cleansing or other purposes.

The milk is conveyed from the primary receiving-cup G at the top of the separator-bowl to the cup F at the base of the bowl through pipes g ; but instead of escaping directly from said cup F at the base of the bowl it is discharged directly therefrom through upwardly-extending conduits or tubes M, which in the present instance are flattened and form part of the radial partitions M' , which serve to carry the mass of milk around with the separator-bowl as the latter rotates. There may be as many or as few of these pipes M as desired. The milk escapes from each pipe M at a point as near the top of the bowl as may be desired, while the pipes N, for the escape of the skim-milk, communicate with the bowl at points comparatively close to the bottom of the same. By this means the milk escap-

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ing from the pipes M into the upper portion of the bowl is compelled to travel downward in order to find its way to the escape-pipes N for the skim-milk, and as this is in violation
 5 of the natural tendency of the liquid to rise in the bowl, owing to the centrifugal force, the milk is retained in the bowl until a thorough separation of the cream therefrom is effected before it is permitted to escape, there
 10 being a certain amount of separation in the pipes M before the milk escapes into the body of the bowl, the cream thus separated seeking the cream-wall at the inner portion of the liquid mass as soon as it escapes from the
 15 pipes.

The machine has the usual casings P and S, the former for collecting the cream from the discharge-openings i and the casing S for collecting the skim-milk from the discharge-
 20 pipes N.

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

1. A centrifugal separator comprising a
 25 bowl having a downwardly-projecting supporting-shaft and having at one end one or more hollow reaction-arms, a central hollow shaft communicating therewith and extending through the bowl and a fluid-supply pipe
 30 entering the open upper end of said shaft, substantially as specified.

2. A centrifugal separator comprising a bowl having a central shaft with one or more hollow reaction-arms above the bowl, a fluid-
 35 pipe entering the open upper end of said shaft, and a longitudinally-divided two-part casing inclosing said reaction-arms and separable in a horizontal plane, whereby the parts of the casing can be moved out of the
 40 way when it is desired to remove the bowl, substantially as specified.

3. A centrifugal separator comprising a bowl having a hollow shaft with hollow reaction arm or arms at its upper end, a vertically and laterally movable fluid-pipe entering the open upper end of said shaft, and
 45 a longitudinally-divided two-part casing inclosing said reaction arm or arms, the parts

of the casing being hinged to a vertical standard at the side of the machine so as to be
 50 swung apart in a horizontal plane, substantially as specified.

4. The combination of the frame of the machine having the hollow standard at one side, the bowl having a hollow shaft with hollow reaction arm or arms thereon, the fluid-
 55 supply pipe passing through the hollow standard and having a branch with downwardly-bent end entering the open upper end of the hollow shaft, and a longitudinally-divided
 60 two-part casing inclosing the motor and hung to the hollow spindle so as to be swung apart longitudinally, substantially as specified.

5. A centrifugal-separator bowl having a distributing-cup at the base, one or more conduits communicating at the lower end directly with said cup, and at the upper end with the upper portion of the separating-chamber of the bowl, and a skim-milk discharge-pipe communicating with the lower portion of said
 70 separating-chamber and extending to and discharging at the upper part of the bowl, whereby the milk is compelled to pass first downward, then upward, then again downward, and then again upward, both milk and
 75 cream discharging at the top of the bowl, substantially as specified.

6. A centrifugal-separator bowl having a distributing-cup at the bottom, a radial partition having formed therein a passage communicating at its lower end directly with said cup, and at its upper end with the upper portion of the separating-chamber of the bowl, and a skim-milk discharge-pipe communicating with the lower portion of the separating-
 85 chamber, and extending to and discharging at the upper part of the bowl, substantially as specified.

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

WM. C. HARTMANN.

Witnesses:

WILL. A. BARR,

JOSEPH H. KLEIN.