

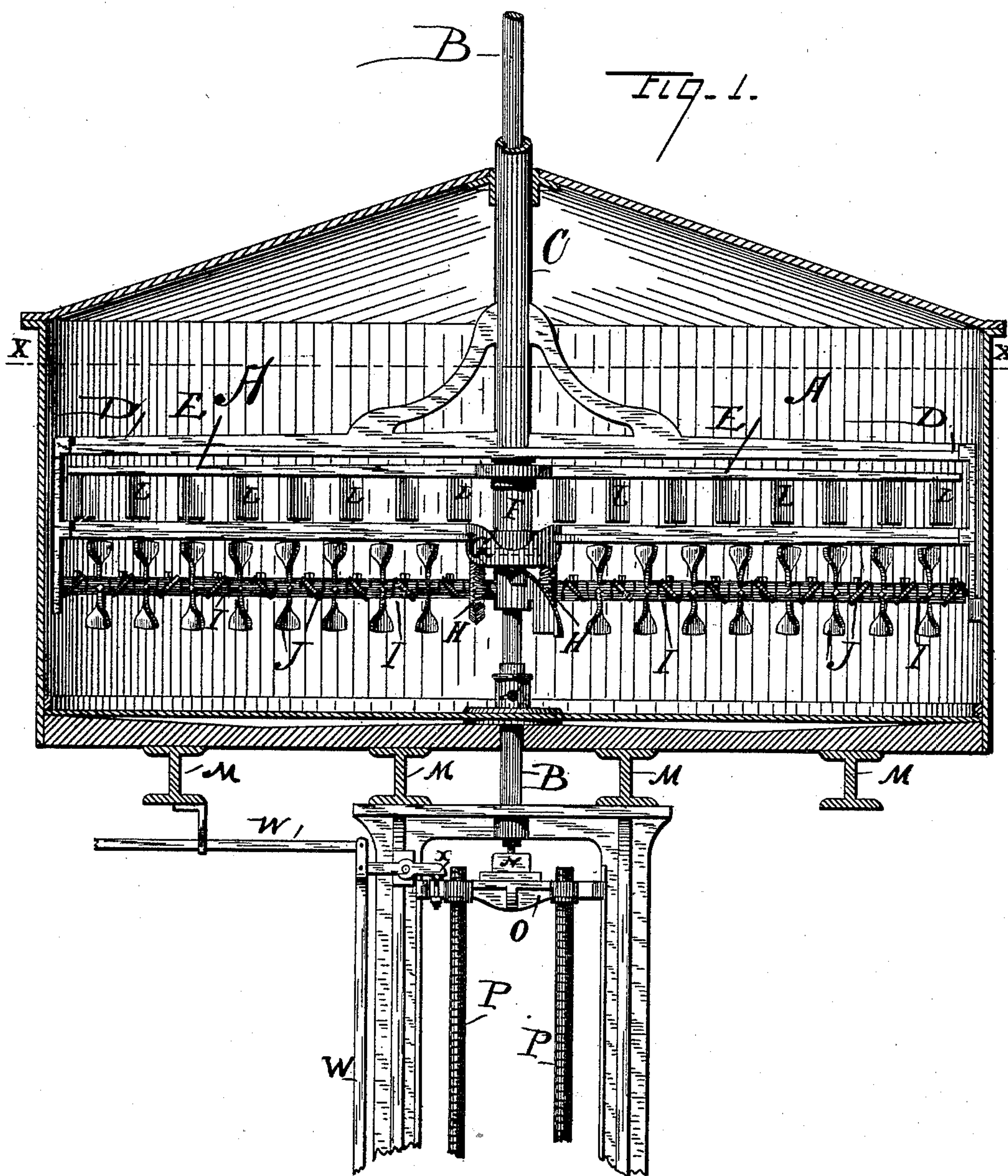
(No Model.)

3 Sheets—Sheet 1.

M. GOTTFRIED.  
MASHING MACHINE.

No. 412,955.

Patented Oct. 15, 1889.



WITNESSES

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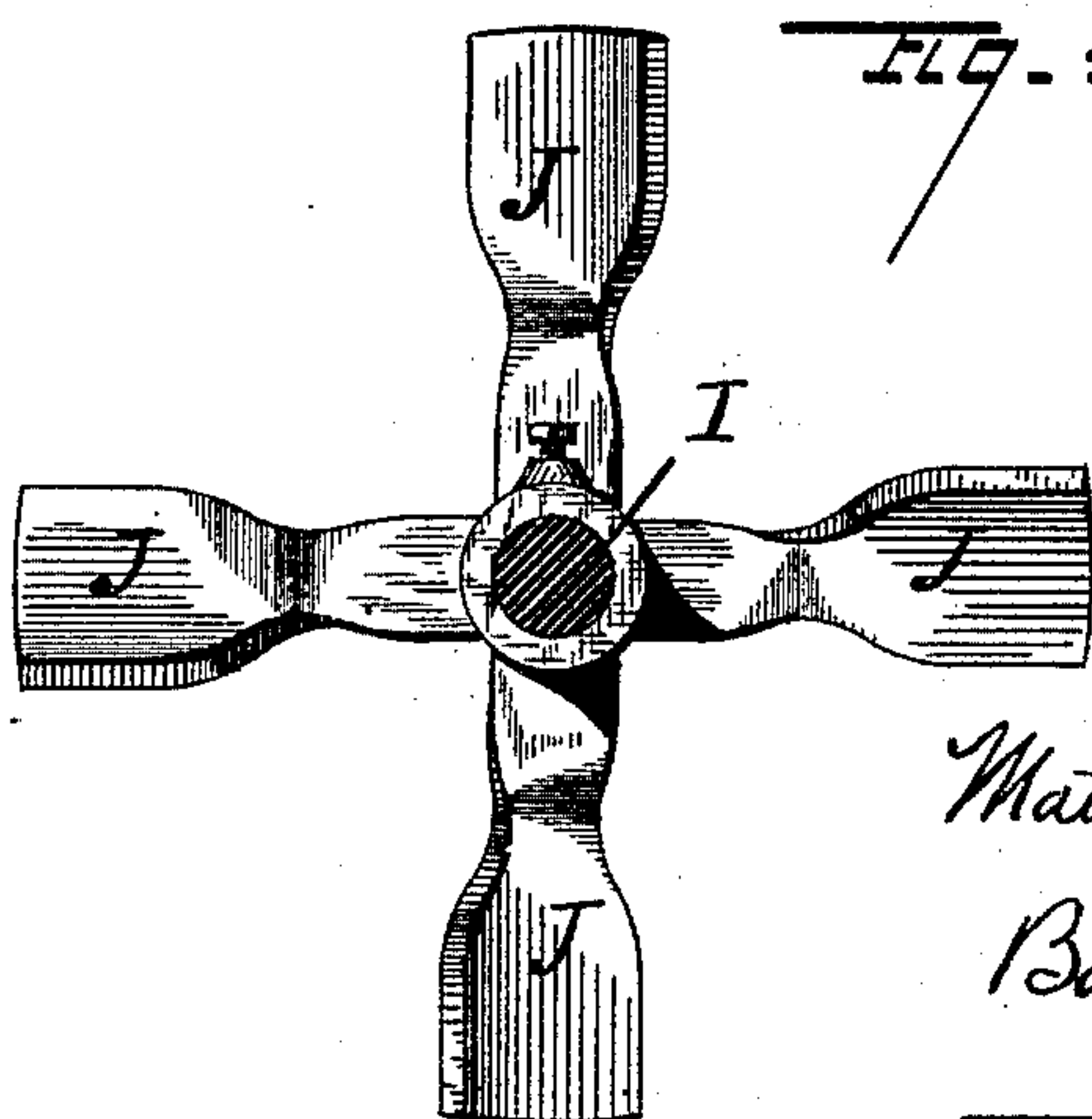
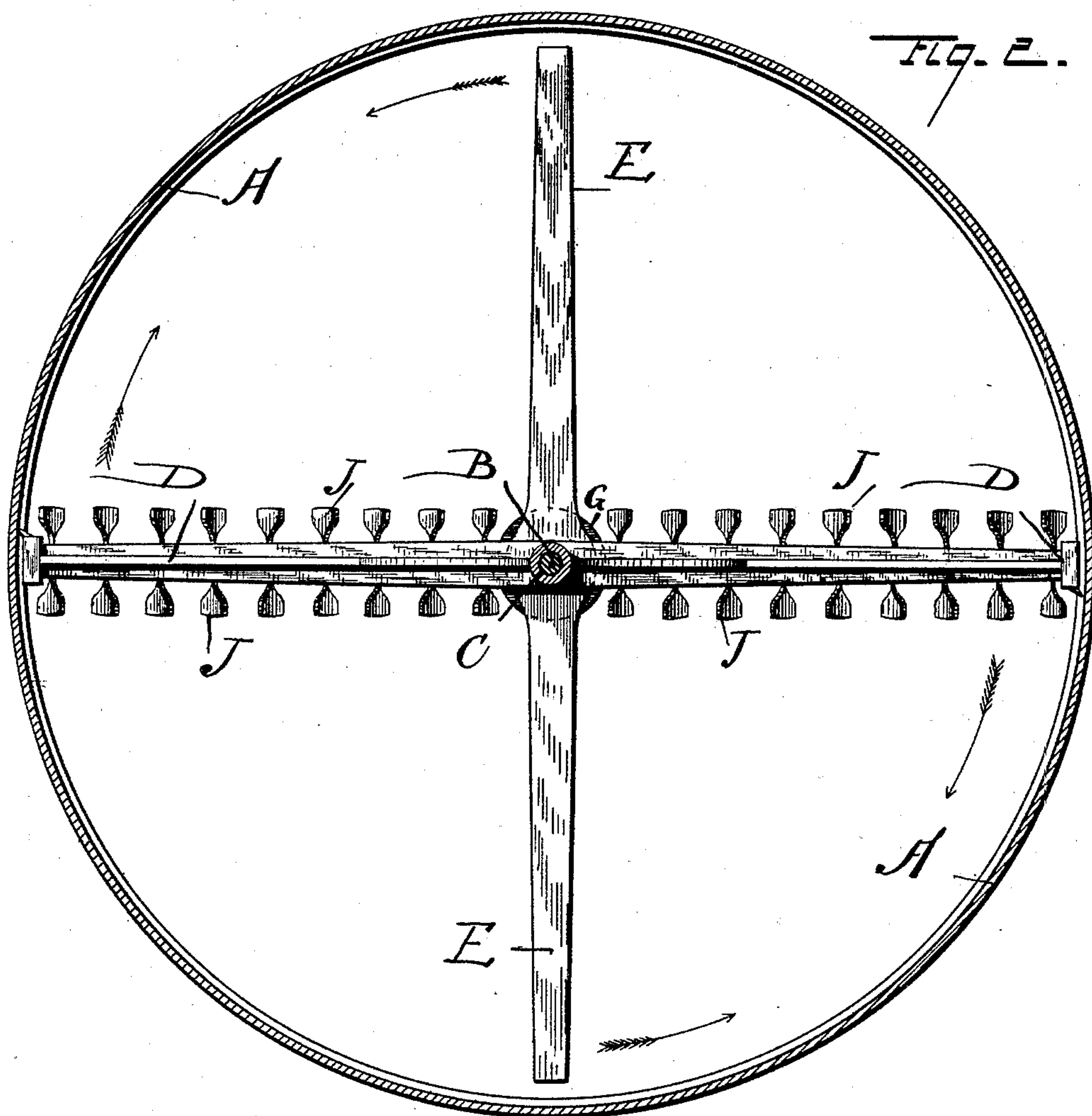
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**WITNESSES**

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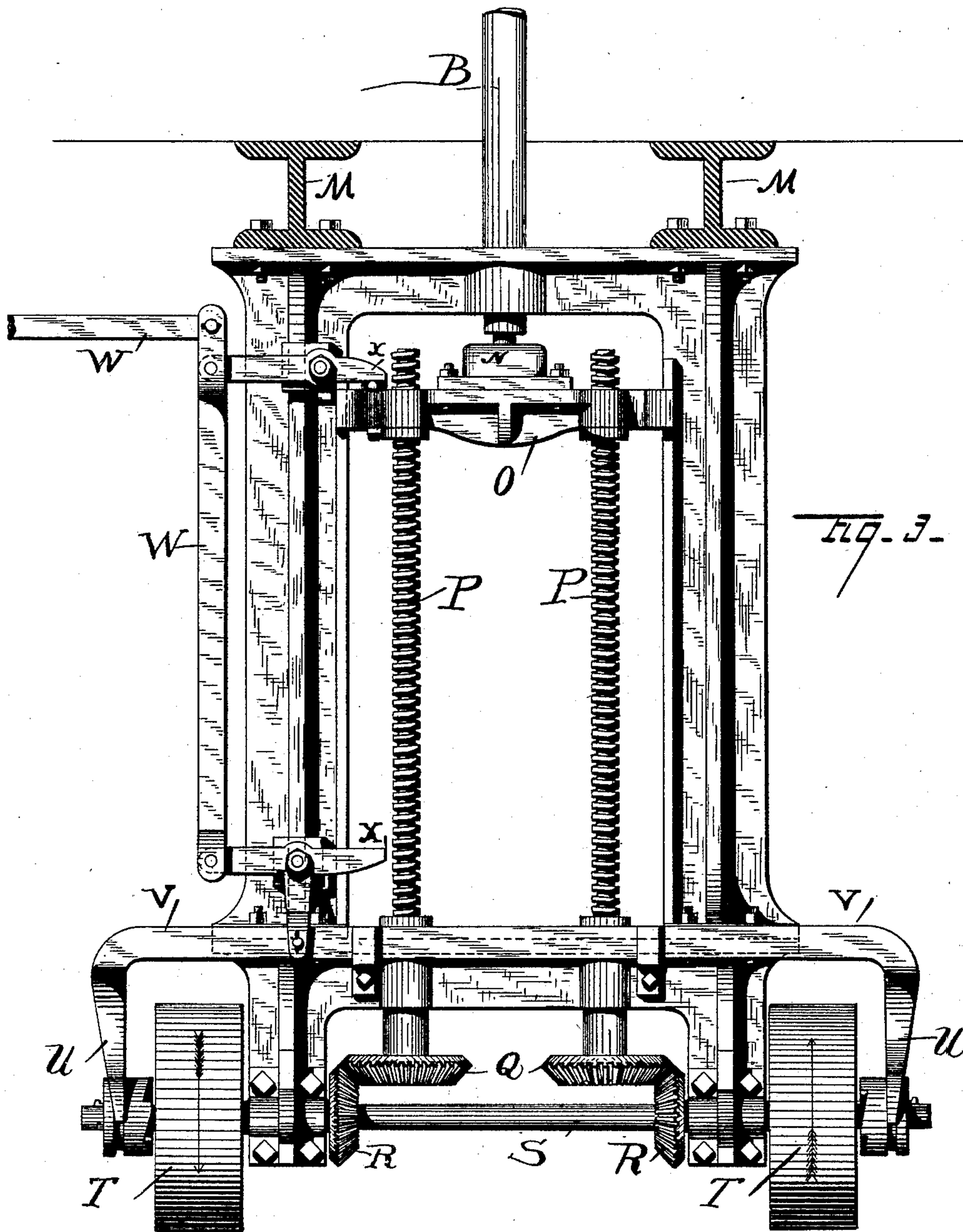
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# UNITED STATES PATENT OFFICE.

MATHEUS GOTTFRIED, OF CHICAGO, ILLINOIS.

## MASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 412,955, dated October 15, 1889.

Application filed April 12, 1886. Serial No. 198,548. (No model.)

*To all whom it may concern:*

Be it known that I, MATHEUS GOTTFRIED, a citizen of the United States, residing at Chicago, Illinois, have invented certain new and useful Improvements in Mashing-Machines, of which the following is a specification.

The object of my invention is to make a mashing-machine in which the beaters or stirrers revolve on a horizontal shaft while such shaft is being carried around a central vertical shaft, on which another horizontal bar provided with depending teeth or scrapers is carried around the vertical shaft in a direction opposite to that of the horizontal shaft carrying the revolving beaters or stirrers, to prevent a circular current or movement of the mash in the tub, and in which the beaters and stirrers may be raised or lowered as they perform their revolutions, so as to engage with a greater or less quantity of mash in the tub.

In the drawings, Figure 1 is a transverse vertical sectional view taken in the longitudinal direction of the horizontal shafts when at rest. Fig. 2 is a plan view of the mash-tub with the top removed, showing the opposite directions of the horizontal shafts. Fig. 3 is a side elevation of the mechanism for raising and lowering the revolving beaters and stirrers in the mash-tub, and Fig. 4 is an end view of the beaters or stirrers which revolve on the horizontal shaft.

In the drawings, A represents the mash-tub.

B is a vertical solid shaft passing down through the center of the mash-tub.

C is a hollow sleeve or shaft surrounding the solid shaft B, to which the frame-work in which the horizontal shafts with their beaters and stirrers are arranged is attached. D is such frame-work.

E is a horizontal bar or shaft containing depending stirrers or paddles attached to and carried around with the solid central shaft B.

F is another hollow section of shaft or sleeve surrounding the solid central shaft, just below the horizontal bar E, to the top of which such bar is attached, and which sleeve is also rigidly attached to the central shaft, with which it revolves.

G is a box or case on the lower portion of

the sleeve F, in which a beveled horizontal gear-wheel is placed, meshing in the pinions shown in Fig. 1, and which beveled gear-wheel revolves with the sleeve F and shaft B.

H are vertical pinions meshing into the horizontal beveled gear-wheel in the box D.

I are horizontal shafts journaled at the outer end in the end of the frame D and at the inner end in a hollow sleeve surrounding the solid vertical shaft B, below the box G, to which it is attached and from which it is suspended, and on the inner ends of which shafts the vertical pinions H are located.

J are paddles or stirrers revolving on the shaft I.

K is the bottom of the mash-tub.

L are paddles or stirrers on the horizontal bar E.

M are the beams or frame-work on which the mash-tub is supported, and from which the elevating and lowering mechanism is suspended.

N is a block or step, in which the lower end of the solid vertical shaft B rests.

O is a movable head-block or cross-head, on which the step or socket rests.

P P are screws or threaded shafts, by which the cross-head O is raised or lowered.

Q are horizontal beveled gears attached to the lower end of the threaded shafts P P, by which they are revolved.

R are vertical beveled pinions located on a horizontal shaft and meshing into the horizontal beveled gears Q.

S is such horizontal shaft.

T T are loose pulleys located on the shaft S, and connected by belting or other means to a source of power, by which they may be revolved, one in one direction to revolve the threaded shafts P P and raise the cross-head O with the horizontal shafts and beaters in the mash-tub, and the other in the other direction to lower them.

U U are depending forks or bars for throwing a clutch into or out of engagement when one or the other of the pulleys T T is desired to be revolved with the shaft S; V, a sliding bar connecting the depending forks U U.

W is a lever and connections by which the sliding bar V may be pushed in one direction or the other in throwing the clutches in or out of engagement, as desired.



X X are pivoted projecting points on the lever W, which are struck by the cross-head O or a portion or projection thereon when the threaded shafts have carried the beaters and stirrers in the mash-tub up or down to a certain point, by which automatic disengagement is secured and further raising or lowering prevented.

In building my improved mashing machinery I take a mash-tub of any desired construction and place in it a solid vertical shaft B, passing through its bottom at the center and up to the top of the mash-tub, or as high above the top as desired. I arrange to revolve this vertical shaft by gearing, or in any other suitable manner. A hollow sleeve or shaft C is placed around the upper portion of the solid shaft B, connected to and supporting a frame D, in which the horizontal shafts or bars carrying the beaters and stirrers are located. This hollow sleeve or shaft may be provided at its top with a gear-wheel, (not shown,) so as to be revolved; or other suitable means may be provided. Immediately below the upper bar or portion of the frame D is located another hollow sleeve F, which is rigidly fastened to the solid shaft B, so as to rotate with it. A horizontal bar E is attached to the upper part of this sleeve, carrying depending stirrers or paddles, which are carried around with it. The lower end of the sleeve carries a horizontal gear-wheel, which may be protected or covered by any suitable box or case. A second horizontal bar I, made in two sections or parts, with their outer ends journaled in the depending ends of the frame D and their inner ends in a horizontal sleeve depending from the box or case G, is arranged below the horizontal bar E. The inner ends of this bar I are provided with beveled pinions meshing into the gear-wheel above mentioned and by which they are revolved in opposite directions. On the upper bar or shaft E, I prefer to set the paddles or stirrers at an angle, as shown in Fig. 1, so as to turn the mash toward the center of the tub. On the two sections of the shaft I beaters and stirrers are arranged, which revolve on it and are carried around with it. These stirrers or paddles have their ends twisted or curved, so as to incline or push the malt toward any desired point of exit. To reach every point of the mash-tub and stir and move the malt, I arrange stirrers on the outside of the frame D, to remove the mash from the sides of the tub, and also a scraper attached to the box G, to remove the mash from around the shaft and move it out where it can be acted upon by the stirrers J. It will be seen that as the solid vertical shaft B revolves it will cause the horizontal bar E, carrying one set of beaters, to revolve around the mash-tub. The revolution of this bar E will turn the sleeve F and cause the gear-wheel in the box G to revolve, and so impart motion to the shafts I through the beveled pinions H. The shafts I, with

their stirrers or paddles, will also revolve around the mash-tub, as the hollow shaft C and the frame D, in which they are located and in which their outer ends are journaled, revolve through means of the gear-wheel or other means for imparting motion to the hollow shaft C, which I have said could be arranged at its top in any of the usual ways.

The solid shaft B passes down through the bottom of the mash-tub, and its lower end rests in a step or socket N. This step or socket is located on an adjustable cross-head O, which may be moved up or down by means of screw-threaded shafts P P, which pass through threaded holes in the cross-head adapted to receive them. These threaded vertical shafts terminate at their lower ends in beveled gear-wheels Q, which mesh into beveled pinions R R on a transverse shaft S. This shaft is revolved in one direction or the other by means of the pulleys T T, as it is desired to raise or lower the cross-head O and the mechanism superincumbent thereon. These pulleys T T revolve loosely on the shaft S until they are thrown into engagement by means of the clutches operated by the depending portions U U of the transverse sliding bar V, sliding through suitable eyes or other means for holding it in its proper position. To throw one or the other of these clutches in engagement by hand, a lever Y is provided, passing to a point within convenient reach of the operator. This lever is connected by proper links to the lever W, through means of which the sliding bar V may be pushed in one direction or the other, as desired. To automatically disengage the clutches and stop the raising or lowering of the cross-head O and the beaters and stirrers in the mash-tub above, projecting pieces X X are provided, as shown in Fig. 3. As the cross-head is raised or lowered, it or a portion of it or a projection thereon strikes against one or the other of these pivoted and projecting pieces and operates the lever W, and through the sliding bar V the forks or bars U, so that the clutches are disengaged from the pulleys T T and the upward or downward movement of the cross-head O automatically stopped. The pulleys are provided with belts connecting with any proper motive power, and by which they are revolved in the proper direction.

It will be understood the cross-head, threaded shafts, pulleys, beveled gear-wheels, and other mechanism described in Fig. 3 are suspended under the mash-tub by means of suitable frame-work bolted or otherwise attached to the beams or sills M, which support the mash-tub above. By making the pitch in the threads of the vertical shafts P P greater in the one by which the cross-head is raised than in the one in which it is lowered, or by revolving it more rapidly, the beaters and stirrers in the mash-tub may be raised much more rapidly than lowered. When a large quantity of mash is in the tub, the descent



of the beaters and stirrers into the same should be more gradual than the raising them out of the mash.

The operation of the machine is as follows:

5 Ground malt is admitted into the tub in any convenient way and water is supplied to the same as needed or desired. Power is applied to the solid shaft B and the hollow shaft C, and the beaters and stirrers revolved in the  
10 mash-tub, as above described. The clutch is engaged with the proper pulley to revolve the shaft S in the direction to lower the cross-head O and the beaters and stirrers in the mash-tub while the same are in operation.  
15 They slowly descend while revolving and thoroughly mix, beat, and stir the mash in the tub. After the cross-head has descended until it presses against the lower pivoted point X and throws the clutch out of engage-  
20 ment the parts cease to descend; or, if preferred, the beaters and stirrers may be run down to the bottom of the mash-tub before they are started to revolve and before the introduction of the malt, and gradually raised  
25 while in operation as the malt accumulates in the tub. While they are being raised they of course constantly revolve in the tub and thoroughly beat and mix the malt. If desired, the clutch may be thrown out of engagement  
30 at any point in the upward or downward movement of the beaters and stirrers, when they will be revolved at that point. In this way the beaters and stirrers may be made to operate at any desired depth in the malt,  
35 either at the top, a part of the way down, or throughout the entire depth of the malt in the tub. After the malt has become thoroughly mixed and stirred, so that the malt extract is ready to be allowed to settle and  
40 to be drawn off, the revolution of the beaters and stirrers may be stopped, the proper clutch thrown in gear, and the cross-head O with the beaters and stirrers run up to their highest point, so that the beaters and stirrers will be  
45 out of the mash. After the malt extract has properly settled it may be drawn off in any convenient manner. As a certain quantity of dough has settled on top of the grain, the beaters and stirrers may be started in opera-  
50 tion and slowly lowered until they cut and break up this dough. Water may then be sprinkled on and allowed to soak down into the grain and drawn off with the malt extract. When the mashed grain is ready to be re-  
55 moved from the mash-tub, one or more holes in the bottom of the tub may be opened and

the grain started through the same. By then starting the beaters and stirrers to revolve and slowly lowering them in the mash-tub the grain will be scraped to the openings in  
60 the bottom and allowed to pass off through a pipe or other convenient means to wagons or other receptacles. In this way I am able to entirely clean the mash-tub of mashed grain  
65 through the operation of the beaters and stirrers while the same are being revolved and lowered.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a mash-tub, the combination of a hori-  
70 zontal arm centrally mounted and rotated in a horizontal plane, stirrers or beaters carried by said horizontal arm and operated by such rotation, and means for raising and lowering  
75 said horizontal arm while in rotation and automatically stopping said raising and lowering at predetermined limits, substantially as described.

2. In a mashing-machine, the combination of a mash-tub, a vertical revoluble shaft, a  
80 horizontal shaft arranged within the tub and revolved by the rotation of the vertical shaft, stirrers or beaters mounted on the horizontal shaft, and means for raising and lowering the  
85 vertical and horizontal shafts and stopping such raising and lowering at points up and down while the same are revolving in use, substantially as described.

3. In a mashing-machine, the combination of a mash-tub, a vertical revoluble shaft, a  
90 horizontal shaft within the tub, revolved by the rotation of the vertical shaft, stirrers or beaters mounted on the horizontal shaft and operated by such rotation, and means for raising and lowering the horizontal shaft  
95 while in operation, substantially as described.

4. In a mashing-machine, the combination of the mash-tub, a vertical revoluble shaft ex-  
100 tending into the tub from the outside, a horizontal shaft arranged within the tub and revolved by the rotation of the vertical shaft, stirrers or beaters mounted on the horizontal shaft, and means for raising and lowering the  
105 vertical and horizontal shafts and automatically stopping such raising and lowering at certain points up and down, substantially as described.

MATHEUS GOTTFRIED.

Witnesses:

A. S. PARÉ,  
EPHRAIM BANNING.