(No Model.) 3 Sheets—Sheet 1.

G. SCHOCK.

MASH STIRRER.

No. 484,883. Patented Oct. 25, 1892.

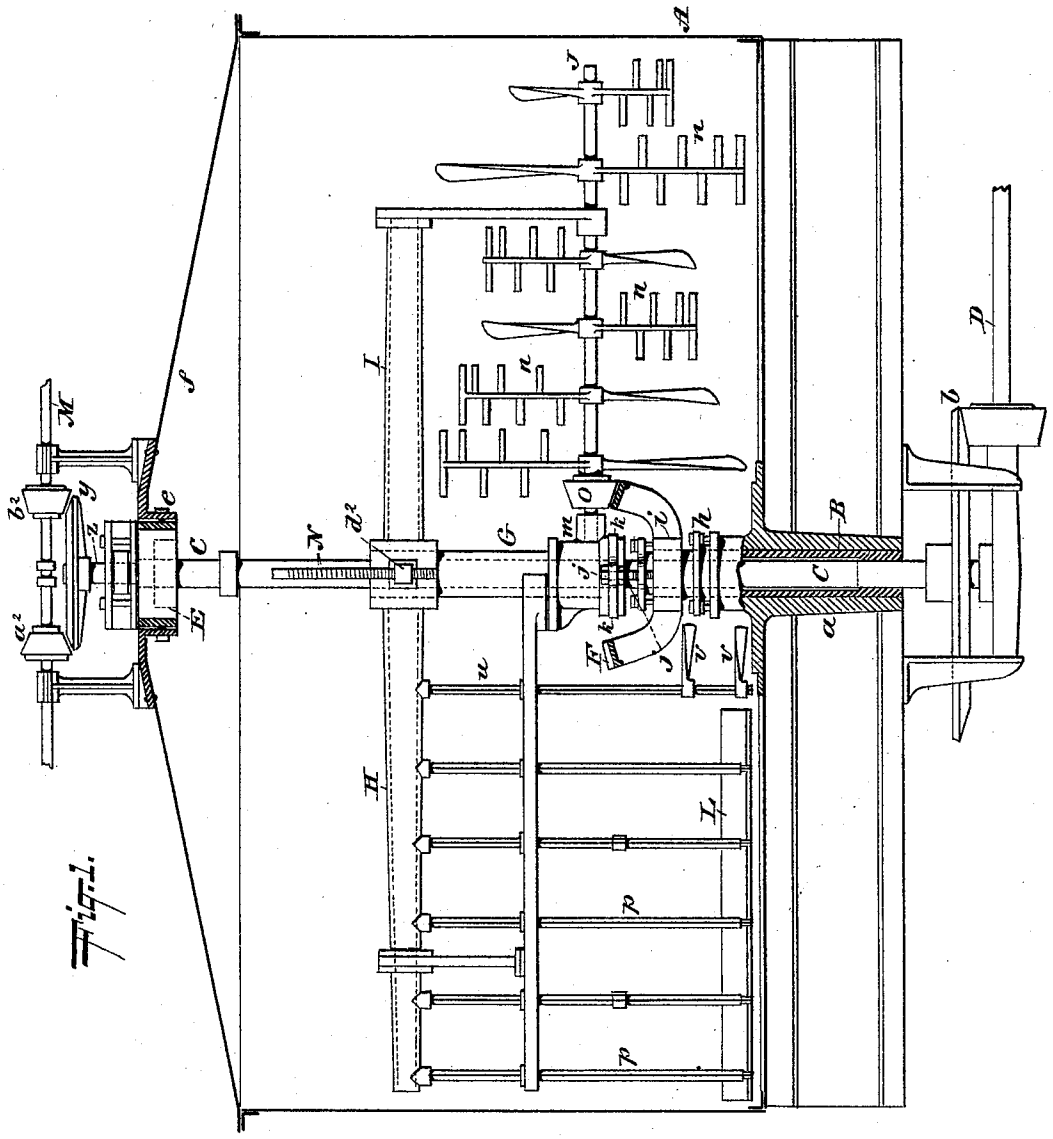

Fig. 1.

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(No Model.) 3 Sheets—Sheet 2.

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Fig. 2.

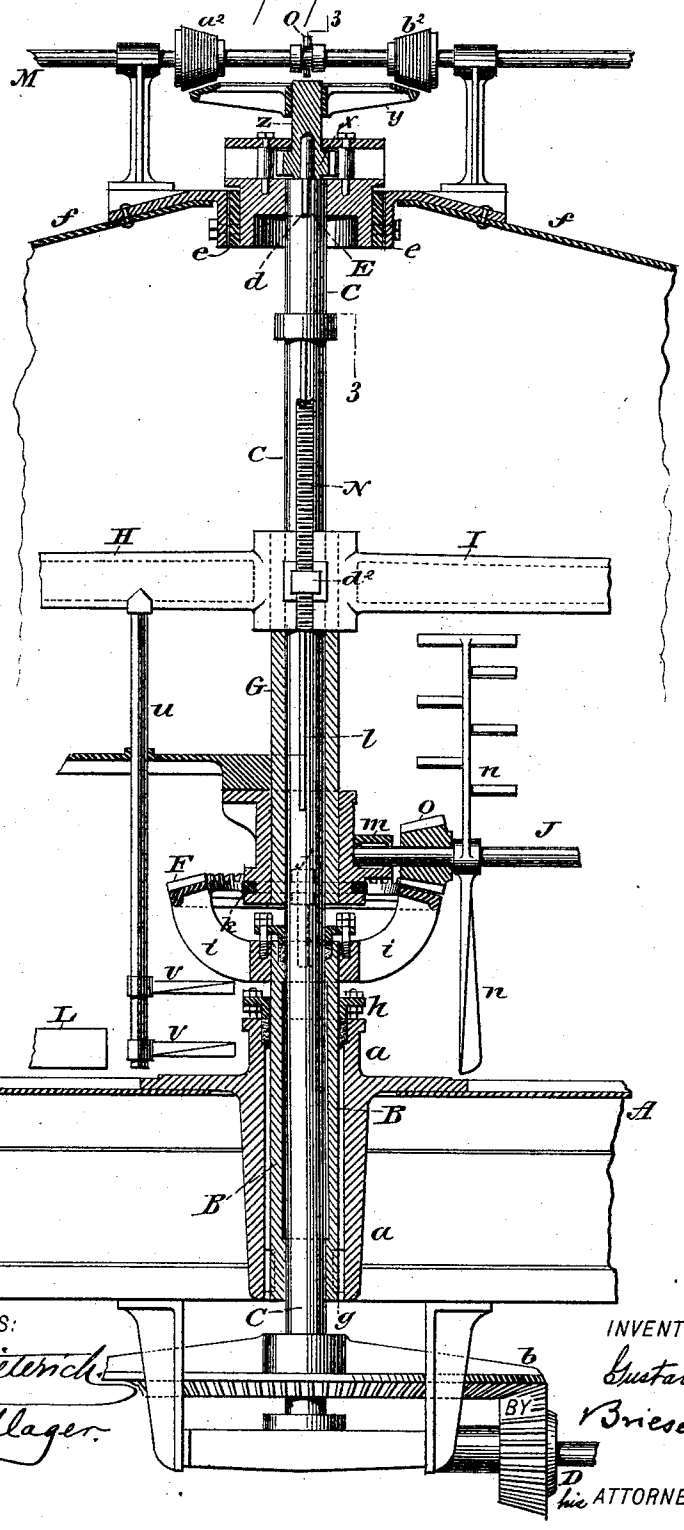

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Fig. 3.

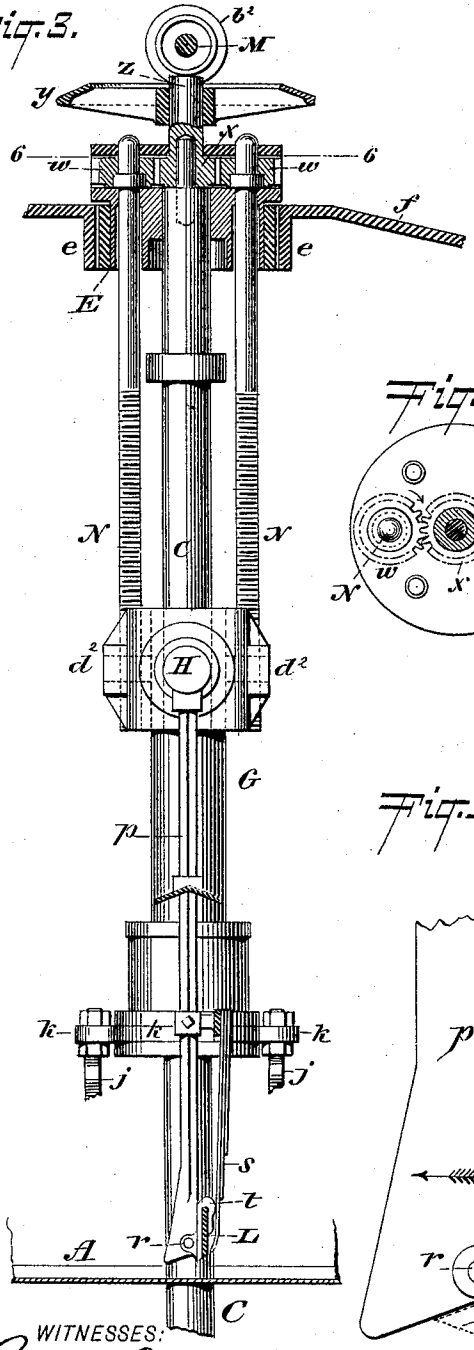


Fig. 6.

Fig. 4.

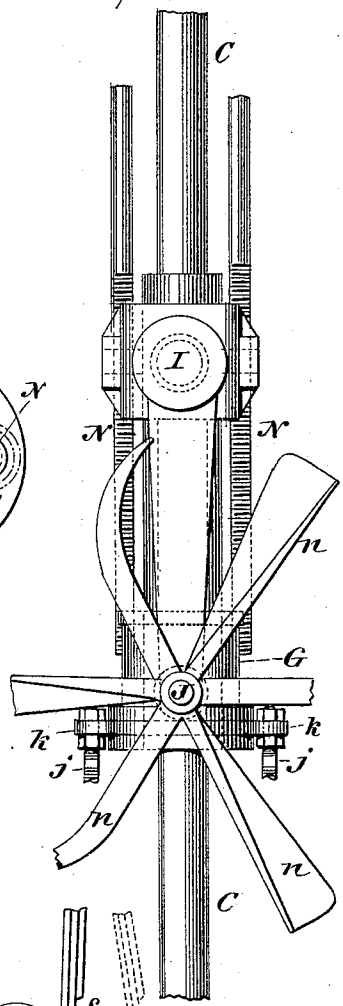
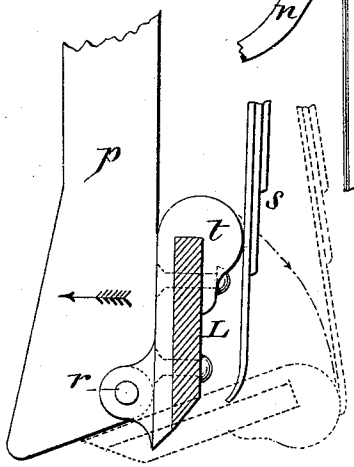


Fig. 5.



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UNITED STATES PATENT OFFICE.

GUSTAV SCHOCK, OF NEW YORK, N. Y.

MASH-STIRRER.

SPECIFICATION forming part of Letters Patent No. 484,883, dated October 25, 1892.

Application filed May 16, 1892. Serial No. 433,087. (No model.)

To all whom it may concern:

Be it known that I, GUSTAV SCHOCK, a resident of the city, county, and State of New York, have invented an Improved Mash-Stirrer, of which the following is a specification, reference being had to the accompanying drawings, forming part hereof, wherein—

Figure 1 represents a vertical central section of my improved mash-stirrer, the inner working parts being mainly indicated in side view. Fig. 2 is an enlarged vertical central section and side view of the inner or central portions of the stirring mechanism. Fig. 3 is a partial vertical section and side view of the central portion of said stirring apparatus, the line 3 3, Fig. 2, indicating the plane of section, the lower sleeve around the vertical shaft being removed from this figure. Fig. 4 is a detail side view of mechanism on the opposite side to that which is represented by Fig. 3. Fig. 5 is a detail cross-section through the scraper. Fig. 6 is a horizontal section on the line 6 6, Fig. 3.

This invention relates to sundry improvements on mash-stirring apparatus; and it consists of the new combinations and arrangements of parts that are hereinafter more fully specified, and pointed out in the claims.

In the accompanying drawings, the letter A represents the tub, which tub at its bottom has in the center a downwardly-projecting socket or tubular extension *a*. Within this socket or tubular extension *a* is contained a vertical tube or sleeve B, and within this vertical tube or sleeve is the main vertical shaft C of the apparatus. This shaft is stepped in a suitable framing at the lower end, and is by bevel-gearing *b* or otherwise rotated from a driving-shaft D. At the upper end the shaft C is properly centered by being keyed (see key *d*, Fig. 2) in a circular box E, which runs in an annular bushing *e*, that is carried by the roof *f* of the mash-tub A. It follows that when the shaft C rotates the box E is also revolved.

Returning to the vertical sleeve B, it will be noted that the same is by means of feathers or keys *g* (which are shown at the lower part of Fig. 2) held in the socket *a*, so that it (the sleeve B) cannot revolve. Hence the shaft C revolves within the sleeve B; but nevertheless the sleeve B is capable of vertical adjustment, as will be hereinafter more fully described. Where the sleeve B projects upwardly from the socket *a* it is provided with a stuffing-box *h*, which prevents any matter contained within the mash-tub from entering the annular space that is formed between the sleeve B and the socket *a*.

I deem it a very great advantage which results from this construction—namely, that the stuffing-box *h* is applied above the bottom of the mash-tub to exclude matter from the spaces within the socket *a*. In mash-stirring apparatus in which the main vertical shaft is driven from below this placing of the stuffing-box above the bottom of the mash-tub is by me regarded as a novelty. Heretofore in mash-stirring apparatus having the vertical shaft driven from below the stuffing-boxes were placed below the bottom of the mash-tub, and consequently did not prevent moisture and impurities entering into the creases around the shaft and souring where they lodge, thereby contaminating the entire contents of the mash-tub.

It is perfectly clear that although the drawings represent part of the socket *a* extending upwardly from the bottom of the mash-tub, my invention will apply where none of the socket *a* extends upwardly from the bottom of the mash-tub, provided the stuffing-box *h* is located above said bottom.

The upper part of the sleeve B, which, as we have seen, is non-revolving, is connected by brackets *i* with an annular rack or toothed ring F, which, since the sleeve B is non-revolving, is also non-revolving. By means of screws *j*, of which one is indicated by dotted lines in Fig. 2, and which are also indicated in Figs. 3 and 4, the upper part of the sleeve B is connected with a ring *k*, that is carried by a revolving sleeve G in a groove formed within the outer circumference of said revolving sleeve G or of an enlargement thereof. By means of this connection *j* between the non-revolving sleeve B and the ring *k*, which ring *k* is therefore also non-revolving, the sleeve B is rendered capable of vertical adjustment with the revolving sleeve G, as hereinafter described, and the ring *k*, being carried in a groove of the revolving sleeve G, is permitted to remain non-revolving.

The sleeve G, which has been described as

a revolving sleeve, is by key or feather *l* (see Fig. 2) so connected with the shaft C that it will be rotated whenever said shaft is rotated, and that it will in turn revolve the stirring and scraping devices, to which we will hereinafter refer—that is to say, the sleeve G carries radial arms H I in suitable numbers, and causes them to rotate within the mash-tub around the axis of the vertical shaft C whenever this vertical shaft is revolved. The radial arm I, together with a box *m* on the sleeve G, furnishes a support for a horizontal shaft J, which carries various kinds of stirrer-blades and stirring contrivances *n n*. The shaft J also carries a toothed pinion *o*, that is in contact with the toothed surface of the ring F. Hence when the arm I is revolved around the axis of the vertical shaft C, and with it the shaft J, said shaft J is at the same time also revolved on its own horizontal axis, and with it the stirrer-blades, so that these stirrer-blades will thoroughly agitate the contents of the mash-tub, reaching every part thereof during their revolution around the vertical shaft, and taking them up and distributing them during their revolution around the horizontal shaft. The arm H, which also projects from the rotary sleeve G, has downwardly-projecting rods *p*, to whose lower ends the scraper-blade L is pivoted, as at *r*. Fig. 5 illustrates this pivotal connection and shows that the scraper-blade extends farther above its pivot *r* than below the same and that its lower portion is sloped or tapered, as indicated. Springs *s*, which are affixed to the upright arms *p*, bear against knobs *t*, that are affixed to the upper portion of the scraper-blade and tend to keep the scraper-blade normally in its upright position, being the position which is indicated by full lines in Fig. 5. It will be observed, also, from Fig. 5 that the springs *s*, which perform the function last mentioned, extend quite a distance down below the knob *t* when the scraper-blade is in its normal position. The object of the scraper-blade is to scrape and carry before it the mash or matter contained within the mash-tub and present it in new positions to the stirrer-blades or instrumentalities *n;* but it has been found in practice that when by carelessness of the attendant or from some other cause the scraper-blade is brought in contact with too great a thickness of matter in the mash-tub some part of the mechanism is liable to break, the strain being excessive, especially as the contents of a mash-tub are moistened and very heavy.

To obviate the injury to the parts of the apparatus from the cause just named, I have pivoted the scraper-blade and caused its upper portion to extend farther above the pivot than does the lower portion, so that when the blade during its movement in the direction of the arrow, which is shown in Fig. 5, meets with too great a height of matter it will swing on its pivot against the pressure of the spring *s* into the position which is indicated by dotted lines in Fig. 5, and will in that position be a most effective scraper to disseminate the matter at the bottom of the mash-tub and obviate the difficulty of too high an accumulation at any one point, and whenever the thickness of mash or other obstruction is again reduced within the mash-tub the pressure of the springs *s* will suffice to automatically raise the scraper-blade back into its normal vertical position. I have also found that in mash-stirring devices it frequently occurs that the stirring instrumentalities working necessarily at some distance from the central shaft will cause an accumulation of mash-matter near the said central shaft, permitting it to rise there, whereas at the greater distance from said shaft the mash will be less thick. To prevent this accumulation of mash near the shaft, I have secured to the arm H near the shaft a pendent rod *u*, which has spirally-arranged blades *v*, that extend toward the central shaft C, coming as close thereto as possible. These blades *v* serve to move the mash away from the central shaft and its neighborhood and to prevent the central accumulation mentioned.

It remains to describe how for the purpose of cleaning and for other purposes the entire stirring mechanism may be raised or lowered, together with the non-revolving sleeve B. To this end I support in the rotary box E, which is carried at the upper part of the shaft C, three toothed wheels *w w x*. The central one of these toothed wheels—to wit, the wheel *x*—carries on an upwardly-extending stem *z* a friction or toothed wheel *y*, near which there are placed upon a horizontal shaft M friction-cones a^2 and b^2, as shown in Fig. 2. The central wheel *x* meshes into the toothed wheels *w w*, as indicated in Fig. 6. Each of these toothed wheels *w w* connects rigidly with a downwardly-extending screw N, there being two such screws, as shown in Fig. 3, one for each of said wheels. These screws mesh into the threads of nuts d^2, that are carried by the rotary sleeve G. Normally when both cones a^2 and b^2 are out of contact with the wheel *y*, as in Fig. 2, the shaft C when revolving will carry by means of the box E, with which it is feathered, the screws N N around with it and with the sleeve G and the appurtenances thereof; but when for any cause a vertical adjustment is desired it is only necessary to move one of the cones a^2 b^2 into frictional or other contact with the wheel *y*. This can be done by a shipping-lever O, which is indicated in Fig. 2. When by means of this shipping-lever one of these cones a^2 b^2 is thrown against the wheel *y*, said wheel *y* is revolved on its own axis, and consequently the central toothed wheel *x* is also revolved in one certain direction. The screws N N are thereby turned to lift the sleeve G or to lower it, according to the cone a^2 b^2, which has been thrown into connection—that is to say, by moving the shipping-lever O in one direction the screws will be caused to raise, and by mov-

ing it in the other direction they will be caused to lower the sleeve G, and when they do raise or lower the sleeve G they also by means of the connecting-ring *k* and screws *j* raise or lower in like degree the non-revolving sleeve B, so that the relative distance between the annular rack F and pinion *o* is never disturbed.

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

1. The combination of the mash-tub A and the vertical central shaft C therein and mechanism, substantially as described, for rotating said shaft from the lower end thereof with the non-rotating socket *a*, extending downwardly from the bottom of the mash-tub, non-revolving sleeve B, contained within said socket and surrounding said shaft C, and with the stuffing-box *h*, said stuffing-box being placed above the bottom of the mash-tub against the outside of the sleeve B, all arranged so that no part of the body of the rotating shaft comes in contact with the mash in the tub, as specified.

2. The combination of the mash-tub A and its vertical central shaft C with the non-revolving sleeve B, surrounding the lower part of said shaft, and with stuffing-box *h*, placed above the bottom of the mash-tub, screws or connecting-rods *j*, non-revolving ring *k*, and rotary sleeve G, and mechanism, substantially as described, for revolving the sleeve G, all arranged so that the non-revolving ring *k* and the non-revolving sleeve B are connected with the revolving sleeve G for the purpose of vertical adjustment, substantially as herein shown and described.

3. In a mash-stirring apparatus, the combination of a scraper-blade L with vertical carrying-arms *p*, pivot *r*, and spring *s*, the scraper-blade extending above the pivot *r* farther than below said pivot, so as to be capable of automatic adjustment, substantially as herein shown and described.

4. The combination, in a mash-stirring apparatus, of the mash-tub A, vertical central shaft C, and horizontal and vertically-adjustable arm H with the scraper L and pendent rod *u*, the latter being rigidly attached to said arm intermediate of the said scraper L and shaft C, and with the blades *b*, projecting therefrom toward the shaft C and in close proximity thereto, so as to prevent the material collecting around said shaft C, substantially as and for the purpose herein shown and described.

5. The combination of the vertical shaft C and mechanism, substantially as described, for revolving it with the vertically-movable sleeve G and scraping mechanism carried by said sleeve G, nuts d^2, also carried by the sleeve G, screws N N, engaging said nuts, pinions *w w*, carried by said screws, central pinion *x*, mounted on the main vertical shaft C and engaging the pinions *w w*, frictional wheel *y*, carried by the central pinion *x*, and frictional cones a^2 b^2, and means for engaging said cones with the frictional wheel *y*, whereby the sleeve G can be raised or lowered, substantially as described.

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Witnesses:
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