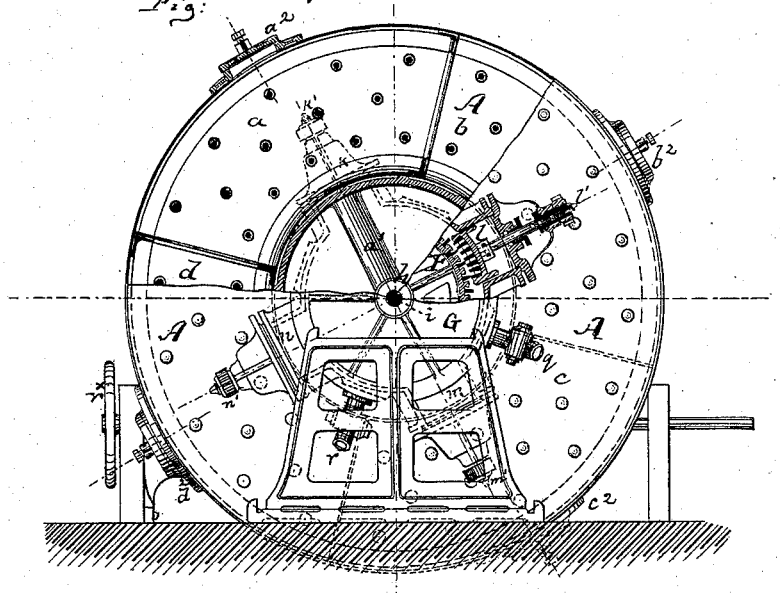
W. VON SYDOW.

Mixing and Mashing Machine.

No. 197,955. Patented Dec. 11, 1877.

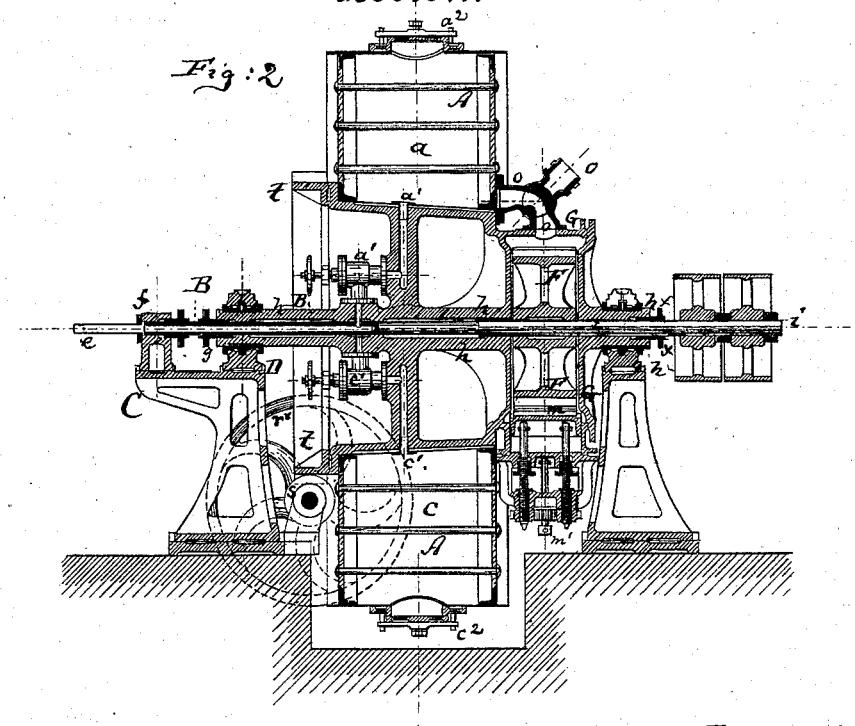
front view.

Fig: 1



section.

Fig: 2



Witnesses:

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scale 1:20.

Inventor:

Wilhelm v. Sydow

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# UNITED STATES PATENT OFFICE.

WILHELM VON SYDOW, OF BÄRFELDE, PRUSSIA, GERMANY.

## IMPROVEMENT IN MIXING AND MASHING MACHINES.

Specification forming part of Letters Patent No. **197,955**, dated December 11, 1877; application filed September 13, 1877.

*To all whom it may concern:*

Be it known that I, WILHELM VON SYDOW, of Bärfelde, Prussia, Germany, have invented a new and Improved Mashing Apparatus, of which the following is a specification:

This invention relates to an improved apparatus for mashing and intermixing various substances, such as may be used as food for cattle, for distilling, brewing purposes, for the commingling and proper reduction of paints, starch, paper, soap, and other material in the various arts referred to.

The invention consists in the various details of construction hereinafter more fully pointed out.

In the accompanying drawing, Figure 1 is a side view, partly in section, and Fig. 2 a central transverse section, of my improved apparatus.

Similar letters of reference indicate corresponding parts in all the figures.

The letter A represents an annular drum, made of sheet metal or other suitable material, and mounted on a hollow axle, B, with which it is free to revolve, the said axle resting in suitable supports or bearings C D. The annular drum A is, by radial partitions, divided into four (more or less) steam-tight chambers, *a b c d*, which communicate, respectively, with the hollow axle B by pipes $a^1$ $c^1$, &c., which pipes also serve as braces, either alone or with other braces, to connect the drum A to its hub *h*.

The axle B is at one end connected to a stationary pipe, *e*, which communicates with a suitable steam-generator, a stuffing-box, *f*, being provided at the junction of the pipes B *e* to prevent the escape of steam. Another stuffing-box, *g*, is placed to prevent the escape of steam at the end of the hub *h* of the drum.

By the arrangement above described steam can be admitted from the generator through the pipes *e* B and $a^1$ $c^1$, &c., into the chambers *a b c d*, respectively, while the drum is revolving or when stationary.

The pipes $a^1$ $c^1$, &c., are provided with stop-cocks, by which the steam can be shut off from or admitted to any or all of the chambers *a b c d*. Each of these chambers is provided with a suitable man-hole or hand-hole for introducing the matter to be mashed and intermixed. These openings can be closed steam-tight by covers $a^2$ $b^2$ $c^2$ $d^2$, made of appropriate construction. Each chamber should also be provided with a glass gage, a manometer, and an air-cock, or their equivalents.

The masticating attachment, for masticating or cutting up the matter to be mashed or reduced, is applied to one side of the drum A, and consists of a toothed, ribbed, or roughened wheel, F, hung on a spindle, *i*, within a suitable case, G, which is rigidly attached to the drum A. The spindle *i* is contained partly within the hollow hub of the drum, as clearly shown in the drawing, and a stuffing-box, *x*, is placed at the end of said hub on the spindle *i*, to prevent the escape of steam. The spindle *i* is provided with a pulley or other device by which rotary motion may be imparted to the toothed wheel F, independent of the rotation of the drum.

Opposite to the grinding-wheel F are applied within the casing G four, more or less, toothed or ribbed segments *k l m n*, between which and the wheel F the mashing or masticating process is effected. The distance between the toothed segments *k l m n* and the grinding-wheel may be varied by screw-spindles and adjusting apparatus *k' l' m' n'*, so that the degree to which matter introduced is to be ground, reduced, or broken, may be regulated thereby.

Each of the chambers *a b c d* is connected with the chamber G by a three-way cock, *o q r*, &c., one arm of each of said cocks communicating with its respective chamber, while the second arm communicates with the chamber G, and the third serves as a discharge.

To complete the description of the apparatus, it should be added that the drum A may be slowly revolved by turning a hand-wheel, $r^{\times}$, which revolves a worm, *s*, that engages into the teeth of an annular toothed wheel, *t*, attached to the drum A; but other means for revolving the drum may be used.

The operation of the apparatus is as follows: One, two, or more of the chambers *a b c d* are filled with the matter to be mashed and intermixed. Steam or steam and water is then introduced into such chambers, and the same are afterward set in communication with the masticating attachment and with each other by properly adjusting their respective three-

way cocks. The empty chambers are or may also be made to communicate with the masticating attachment and with the full chambers. The steam will now thoroughly soften the matter in the chambers, and will, when the three-way cocks have been opened, aided, if desired, by the gravity of the contents, force the same from the upper chambers into the masticating attachment, and thence into the empty lower chamber or chambers of the drum. The drum A may now be partly revolved to bring the filled chambers to the top, and the operation can be repeated until the matter is thoroughly and properly mashed. While passing through the masticating apparatus, the wheel F is revolved, to properly reduce the contents. By filling the different chambers with different substances, and causing certain of the chambers to communicate with each other, through the masticating apparatus, the different substances contained in such chambers will be thoroughly intermixed, besides being reduced. The matter, after being properly mashed and intermixed, is discharged through the discharge-arms of the three-way cocks *o q r*, &c.

If it is desired to still more thoroughly mix the different materials contained within the chambers *a b c d*, the drum A may be continuously and rapidly rotated by an endless belt passing over the same, or in other equivalent manner, in which case the worm is disconnected. The worm, while connected, serves also to hold the drum stationary as long as desired.

I claim as my invention and desire to secure by Letters Patent—

1. The mashing apparatus, consisting of the annular drum A, having separate chambers *a b c d*, &c., said chambers communicating by pipes $a^1$ $c^1$, &c., with the axle B of the drum A, and by pipes *o q r*, &c., with the mashing or masticating chamber G, substantially as and for the purpose herein shown and described.

2. The combination of the drum A with the masticating-drum G, masticating-wheel F, and one or more segments, *k l m n*, all so arranged that the drum A may be made to communicate directly with the masticating apparatus, substantially as specified.

This specification signed by me this the 28th day of July, 1877.

WILHELM VON SYDOW.

Witnesses:
CARL T. BURCHARDT,
CARL KROZELER.