No. 682,547. Patented Sept. 10, 1901.

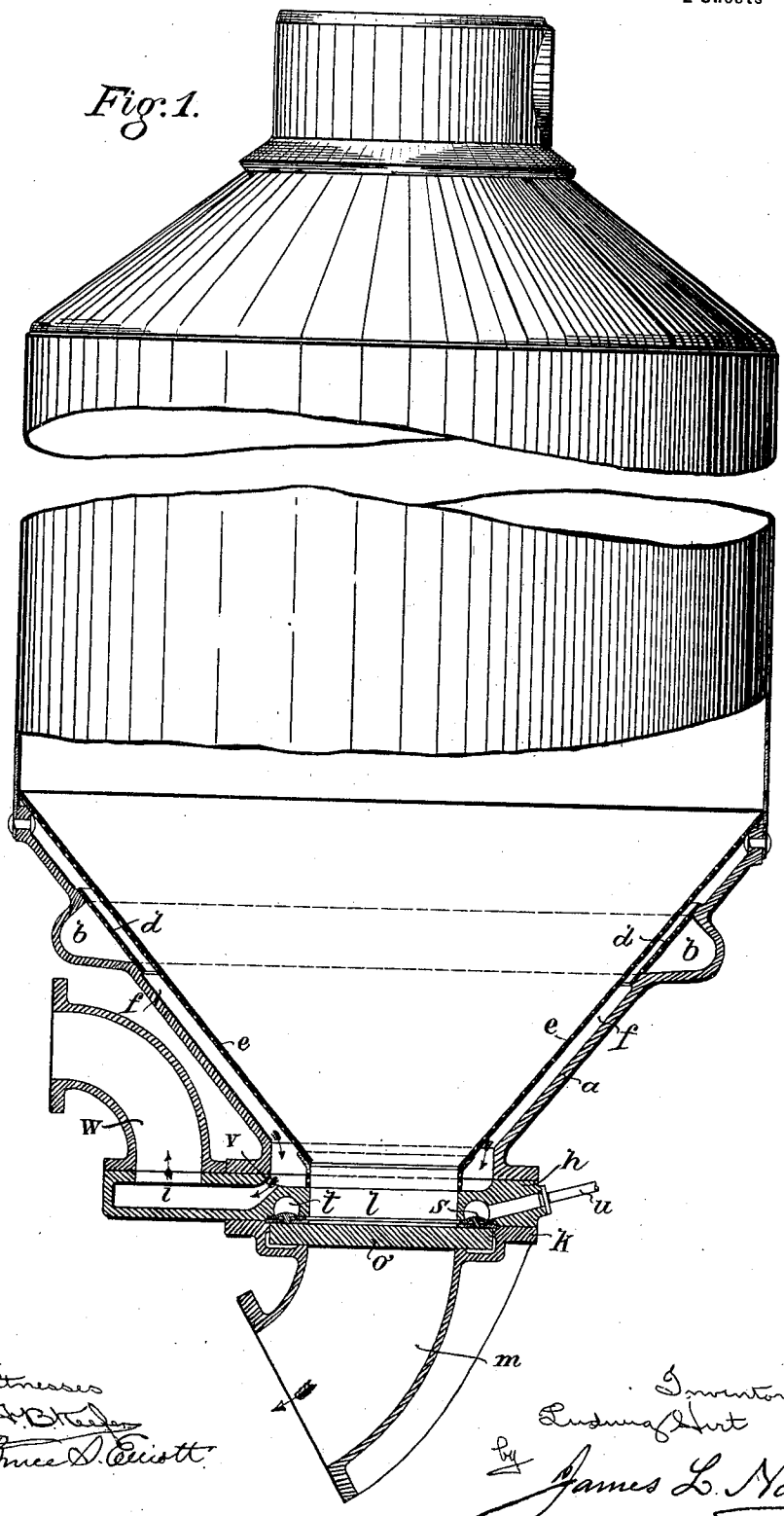
L. HIRT.

DIFFUSION APPARATUS.

(Application filed Feb. 23, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.



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DIFFUSION APPARATUS.

(Application filed Feb. 23, 1901.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 2.

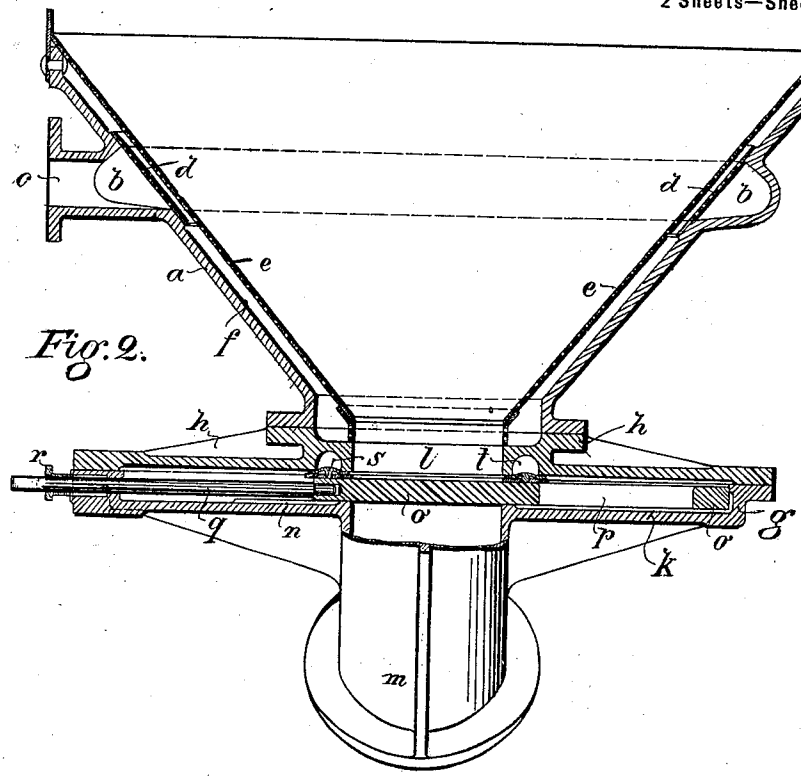


Fig. 3.

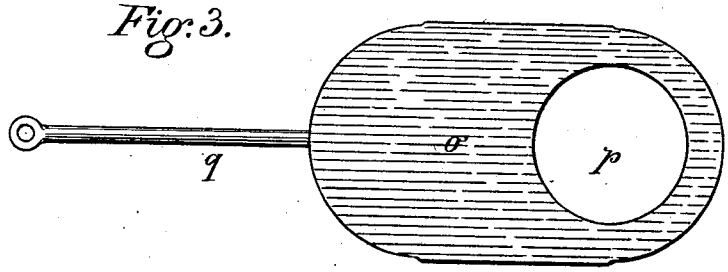
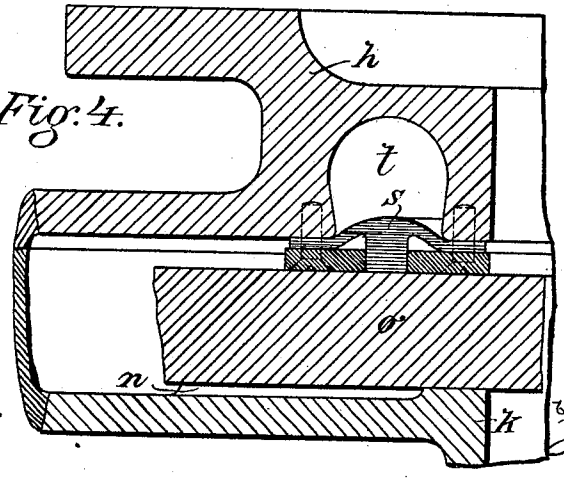


Fig. 4.



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UNITED STATES PATENT-OFFICE.

LUDWIG HIRT, OF GREVENBROICH, GERMANY, ASSIGNOR TO MASCHINEN-FABRIK GREVENBROICH, VORMALS LANGEN & HUNDHAUSEN, OF SAME PLACE.

DIFFUSION APPARATUS.

SPECIFICATION forming part of Letters Patent No. 682,547, dated September 10, 1901.

Application filed February 23, 1901. Serial No. 48,549. (No model.)

To all whom it may concern:

Be it known that I, LUDWIG HIRT, engineer, a subject of the King of Prussia, Emperor of Germany, residing at Grevenbroich, Rhine Province, Kingdom of Prussia, Germany, have invented certain new and useful Improvements in Diffusion Apparatus, of which the following is a specification.

The apparatus hereinafter described relates to a diffusion apparatus which enables an equal uniform extraction of the beet-root shreddings to be obtained and allows of a hermetic closing of the apparatus, an easy opening of the same, a rapid and complete discharge of the exhausted beet-root slices, and also the conveyance of the latter to a distant spot. These arrangements are contained in the lower part of the diffuser, which otherwise may be of any suitable construction.

In the drawings, Figure 1 is a section elevation of a diffusion apparatus involving my invention. Fig. 2 is a similar view of the lower part of the apparatus, the plane of the section being at right angles to that of Fig. 1. Fig. 3 is a plan view of the slide or valve, and Fig. 4 is an enlarged section showing more especially a packing for said slide.

Like characters refer to like parts in all the figures of the drawings.

The invention is shown in the accompanying drawings.

The lower part *a* of the diffuser or tank is conical in formation and open beneath. It has an annular channel *b*, on which a pipe-nozzle *c*, Fig. 2, is arranged, which serves for the introduction of a pressure medium, (compressed air or the like.) This annular channel *b* is shut off from the interior of the diffuser by means of a sieve or perforated metal plate *d*, the permeability of which becomes greater the farther it lies from the point where the pressure medium is introduced. This permeability will therefore be the greatest at the point opposite the nozzle or inlet-socket *c*. By this means the result is obtained that the medium of pressure can enter through the perforations into the diffuser in equal quantity and at the same speed.

A conical shell *e*, of perforated metal, is so arranged inside the conical part *a* of the diffuser that a space *f* is left between the diffuser and the shell *e*, which may be closed toward the lower part by the lid of a box or case *g*. This box *g* is firmly connected with the conical part *a* of the diffuser. It consists of a lid *h*, which contains a chamber or conduit *i*, Fig. 1, for carrying off the juice, and a bottom part *k*. Both together form the chamber for the closing mechanism. The case or box *g* has an opening *l*, which passes right through it, with the upper part of which the perforated shell or sieve *e* is connected, while beneath a pipe *m* is attached for carrying off the contents of the diffuser, which pipe may be carried to the place selected for depositing the slices or to a place where the slices are to be further treated.

The bottom of the case or box *g* has internal bars *n* or other suitable device on which a slide is mounted. This slide is provided with a perforation *p* the size of the opening *l*, as may be seen in Fig. 3, which shows a plan of the slide by itself. The slide *o* receives its movement from a rod *q*, rigidly connected with it and carried to the outside by a stuffing-box *r*. The rod *q*, and therewith the slide *o*, by means of suitable arrangements may also be operated from a distance in such a way that with the object of discharging the diffuser the opening *p* may be made to correspond with the opening *l* of the case or box and of the diffuser, while for closing the diffuser the full surface of the slide *o* may be made to be under the diffuser-opening *l*, as shown in Fig. 2.

In order to obtain a tight joint between the cover *h* and the slide *o*, an annular diaphragm or packing *s* is employed, which is secured in a suitable manner in the interior of the lid and which is made of an elastic material. The diaphragm thus shuts off an annular recess *t* on the inner side of the cover or lid *h*. If the pressure medium be introduced into this recess—for instance, by means of a pipe *u*—the diaphragm will press on the slide and form a strong joint. The diaphragm may be strengthened at the parts which come in contact with the slide—for instance, as shown in the drawings—as here some wear takes place. Fig. 4 shows this arrangement of the dia-

phragm and cross-section on an enlarged scale.

The chamber *i*, situated in the lid *h* for carrying off the juice, is connected on the one hand by a slot-shaped channel *v* with the chamber *f* and on the other hand with a discharge nozzle or pipe *w*, which is arranged at a suitable place on the lid. The juice is drawn equally from all parts of the diffuser down to the lowest point owing to the great area of perforation of the shell or sieve *e*, so that an even extraction of the juice is secured. The pipe conveying the juice to a farther diffuser or out of the diffusion plant is connected with the nozzle or pipe socket *w*. The diffusion apparatus is also provided with the usual pipes for introducing water, juice, and the like, which are not shown in the drawings, as they do not form the object of the invention.

The working of the diffuser is as follows: The extraction of the slices is effected in the ordinary manner, and the juice is carried off, as indicated, through the tapering perforated shell or sieve *e* to the chamber *i* for carrying off the juice and from this latter to the pipe connected with the socket *w*. When the diffusion is completed—that is to say, the last juice pressed out by means of water—the juice-conveying pipe is closed, and then the slide mechanism is opened. This is effected by the pressure in the annular recess *t* being removed, whereupon the slide *o* may be pushed forward by means of the rod so far that its opening *p* coincides with the opening *l*. The pressure medium is then conveyed into the passage *b* through the pipe *c*. This medium of pressure is evenly distributed, as hereinbefore described, by the perforated plate *d* into the chamber *f*. It acts through the shell or sieve *e* on the contents of the diffuser, agitates the latter, and conveys it to the desired place through the opened empty slide mechanism and the pipe *m*.

I declare that what I claim is—

1. In a diffusion apparatus, a tank having a tapered portion and an annular passage in such tapered portion provided with a supply-opening, a perforated sheet covering said passage, having its perforations of different sizes, and a perforated shell in said tapered portion tapered to correspond therewith and separated therefrom by an annular space.

2. In a diffusion apparatus, a tank having a tapered portion and an annular passage in such tapered portion provided with a supply-opening, a perforated sheet covering said passage, having its perforations of different sizes, a perforated shell in said tapered portion tapered to correspond therewith and separated therefrom by an annular space; and a box connected to the under side of said tank carrying a slide for controlling the discharge from said tank, said box having a discharge-channel in communication with said tank.

3. In a diffusion apparatus, a tank having a tapered portion and an annular passage in such tapered portion provided with a supply-opening, a perforated sheet covering said passage, having its perforations of different sizes, a perforated shell in said tapered portion tapered to correspond therewith and separated therefrom by an annular space; a box connected to the under side of said tank carrying a slide for controlling the discharge from said tank, said box having a discharge-channel in communication with said tank, said box having an annular channel above the slide, a packing between the slide and said annular channel, and means for directing a pressure medium to said channel.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

LUDWIG HIRT.

Witnesses:
CARL ARND,
FRIEDRICH GEILHAAR.