F. ZORN.

DRYING APPARATUS.

APPLICATION FILED MAY 19, 1913.

1,120,879.

Patented Dec. 15, 1914.

2 SHEETS—SHEET 1.

Fig. 1

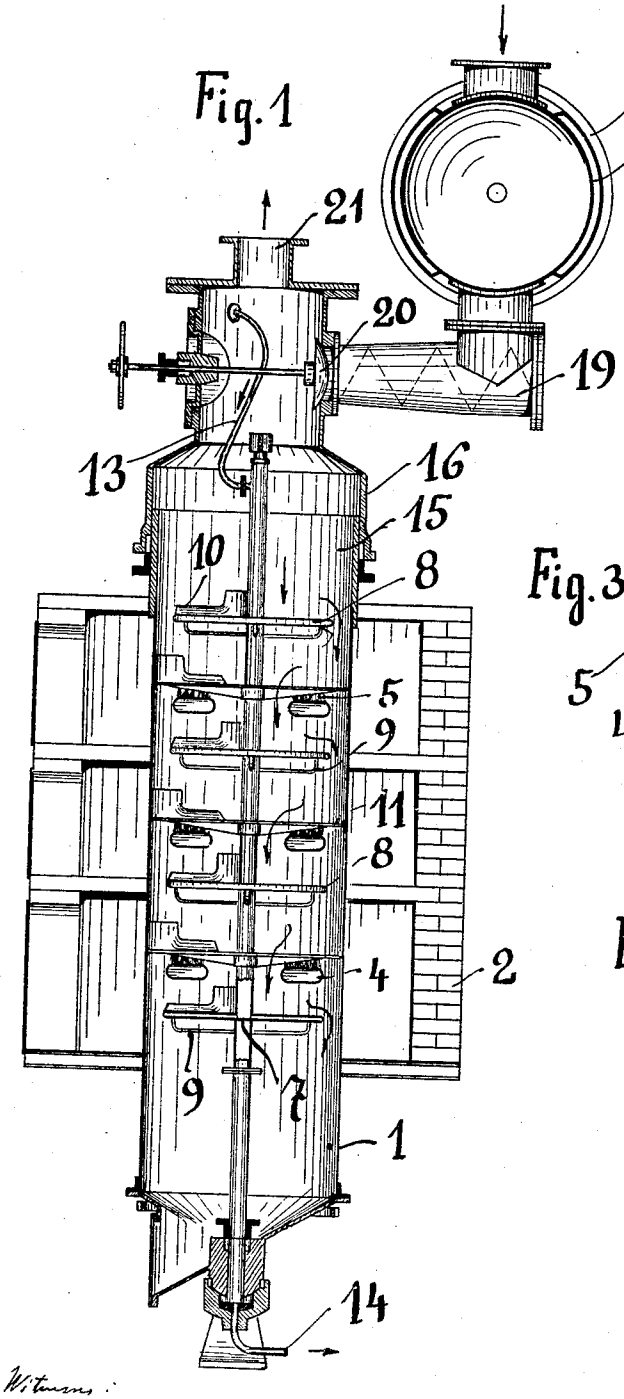


Fig. 2

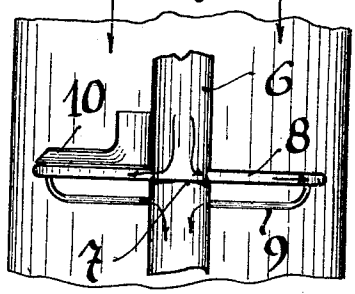


Fig. 3

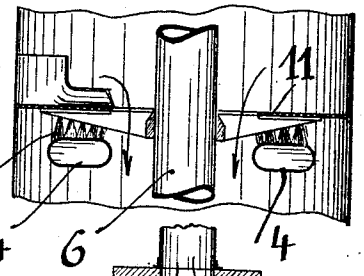
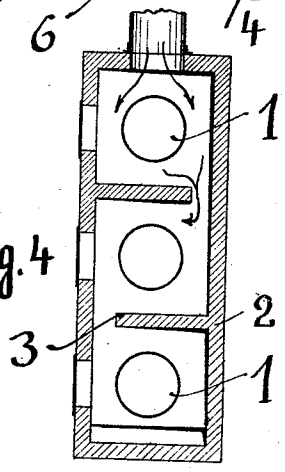


Fig. 4



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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2 SHEETS—SHEET 2.

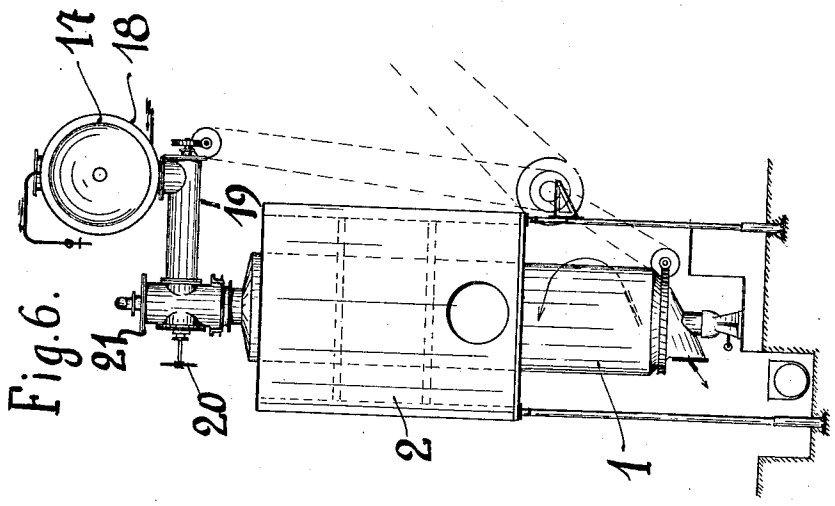


Fig. 6.

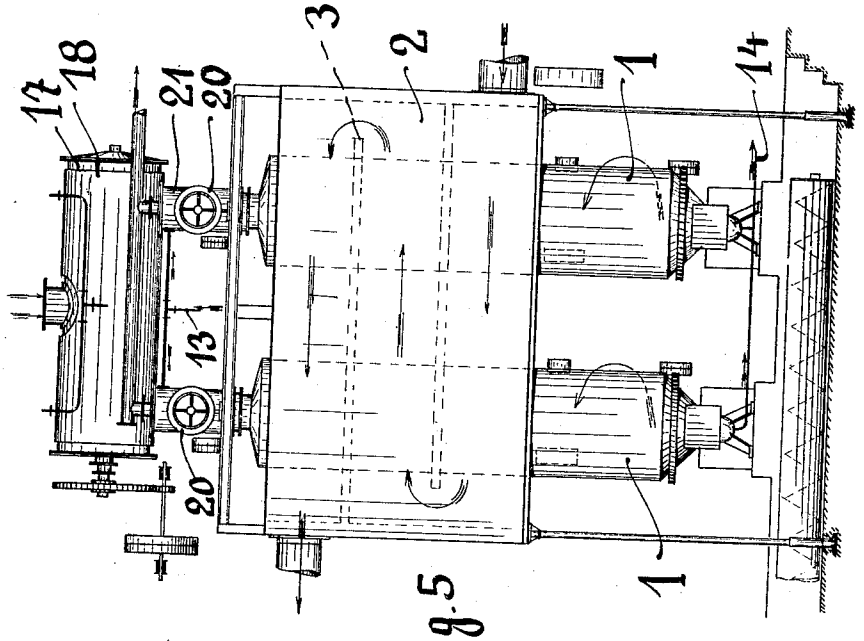


Fig. 5

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UNITED STATES PATENT OFFICE.

FRITZ ZORN, OF FIENSTEDT, GERMANY.

DRYING APPARATUS.

1,120,879. Specification of Letters Patent. Patented Dec. 15, 1914.

Application filed May 19, 1913. Serial No. 768,605.

To all whom it may concern:

Be it known that I, FRITZ ZORN, a subject of the King of Prussia, German Emperor, residing at Fienstedt, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Drying Apparatus, of which the following is a specification.

This invention relates to a drying apparatus for granular and such materials which can be manipulated with shovels, such as for example turnip chips, corn or the like.

The drying apparatus is constructed in such a manner that the drying cylinders proper, which work under vacuum are traversed by flame tubes which are arranged so that the material to be dried does not come in contact with the flames.

In the accompanying drawings the invention is shown by way of example:—

Figure 1 is an elevation of the apparatus partly in section. Fig. 2 shows the hollow shaft with the steam plates. Fig. 3 shows the sieve plates with the flame tubes. Fig. 4 illustrates diagrammatically the arrangement of the drying cylinders mounted in a common casing which has baffle plates for the heating gases and flames. Fig. 5 is a front elevation of two cylinders feeding the driers. Fig. 6 is a side elevation of Fig. 5.

The drying apparatus essentially consists of vertical cylinders 1 which are closed air tight and arranged in a casing 2 preferably made of brick. Baffle plates 3 are arranged in said casing between the cylinders 1 so that the heating gases and flames are conducted through the apparatus in zig-zag, and brought in contact with all the parts of the cylinder walls. The cylinders 1 have transverse flame tubes 4 which are arranged directly under the sieves 11 and closed so that the flames and smoke are prevented from coming in contact with the material to be dried. The stays of the sieve plates have brushes 5 which brush off the dust from the flame tubes when the cylinders revolve.

The cylinders are mounted upon hollow shafts 6 to which steam is supplied by a tube 13. In the hollow shafts 6 horizontal partitions 7 are arranged which divide the same into separate compartments. The compartments of the hollow shaft are connected the one with the other by horizontal steam plates to which the steam is conducted by means of small tubes 9. The steam and water from condensation flow out at the lower end of the hollow shaft through a tube 14. Owing to the arrangement of the horizontal steam plates 8 the heat of the steam is completely utilized. Upon the steam plates 8 near the inner edge of the same rakes 10 are arranged, similar rakes 12 being arranged over the outer edges of the sieves 11. The steam plates 8 and the sieve plates 1 alternate so that the material is conducted from the inner edge of the sieve plates to the outer edge of the steam plates.

The drying cylinders 1 are made from wrought iron and they are mounted at the lower end in ball bearings. Their upper ends being revolubly mounted in a stuffing box 16. At the top of the apparatus a tubular socket 21 is arranged through which the moist air is sucked off.

A feeding cylinder 17 is horizontally arranged at the top end of the drying apparatus which is inclosed in a double wall 18 and serves for the preliminary heating of the material to be dried. This feeding cylinder 17 is connected with each drying cylinder by conveyer screws 19.

The drying apparatus operates as follows: From the feeding cylinder 17 the material to be dried is fed to the several drying cylinders 1 by means of the conveyer screws 19, the traps 20 of which are open. In the cylinders 1 the drying material drops successively from the steam plates upon the sieve plates and so on. The flames are conducted around the drying cylinders and through the flame tubes 4. The moist steam coming from the dried materials traverses all the sieve plates and the material upon the same.

I claim:—

Drying apparatus for granular and such material which can be manipulated by shovels comprising in combination a casing of brick work, vertical drying cylinders revolubly mounted in said casing, horizontal baffle plates between said cylinders, flame tubes traversing said cylinders, a hollow shaft for each drying cylinder, horizontal partitions in said hollow shafts, horizontal steam plates above said horizontal partitions, tubes connecting each lower compartment of the hollow shaft with the upper steam plate, rakes upon said steam plates,

horizontal sieve plates mounted between said steam plates and above said flame tubes, rakes upon the upper surface of said sieve plates, brushes at the lower surface of said sieve plates for brushing said flame tubes, a common feeding cylinder, and conveyer screws connecting said feeding cylinder with the vertical drying cylinders, substantially as described and shown and for the purpose set forth.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

FRITZ ZORN.

Witnesses:
MAX NAGEL,
ARTHUR J. BUNDY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."