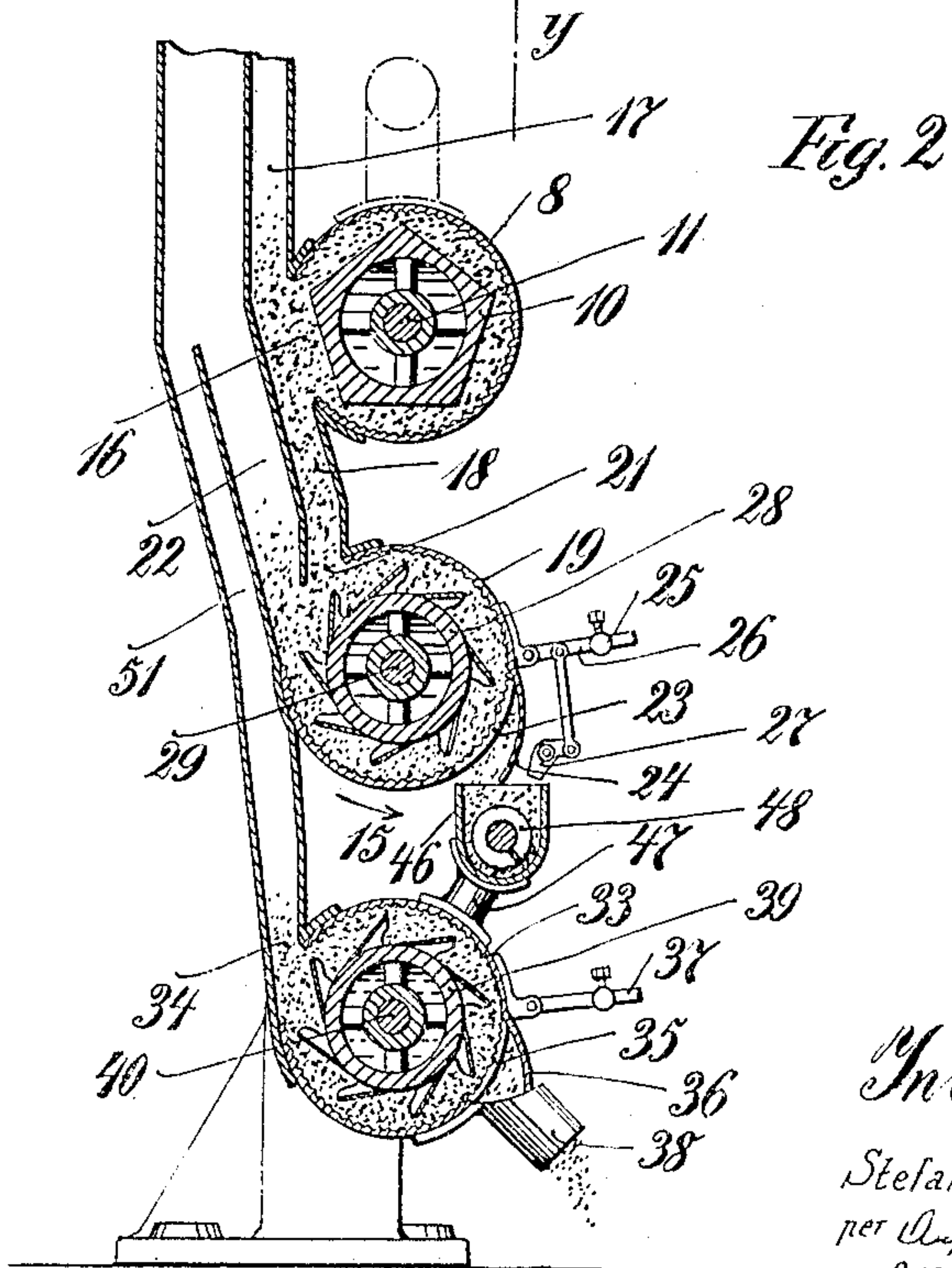
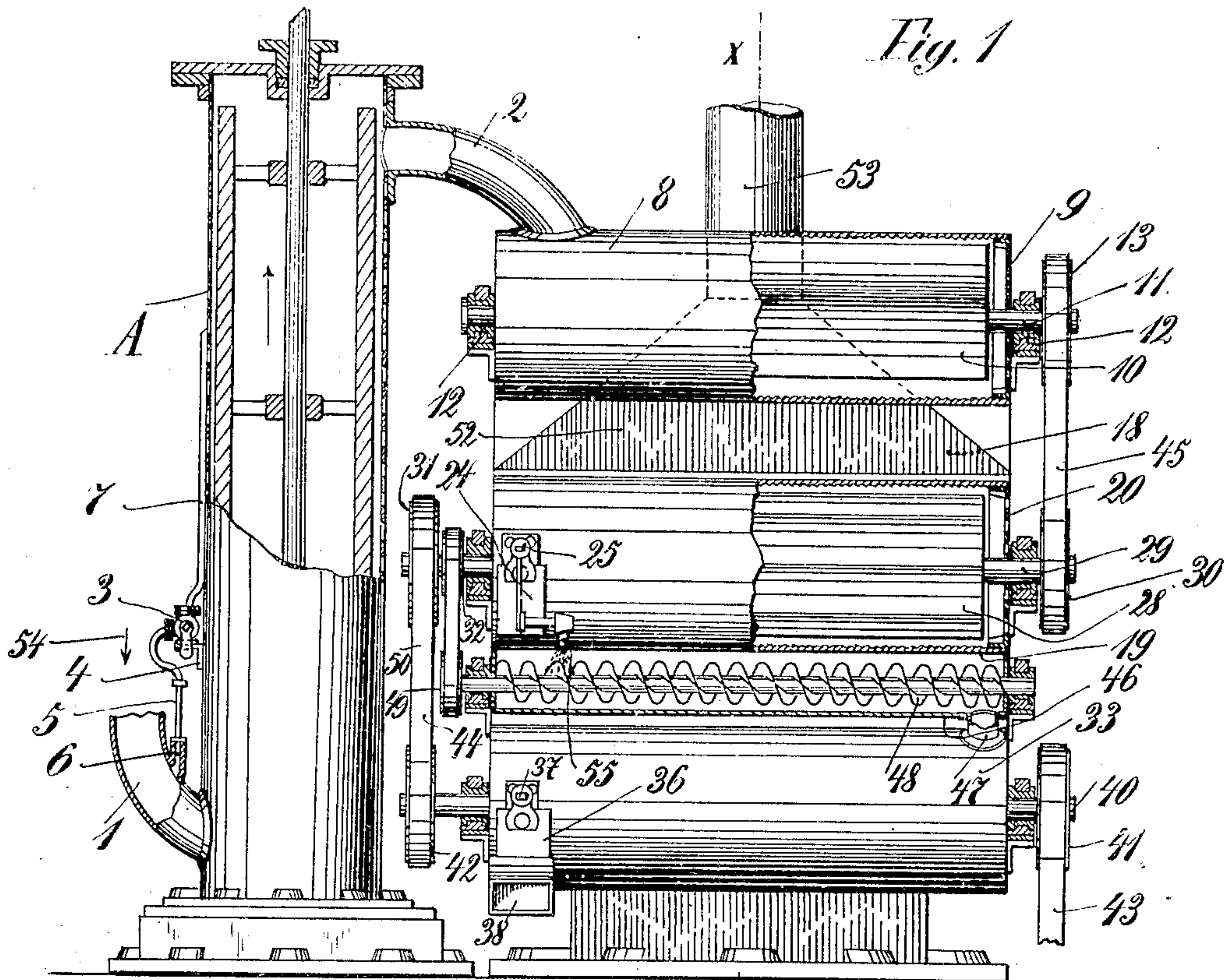


No. 875,863.

PATENTED JAN. 7, 1908.

S. STEINMETZ.
HUSKING MACHINE.

APPLICATION FILED FEB. 13, 1905.



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STEFAN STEINMETZ, OF KREUZNACH, GERMANY.

HUSKING-MACHINE.

No. 875,863.

Specification of Letters Patent.

Patented Jan. 7, 1908.

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To all wh m it may concern:

Be it known that I, STEFAN STEINMETZ, a citizen of the Empire of Germany, residing at Kreuznach, in the Empire of Germany, have invented a new and useful Husking-Machine, of which the following is a specification.

My invention relates to improvements in husking machines, whereby the machines are simplified and rendered more effective. The grain is first moistened and then partly husked, afterwards freshly moistened, wholly husked and finished, while it need not be passed repeatedly through the same parts of the machine as hitherto. Thus the grain is treated in two consecutive stages and the second moistening device is made adjustable according to the quantity of grain treated in the first stage.

I will now proceed to describe the improved husking machine with reference to the accompanying drawing, in which—

Figure 1 is an elevation of the machine, parts being shown in section, and Fig. 2 is a vertical cross section on the broken line $x-y$ in Fig. 1.

Similar characters of reference refer to similar parts in both views.

The first moistening device comprises a vertical centrifugal machine A of any known construction, which is connected at the bottom with a supply tube 1 and at the top with a discharging tube 2. A two-way cock 3 is secured on a convenient support 4 and connected with a tube 5, the lower end of which enters a channel 6 in a boss on the tube 1. The two-way cock 3 is connected with some source of water by a tube 7. The tube 1 is to be connected with some hopper or other known device for the introduction of the grain. I do not further describe the vertical centrifugal machine A, as its construction is immaterial, the essential point being, that the moistened grain should be therein gradually moved upward while the dirty water is being thrown off. The discharging tube 2 is adapted to conduct the wet grain from the top of the vertical centrifugal machine A to a first horizontal cylinder 8. The internal cylindrical surface of the latter is made rough, it being provided with small projections of any convenient shape, *vide* for instance Figs. 1 and 2. The two heads 9, 9 of the cylinder 8 are preferably perforated for the admission of air.

Within the cylinder 8 a rubbing drum 10

of a polygonal cross section, preferably a pentagon or hexagon, is disposed, whose shaft 11 passes through both heads 9, 9 and is mounted in suitable bearings 12, 12 to turn. On an external end of the shaft 11 is keyed a belt pulley 13, by means of which the drum 10 can be put into rotation in the direction of the arrow 15 in Fig. 2. The drum 10 is so proportioned, as to leave ample spaces of segmental cross section within the cylinder 8. The latter is provided with an aperture 16, through which it is placed in communication with an upper channel 17 and a lower channel 18. Beneath the first cylinder 8 a second horizontal cylinder 19 is disposed, which has equally a rough internal surface. It is provided with two perforated heads 20, 20 and has a longitudinal aperture 21 of a convenient width. Through this aperture 21 the cylinder 19 is put in communication with the channel 18 mentioned above and also with a channel 22 behind the channel 18.

At the left end the cylinder 19 is provided with an aperture 23, which is normally closed by a trap-door 24, the latter being balanced or pressed by a weight 25 on a lever 26 with the aid of a bell-crank lever 27 and two links shown at Fig. 2. Within the second cylinder 19 a husking drum 28 with a plurality of inclined wings is fastened on a shaft 29, which passes through both heads 20, 20 and carries on its right external end a belt pulley 30 and on its left end two belt pulleys 31 and 32. The shaft 29 is mounted in suitable bearings to turn in the same direction as the upper drum 10. The wings of the husking drum 28 are shown in Fig. 1, as straight or, in other words, parallel with the shaft 29, but, where so preferred, they may be made slightly helical. Beneath the second cylinder 19 a third horizontal cylinder 33 is disposed, which has a rough internal surface, two perforated heads similar to those 9, 9 and 20, 20 of the upper cylinders respectively, a longitudinal aperture 34 and at the left end an aperture 35, which is normally closed by a trap-door 36, the latter being balanced or pressed by a weighted lever 37.

Beneath the aperture 35 an outlet piece 38 of rectangular cross section is secured on the cylinder 33. Within the third cylinder 33 a husking drum 39 of a similar construction as the drum 28 above is fastened on a shaft 40, which passes through the two heads and is mounted in suitable bearings to turn. It

carries on the ends two belt pulleys 41 and 42, of which the right one 41 can be driven from some source of power (not shown) by means of a belt 43. As the belt pulleys 42 and 31 of the two husking drums 39 and 28 are connected by a belt 44 and the belt pulleys 30 and 13 of the upper husking drum and the rubbing drum are connected by a belt 45, it follows, that all the three drums are simultaneously driven in the same direction of the arrow 15 by the driving belt 43. Between the second and third cylinders 19 and 33 the second moistening device is disposed. It comprises a horizontal trough 46 with a conveyer 48 and a water cock 55. The horizontal trough 46 is placed beneath the outlet 23 of the second cylinder 19. At the right end this trough 46 communicates with the lowermost cylinder 33 through a tube 47. Within the trough 46 the conveying screw 48 is disposed, the shaft of which is mounted in suitable bearings to turn and carries on its left end a belt pulley 49, so that it can be driven from the pulley 32 by means of a belt 50.

Above the trough 46 near the trap-door 24 the water cock 55 is disposed, whose plug is rigidly connected with the bell-crank lever 27 mentioned above. The cock 55 is connected with the source of water by means of a tube (not shown), which may be attached to the water tube 7 or left separate. It will be seen, that the plug of the cock 55 is so connected with the trap-door 24 as to regulate the amount of water discharged into the trough 46 in proportion to the quantity of grain falling from the second cylinder 19 through the aperture 23. The three superposed cylinders 8, 19 and 33 are secured in a frame of any convenient construction. The third cylinder 33 is placed in communication through its aperture 34 with a channel 51 behind the channel 22 already referred to above. The three channels 51, 22 and 18, 17 may be arranged in a casing 52, which tapers upward and terminates in a tube 53. The latter may either lead upward into the atmosphere or be connected with an exhaust fan (not shown). The vertical centrifugal machine A may be driven in any known manner (not shown).

The whole apparatus operates as follows: It is put into motion and the grain is introduced in the direction of the arrow 54 in Fig. 1 through the supply tube 1. The cock 3 of the first moistening device is opened to turn on water, which passes through the tube 5 and the channel 6 and mixes with the grain. The watered grain is passed upward through the vertical centrifugal machine in any known manner while describing a spiral line and being freed from the dirty water. The wet grain then passes through the tube 2 to the upper cylinder 8, where it is taken along with by the pentagonal drum 10. As during

the rotation of the drum 10 the sectional spaces between it and the cylinder 8 constantly change their position, it follows, that the grain is constantly pressed by the flat drum faces against the rough internal surface of the cylinder 8, so that the several grains of the grain are forced to rub not only on each other, but also on the internal cylinder surface and on the flat drum faces. Thereby the water adhering to the several grains is forced between their husks and berries, so that the husks are loosened. The drum 10 acts at the same time somewhat like a ventilator as it sucks a little air through the perforations of the heads 9, 9 and mixes it with the grains. The grain is constantly taken along with by the drum and rubbed, until it at last drops through the aperture 16 into the diverging channel 18. Any husks that may have been detached from the berries may be partly or wholly carried upward through the channel 17 to the exhaust fan, if any be employed. The rubbed grain passes through the channel 18 to the second cylinder 19, where the several grains are again taken along with by the wings of the husking drum 28 and rubbed against the rough internal surface of the cylinder 19. The husking drum 28 acts at the same time as a ventilator, but in a stronger degree than the rubbing drum 10, it sucking in air from without through the perforations of the heads 20, 20 and mixing the air with the grain. Thereby the several grains are not only dried but also partly husked. The detached husks are blown upward in the direction of the arrow through the channel 22. An exhaust fan may be useful to facilitate the discharge of the husks. The grains are constantly thrown about and treated by the wings of the husking drum 28 while describing a spiral line from right to left in Fig. 1 until they force open the trap-door 24 and fall in a stream into the trough 46. The motion of the grains through the cylinder 19 from right to left in a spiral line may be facilitated by placing the wings of the drum 28 slightly helically as explained above.

Of course the outward motion of the trap-door 24 is communicated to the plug of the cock 55, whereby the latter is opened and a quantity of water in proportion to that of the falling partly husked grains is constantly admitted to the trough. In the latter the grain is again moistened, while it is being conveyed from left to right by the conveyer 48, until it drops through the tube 47 into the third cylinder 33. Here the freshly moistened grains are finished, that is to say, they are rubbed by the wings of the second husking drum, freed from the last husks, dried and polished, while gradually moving from right to left in a spiral line, until the husked grains force open the trap-door 36 and escape through the outlet 38 to some place of stor-

age or to further machines as the case may be. The husks and the dirt are discharged upwards through the channel 51.

The husking machine described may be varied in many respects without deviating from the spirit of my invention. It is essential, that the first cylinder 8 and the rubbing drum 10 should be adapted to force the adhering water between the husks and the berries of the grain for loosening the husks. The second cylinder 19 and the husking drum 28 should be adapted to partly husk the grain. The third cylinder 33 and the husking drum 39 in combination with the second moistening device should finish the grain.

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

1. In a husking machine, the combination with a first moistening device, of a rotatory rubbing drum of a polygonal cross section (preferably a pentagon or a hexagon) adapted to force the water between the husks and berries of the grain, means conducting the moistened grain from said first moistening device to said rotatory rubbing drum, a first rotatory husking drum, means conducting the rubbed grain from said rotatory rubbing drum to said first rotatory husking drum, a pressed trap-door, a second moistening device controlled by said pressed trap-door, a second rotatory husking drum, a pressed trap-door adapted to discharge the finished husked grain, and means for removing the detached husks.

2. In a husking machine, the combination with a first moistening device, of a rotatory rubbing drum of a polygonal cross section (preferably a pentagon or a hexagon) within a horizontal cylinder with rough internal surface, means conducting the moistened grain from said first moistening device to said ro-

tatory rubbing drum, a first rotatory husking drum within a second horizontal cylinder with rough internal surface and perforated heads, means conducting the rubbed grain from said rotatory rubbing drum to said first rotatory husking drum, a pressed trap-door in said second horizontal cylinder, a second moistening device beneath said pressed trap-door and controlled thereby, a second rotatory husking drum within a third horizontal cylinder with rough internal surface and perforated heads, means conducting the freshly moistened grain from said second moistening device to said second rotatory husking drum, a pressed trap-door in said third horizontal cylinder, and an outlet, said two husking drums being adapted to suck in air from without through the perforations in the cylinder heads and to discharge the husks.

3. In a husking machine, the combination with a horizontal cylinder for a first husking drum, of a trap-door in said horizontal cylinder, a horizontal trough placed with its one end beneath said trap-door, a screw conveyor mounted in said horizontal trough to turn, an outlet at the other end of said horizontal trough, a water cock near said trap-door, a connection between said water cock and a source of water, means for pivotally connecting said trap-door with the plug of said water cock, and means for normally closing said trap-door with a yielding pressure.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

STEFAN STEINMETZ.

Witnesses:

WALTER HAUSING,
WALTER SCHUMANN.