T. CAIN.

DUST GUARD.

APPLICATION FILED NOV. 18, 1920.

1,395,701.

Patented Nov. 1, 1921.

2 SHEETS—SHEET 1.

Fig. I.

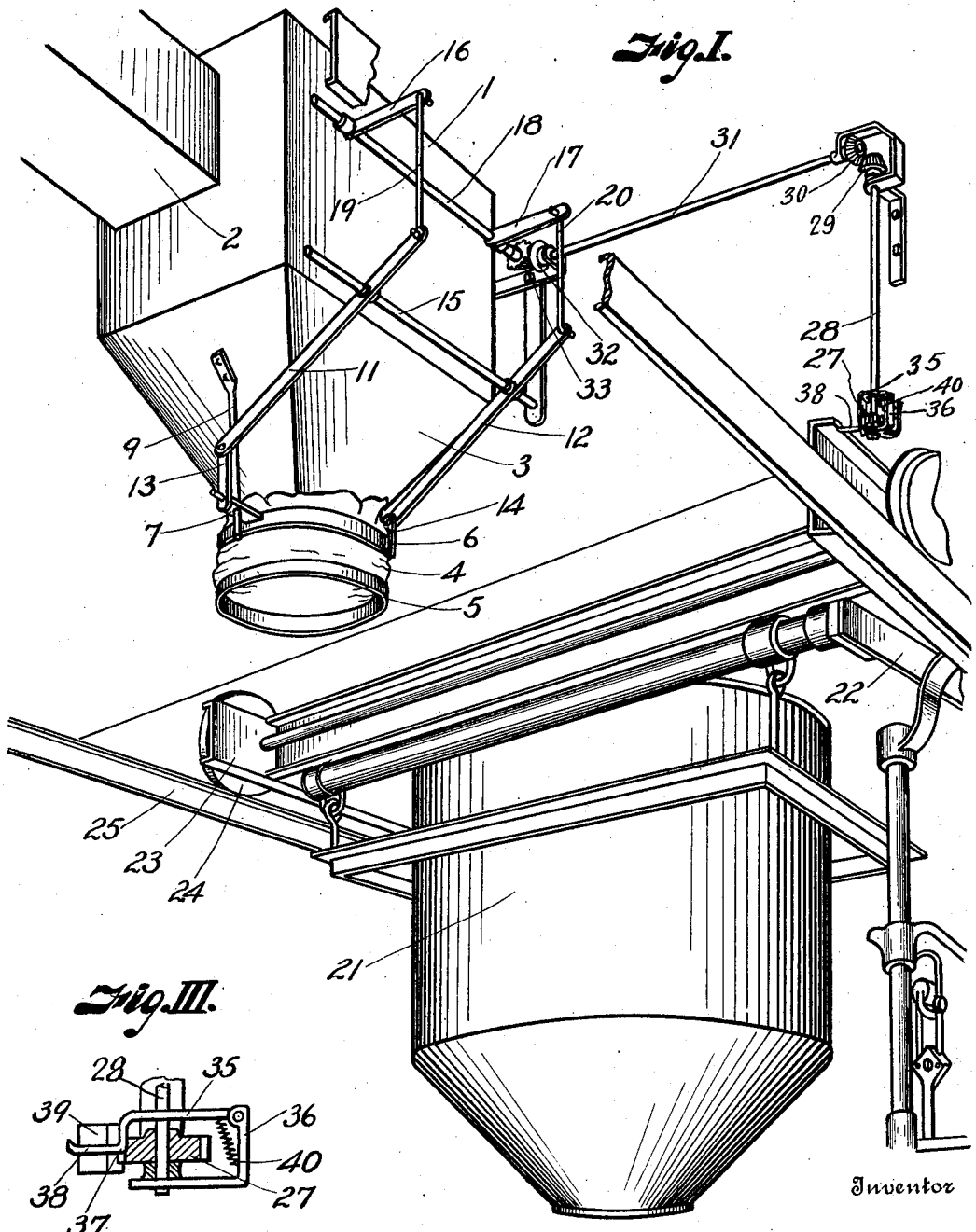


Fig. III.

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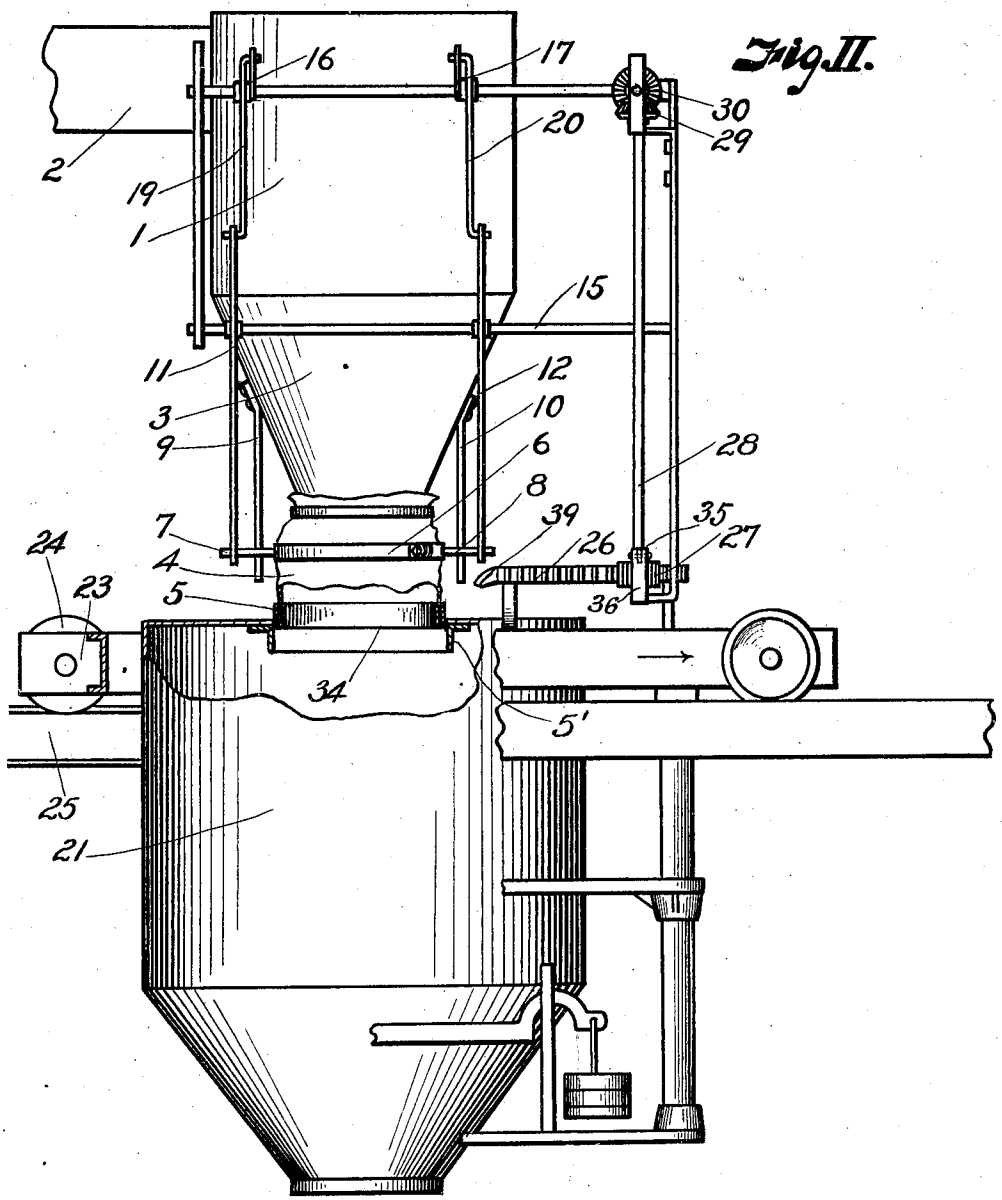
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2 SHEETS—SHEET 2.

Fig. II.



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UNITED STATES PATENT OFFICE.

THOMAS CAIN, OF TOPEKA, KANSAS.

DUST-GUARD.

1,395,701. Specification of Letters Patent. Patented Nov. 1, 1921.

Application filed November 18, 1920. Serial No. 424,859.

To all whom it may concern:

Be it known that I, THOMAS CAIN, a citizen of the United States, residing at Topeka, in the county of Shawnee and State of Kansas, have invented certain new and useful Improvements in Dust-Guards; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to an automatically controlled dust guard to be used where material is fed from one receptacle to another, the primary object being to automatically move the guard into and out of operative position, as the occasion may demand.

The invention is particularly applicable for use in connection with bakeries where the flour is discharged from a receptacle or sifter to a weighing receptacle. In such cases it is desired that the flour be not contaminated by having dust or extraneous matter enter the flour stream as it passes from the sifter to the weighing receptacle.

It is also an object of the invention to prevent the flour from spilling as it is being transferred from the sifter to the receiving receptacle.

I have, therefore, provided means whereby the sifter receptacle may be so connected to the receiving receptacle of the scale that all outside dust and extraneous matter will be excluded and this is accomplished by means of an extensible spout which has connected to it automatically controlled mechanism to lift the end of the extensible spout away from the receiving hopper when the receiving receptacle is to be moved out of line with the sifter or discharging receptacle.

One form of my invention is illustrated in the accompanying drawings, in which—

Figure I is a perspective view of a discharging receptacle and receiving receptacle, the latter being out of line with the former but shown as moving into alining position.

Fig. II is a view partly in elevation and partly in section of the two receptacles in alinement, with the extensible spout or chute in operative position, and

Fig. III is a sectional view through a detent device for holding certain mechanism rigid to maintain the extensible spout in its retracted position or out of operative position.

The discharge receptacle may consist of a sifter designated by the reference numeral 1. The sifter is adapted to receive the material from a supply chute or trough 2. The discharge end of the discharge receptacle 1 is provided with a hopper bottom 3, on which is an extensible and contractible spout or chute 4, consisting of a flexible tubular member having at its lower end a rigid ring or collar 5 and at its upper end a similar collar 6 is provided. The ring 6 carries outstanding brackets 7 and 8 through which project guide rods 9 and 10, depending from the bottom 3 of the discharge receptacle 1. The brackets 7 and 8 are also connected to rocking lever arms 11 and 12 by means of links 13 and 14, the levers being rockable about the axis of a shaft 15, which supports them, and said levers straddle the hopper bottom 3, as clearly shown in Figs. I and II.

The upper ends of the levers 11 and 12 are connected to cranks 16 and 17 on the rock shaft 18 by links 19 and 20. The shaft 18 is adapted to be rocked through the medium of certain mechanism controlled by the movement of the receiving receptacle or scale, to which it is secured so that when the receiving receptacle moves into alinement with the discharge receptacle, the link and lever mechanism just described will become effective to move the chute or nozzle into operative position or, in other words, to seat its lower end upon the receiving receptacle so that an inclosed passage is provided between the discharge receptacle 1 and the receiving receptacle into which it discharges.

The receiving receptacle shown as the load-receiving member of the scale is designated by the reference numeral 21 and it is mounted upon the scale beam 22 carried by a carriage 23, the wheels 24 of which ride on the tracks or beams 25 beneath the discharge end of the receptacle 1. The carriage 23 carries a horizontal rack 26 adapted to move into and out of engagement with a pinion 27 on the vertical shaft 28 mounted in suitable bearings and carrying at its upper end a gear 29 meshing with a gear 30 on a horizontal shaft 31, which is provided with a gear 32 meshing with a gear 33 on

the rock shaft 18. Therefore, when the receiving receptacle 21 moves into alinement with the discharge receptacle 1, the rack will have moved into engagement with the pinion 27 long enough to impart a rotative movement to the shaft 28 and, through shaft 31 and its gears, the rock shaft 18, so that the upper ends of the levers 11 and 12 are raised and the lower ends depressed. Since the collar 6 is connected to the levers 11 and 12, the collar or ring 5 will have moved into alinement with the opening 34 in the hopper 21; that is, the ring 5 will be seated upon the top of the receptacle 21 so that communication with outside atmosphere will be closed off and liability of dust, dirt or other foreign substances contaminating the flour as it passes from the receptacle 1 to the receptacle 21 will be eliminated.

When the carriage moves away from the hopper 1, the rack will impart rotative movement to the shaft 28 in an opposite direction to that described and, through the shaft 31 and its gears, impart a rocking movement to the shaft 18 so as to depress the upper ends of the levers 11 and 12 and raise the lower ends thereof; consequently, the chute or spout 4 will be raised out of seating position.

It is desirable that some means be provided for maintaining the spout in its raised position when no receiving receptacle is beneath the discharge end thereof. To this end I have provided a detent consisting of a pawl 35, which is pivoted to a bracket 36 on a suitable support and the detent 35 is provided with an angular end 37 having a projection or finger 38 which is adapted to ride up the cam end 39 of the rack 26. The detent or the portion 35 thereof is adapted to engage between the teeth of the pinion 27 and is normally urged to this position by the tension spring 40. The portion 35 is normally in engagement with the pinion 27 so that the ring 5 is held high enough above the plane in which the top receptacle 21 will pass that it will not come in contact with the top receptacle until the opening 34 has moved into alinement with the discharge end 1. As the carriage moves along the track to bring the receptacle 21 into alinement with the receptacle 1, the cam 39 of the rack 26 will lift the end 38 of the detent or pawl 35 out of engagement with the pinion and at the same time the rack teeth will mesh with the teeth of the pinion 27 and begin to turn it, imparting movement to the shaft 28, the shaft 31 and rocking the shaft 18, as above described. Thereupon, the ring 5 will seat on the top receptacle 21. When the receptacle 21 has moved out of alinement with receptacle 1, the rack 26 will first rotate the shaft 28 to raise the ring 5 and as the rack moves away from the pinion 27, the finger 38 will slide off the cam 39 and permit the detent to snap into engagement with the pinion between two of its teeth so as to hold the shafts 28, 31 and 18 from turning and thereby retain the ring 5 above the plane of the top receptacle 21, where it will remain until the shaft 28 is again turned by the rack 26, which can only be accomplished when the carriage is moving toward the receptacle 1.

From the foregoing it will be apparent that communication between the receptacles 1 and 21 may be automatically effected in such a manner that there will be substantially a continuous contact between the two hoppers and the connections will be such that liability of dust entering the receptacle or any of the flour spilling in transit from the receptacle 1 to the receptacle 21 will be prevented.

It will also be apparent that since the ring 5 may telescope into the guide ring 5′ carried by the load-receiving member 21, liability of the flour spilling will be prevented.

What I claim and desire to secure by Letters-Patent is:

1. A receptacle, an extensible and contractible discharge spout for said receptacle, a receptacle movable into and out of alinement with the first named receptacle, means carried by the first named receptacle to cause expansion and contraction of the spout, and means on the second named receptacle for actuating the first named means.

2. A receptacle, an extensible and contractible discharge spout for said receptacle, a receptacle movable into and out of alinement with the first named receptacle, means carried by the first named receptacle to cause expansion and contraction of the spout, means on the second named receptacle for actuating the first named means, and means for normally holding the spout against movement.

3. A stationary receptacle having a flexible discharge spout, a laterally movable receptacle, means for moving the second mentioned receptacle into and out of alinement with the spout of the first receptacle, a spout end raising and lowering mechanism carried by the first mentioned receptacle, and means on the second mentioned receptacle for actuating the spout raising and lowering mechanism.

4. A stationary receptacle having a flexible discharge spout, a laterally movable receptacle, means for moving the second mentioned receptacle into and out of alinement with the spout of the first receptacle, a spout end raising and lowering mechanism carried by the first mentioned receptacle, means on the second mentioned receptacle for actuating the spout raising and lowering mechanism, a pawl normally holding the spout raising and lowering means out of actuation,

and means for releasing said pawl when the means on the second receptacle comes into operative connection with the first named means.

5. A stationary receptacle having a discharge opening, a flexible spout surrounding the discharge opening and depending from the receptacle, a link mechanism for raising and lowering the lower end of said spout comprising levers, a rock shaft and a pinion, a receiving receptacle movable into and out of alinement with the discharge end of the stationary receptacle, means for supporting said receiving receptacle, and a rack carried by said supporting means and engageable with the pinion to actuate the rock shaft and levers to raise and lower the lower end of the spout.

6. A stationary receptacle having a discharge opening, a flexible spout surrounding the discharge opening and depending from the receptacle, a link mechanism for raising and lowering the lower end of said spout comprising levers, a rock shaft and a pinion, a receiving receptacle movable into and out of alinement with the discharge end of the stationary receptacle, means for supporting said receiving receptacle, a rack carried by said supporting means and engageable with the pinion to actuate the rock shaft and levers to raise and lower the lower end of the spout, a detent, means on the detent for engagement with the spaces between the teeth of the pinion, and means on the rack for throwing the detent out of engagement with the pinion.

In testimony whereof I affix my signature.

THOMAS CAIN.