Nov. 10, 1942. S. J. ROBISON 2,301,815

PULVERIZED MATERIAL SAMPLER

Filed Nov. 8, 1940

FIG. 2.

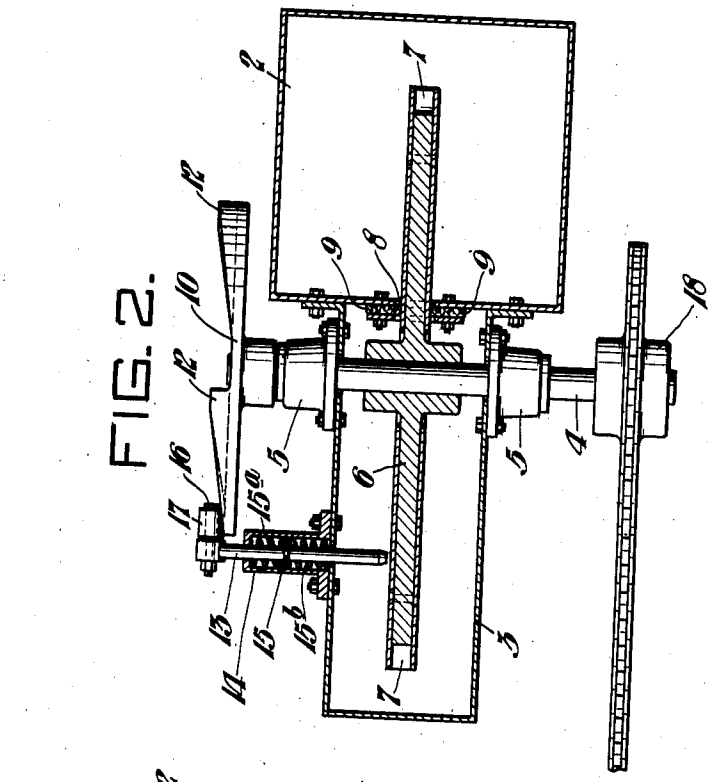
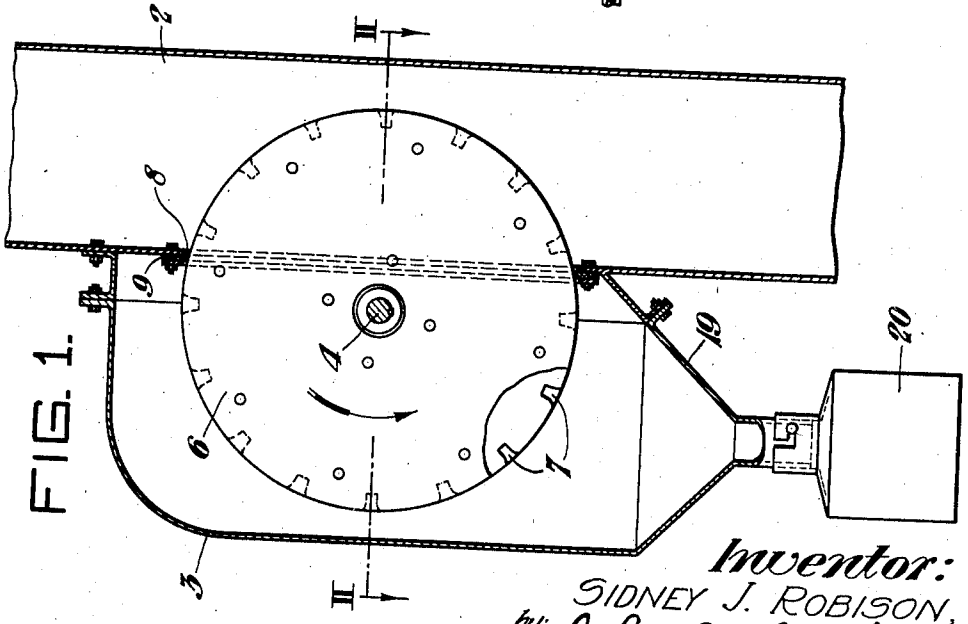


FIG. 1.



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PULVERIZED MATERIAL SAMPLER

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4 Claims. (Cl. 73—21)

This invention relates to a means for obtaining samples of pulverized material, and particularly to an improved apparatus for collecting various materials in powdered form, such as cement samples and the like.

It is the general object of the present invention to provide an improved apparatus for continuously obtaining a representative sample from a flowing stream of pulverized material and the like.

It is another object of the invention to provide an improved apparatus for continuously sampling pulverized material and the like which is simple and inexpensive in its construction and, at the same time, one that is efficient and effective in its use.

It is a further object of this invention to provide an improved apparatus for continuously sampling pulverized material and the like which is strong and rugged in its construction and yet an apparatus which can be conveniently and quickly incorporated with existing material conveying mechanism.

Various other objects and advantages of this invention will become more apparent in the course of the following specification, and will be particularly pointed out in the appended claims.

In the accompanying drawing, there is shown for the purpose of illustration, one embodiment which my invention may assume in practice.

In this drawing:

Figure 1 is a vertical section of the improved sampling apparatus of my invention; and

Figure 2 is a section taken on line II—II of Figure 1.

Referring more particularly to the drawing, the improved sampling device of my invention is shown incorporated with a vertically arranged spout or conduit member 2 through which the cement or other pulverized material passes from one point to another.

According to the present invention, there is arranged within a housing 3 positioned to one side of the spout or conduit 2, a horizontally arranged shaft 4 which is arranged in suitable bearings 5 carried by the housing 3. There is securely arranged on the shaft 4 centrally thereof, a disk-like member 6 having a plurality of spaced apart pockets 7 arranged around the periphery thereof for receiving sample portions of the material as will hereinafter be described. The disk-like member 6 is arranged so that a portion thereof extends through a slotted opening 8 and is disposed within the vertically arranged spout or conduit 2. The space between the edge of the opening 8 and the side walls of the disk-like member 6 is sealed preferably by means of a felt member 9 suitably arranged around the opening at both the sides, the top and the bottom of the disk 6 so as to seal the opening 8 against leakage.

There is securely arranged on one end of the shaft 4, a circular member 10 having cam portions 12 arranged preferably on the outer face thereof adjacent the periphery of the same. There is mounted on the outer side of the housing 3 adjacent the outer edge of the circular member 10, a rapping member in the form of a pin 13 which is suitably mounted in a supporting member or housing 14 which houses a pair of coil springs 15^a and 15^b disposed around the pin with a flange 15 carried by the pin positioned therebetween and with the spring 15^b positioned below the flange adapted to retain the pin in a retracted position. That is, the rapping pin 13 is suspended by the lower spring so that the pin is normally slightly clear of the side of the sampling wheel or member 6. On the outer end of the pin 13 there is positioned preferably a pin or stud shaft 16 which carries a roller 17 which is adapted to cooperate with the cam portions 12 carried by the circular member 10 in a manner hereinafter to be described.

The shaft 4 may be driven in any suitable manner, but in the present instance there is shown a sprocket 18 securely arranged on the opposite end of the shaft 4 from the circular member 10 which may be driven by a gear reducer and motor (not shown).

It will be understood that the sampling device of my invention operates in the following manner:

The disk-like member 6, together with shaft 4 to which it is attached, is revolved in the direction shown by the arrow in Figure 1, at a relatively slow speed in the stream of material as the same passes through the spout or conduit member 2. During such travel, the upper pockets 7 disposed in the spout 2 will be filled with the material as the disk-like member rotates. As the pockets 7 pass through the slotted opening 8 and down through the housing 3, the circular member 10 will actuate the pin 13 through the cooperation of the cam members 12 and the roller 17 thereby loading the coil spring 15^a. The pin will strike a sharp blow against the side of the disk-like member 6 after the cam 12 is out of contact with the roller 17. The material is thereby loosened from the pockets and will drop freely therefrom and be delivered into the

funnel-shaped portion 19 arranged at the bottom of the housing 3 to which there is preferably connected a removable sample box 20. It will be understood that when the pin 13 is released to deliver a tap or rapping action on the disk 6, it will travel beyond the neutral point or its retracted position against the action of the lower spring 15b, thereby loading the same and the spring 15b will then return the pin to its retracted or neutral position away from the disk.

It will be seen that my improved sampling device is shown incorporated with a gravity spout or conduit, but it will be understood that if desired, it can be incorporated in the systems where the cement or pulverized fuel is transported by means of pneumatic pressure. In such a case, the housing 3 would be air tight and the sample container or box 20 would be attached to the funnel-shaped portion 19 of the housing 3 with an air-tight joint. In such a case, the pressure in the transport pipe or conduit 2 and the housing 3 would be equalized and there would be no tendency for the cement or pulverized material to be forced through the opening 8 and the seal 9 around the disk-like member 6.

While I have shown and described an embodiment of my invention, it will be understood that I do not wish to be limited exactly thereto, since various modifications may be made without departing from the scope of the invention, as defined in the appended claims.

I claim:

1. Apparatus of the class described including, in combination, a substantially horizontal shaft, a rotatable disk-like member securely arranged on said shaft which is adapted to rotate with a segment thereof in contact with the stream of material to be sampled, said disk-like member having a plurality of spaced apart pockets arranged around the periphery thereof for receiving sample portions of the material as the same is rotated in contact therewith, a rapping member which is adapted to tap the disk-like member so as to cause the sample portions to drop therefrom due to gravity, means for receiving and collecting the sample portions as the same are delivered from the pockets in said disk-like member, a rotatable cam member securely arranged on said shaft which is adapted to intermittently actuate said rapping member, and means for rotating said shaft together with said disk-like member and said cam member.

2. Apparatus of the class described including, in combination, a conduit through which the material to be sampled flows to a point of delivery, a disk-like member rotatably arranged on substantially a horizontal axis to one side of said conduit with a portion of said disk-like member extending into said conduit, said disk-like member having a plurality of spaced apart pockets arranged around the periphery thereof for receiving sample portions of the material as the same is rotated, means for rotating said disk-like member, a rapping member which is adapted to tap the disk-like member so as to cause the sample portions to drop therefrom due to gravity, means for receiving and collecting the sample portions as the same are delivered from the pockets of said disk-like member, and means for actuating intermittently said rapping member.

3. Apparatus of the class described including, in combination, a vertically arranged conduit through which the material to be sampled flows to a point of delivery, a substantially horizontal shaft rotatably arranged to one side of said conduit, a disk-like member having a portion thereof extending into said conduit securely arranged on said shaft, said disk-like member having a plurality of spaced apart pockets arranged around the periphery thereof for receiving sample portions of the material as the same is rotated in the conduit and the material comes in contact therewith, a rapping member which is adapted to tap the disk-like member so as to cause the sample portions to drop therefrom due to gravity, means arranged below said disk-like member for receiving and collecting the sample portions as the same are delivered therefrom, a rotatable cam member securely arranged on said shaft which is adapted to intermittently actuate said rapping member, and means for rotating said shaft together with said disk-like member and said cam member.

4. Apparatus of the class described including, in combination, a conduit through which the material to be sampled passes to a point of delivery, said conduit having an elongated opening arranged in the side thereof, a disk-like rotatable member having a portion thereof extending through said opening into said conduit, said disk-like member having a plurality of spaced apart pockets arranged around the periphery thereof for receiving sample portions of the material as the rotatable member rotates in the opening in said conduit, means arranged around said opening and the rotatable member for sealing the space between the sides of the opening and the rotatable member disposed therein against leakage, said rotatable members upon rotation thereof adapted to pick up portions of the material from said conduit for sampling by means of the pockets carried by said rotatable member and to carry said portions to a point outside of said conduit, and means arranged on the outer side of said conduit for receiving the sample portions of the material as they are delivered from said pockets.

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