

May 1, 1928.

1,668,324

H. KREISINGER

FUEL SUPPLYING DEVICE

Filed Dec. 17, 1926

2 Sheets-Sheet 1

Fig:1.

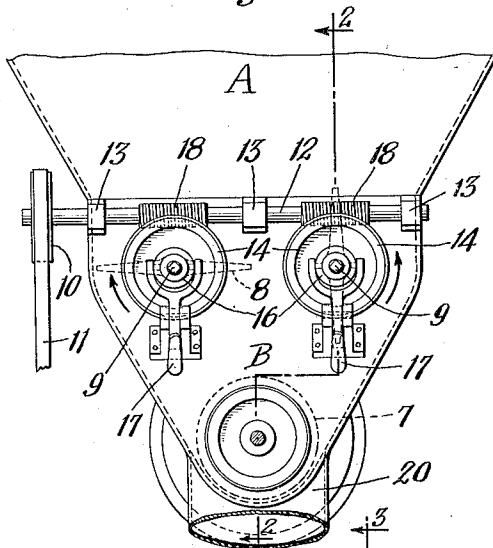


Fig:3.

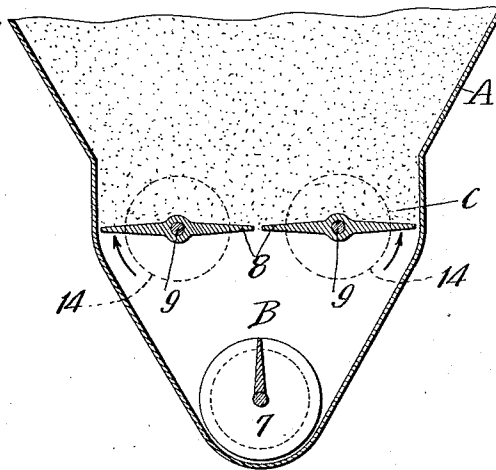
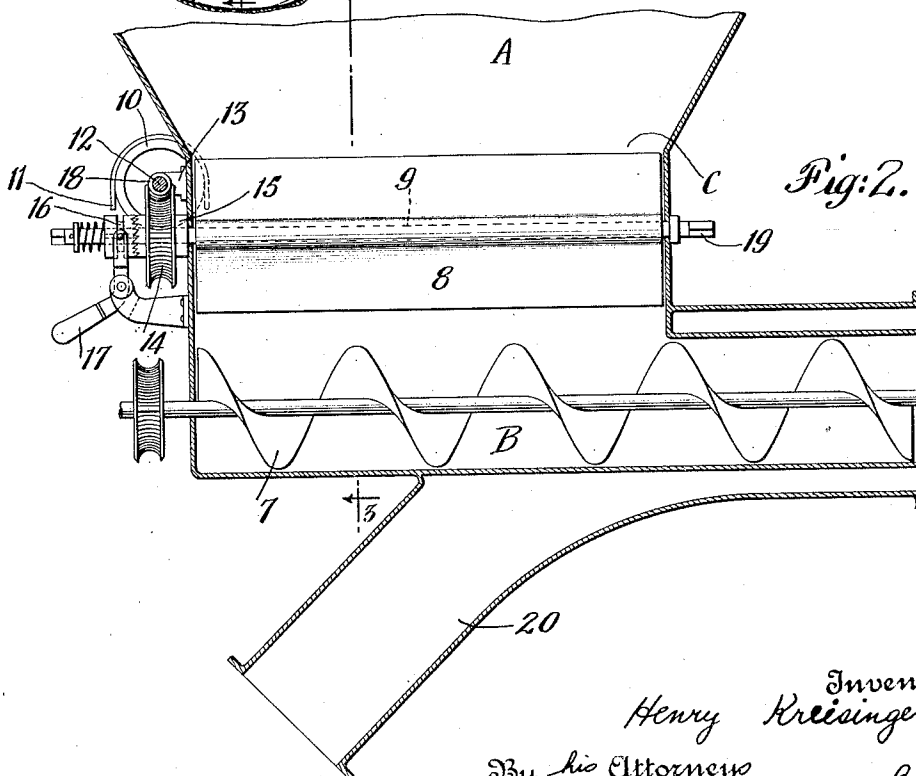


Fig: 2.



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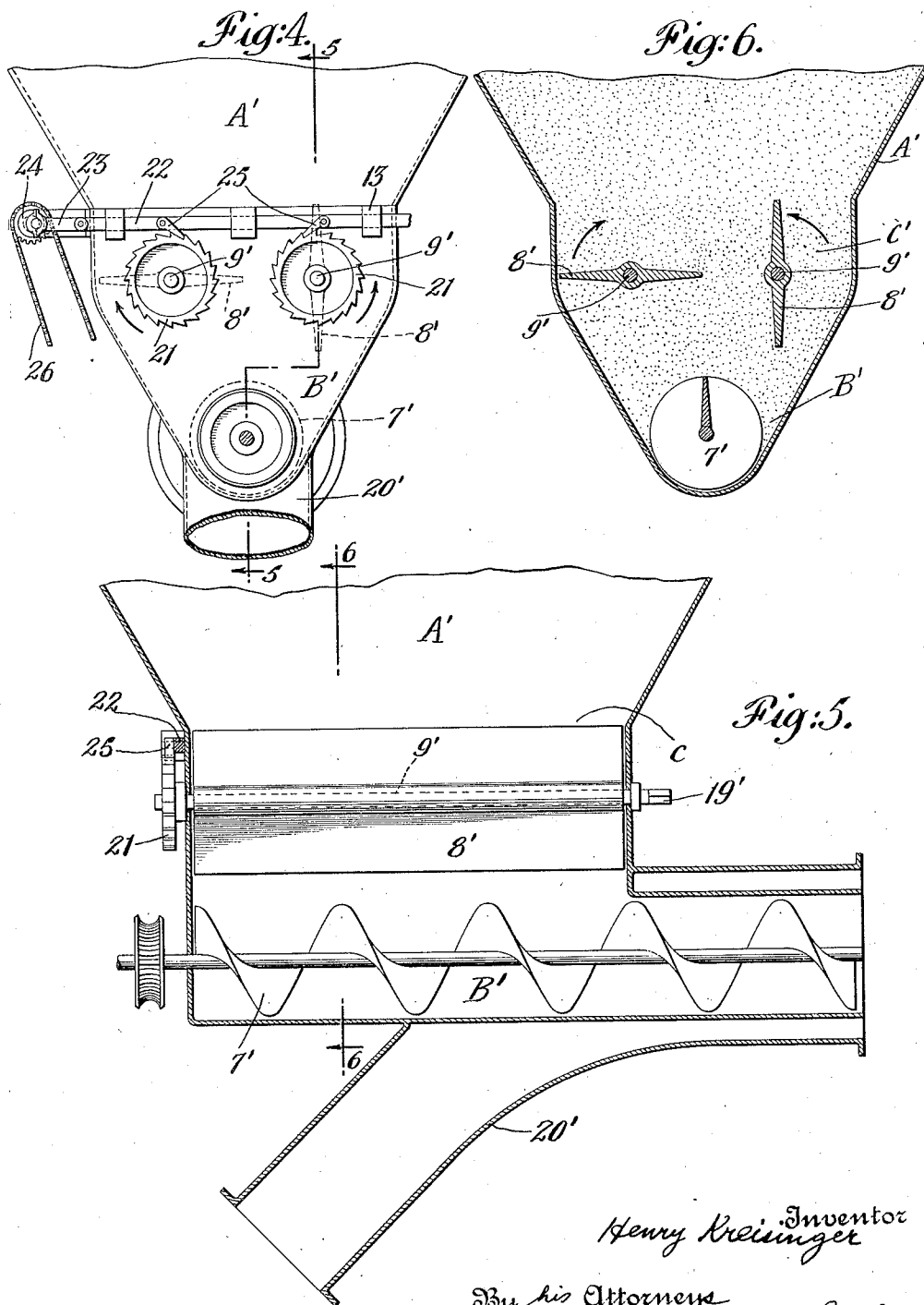
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

HENRY KREISINGER, OF PIERMONT, NEW YORK, ASSIGNOR TO INTERNATIONAL COMBUSTION ENGINEERING CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

FUEL-SUPPLYING DEVICE.

Application filed December 17, 1926. Serial No. 155,436.

This invention relates to a mechanism for supplying finely divided material, such, for example, as pulverized coal, and is particularly useful in connection with the delivery of such material from bins or other such receptacles in which it may be stored. The invention will be described as used in connection with pulverized coal.

The present invention is an improvement of the apparatus shown and described in United States Letters Patent No. 1,555,297, granted September 29, 1925.

As pointed out in this patent, there have been certain difficulties encountered in maintaining a regular flow of coal, owing to the irregularity in feeding and flooding of the screw feeders which are used to convey the coal from the bins. This is due to the coal sticking on the walls of the feeder hoppers and on the walls of the bins which causes the coal in the bin to bridge over above the screw feeders forming what are called "rat holes". When such holes are formed, the screw feeders may stop feeding altogether, and when the coal caves into the "rat hole", it frequently causes flooding of the feeder.

There has also been some difficulty, as pointed in the above patent, in connection with the shutting off of the coal in the bin when it is desired to cut out a feeder.

It is the primary object of the present invention to provide an improved agitator for the coal to prevent sticking and the consequent formation of "rat holes".

It is a further object of my invention to provide an improved agitator which may also be used as a shut-off.

It is a further object of my invention to provide an agitator which will operate effectively without packing the coal at any point.

The foregoing, together with such other objects as may hereinafter appear, or are incident to my invention, I obtain by means of a construction which I have illustrated in preferred form in the accompanying drawings, wherein—

Fig. 1 is an end elevation of a portion of a coal bin with my improved shut-off and agitator applied thereto.

Fig. 2 is a section taken on the line 2—2 of Fig. 1, with certain of the parts shown in elevation.

Fig. 3 is a section taken on the line 3—3 of Fig. 2, with both shutter blades in horizontal position.

Fig. 4 is a view similar to Fig. 1 showing certain modifications of the driving mechanism.

Fig. 5 is a section on the line 5—5 of Fig. 4, and

Fig. 6 is a section on the line 6—6 of Fig. 5.

Referring, now, to Figs. 1 to 3, reference letter A indicates a pulverized coal bin having an outlet portion C and a trough portion B in which the screw feeder 7 operates.

The combined shut-off and agitator blades 8 are placed in the outlet C and are fixed to shafts 9 which are mounted to revolve in the sides of the bin. These blades 8, when used as agitators, lie at right angles to each other, as shown in Fig. 1, and are slowly revolved in opposite directions. The means for actuating the blades 8 comprise a motor (not shown) of any suitable type which drives the pulley 10 by means of belt 11. The pulley 10 is secured to the shaft 12 which revolves in bearings 13 secured to the side of the bin A. The shafts 9 project through the side of the bin A and oppositely threaded worm wheels 14 having the hubs 15 are revolvably mounted on the shafts. The worm wheels 14 are operatively connected to the shafts 9 by means of clutch mechanisms 16 operated by clutch levers 17. The shaft 12 carries the oppositely threaded worms 18 which engage the worm wheels 14, causing them to revolve in opposite directions.

I have found that the best results are obtained if the shutter blades 8 revolve at about one revolution every four to ten minutes, which is sufficient to keep the coal stirred up and also requires very little power. These blades are so located and operated in the outlet C that they pass upwardly along the sides of the bin (as indicated by the arrows in Fig. 1) and downwardly in the center in order to prevent packing at the sides of the bin which might occur if they were revolved in the opposite directions.

When it is desired to shut off the flow of coal from the bin, the clutches 16 are disengaged from the worm wheels 14, and the

shafts 9 are turned independently by a wrench applied to the squared ends 19 thereof, projecting beyond the bin at the side opposite the worm wheels. The shafts will be turned until the shutter blades 8 both lie in a horizontal plane in the outlet C, as indicated in Fig. 3, and, although there is a slight clearance between blades and between the blades and the sides of the bin, I have found that it is not sufficient to allow any leakage of coal.

The screw feeder 7 may be driven in any well known manner, and air is supplied to the coal at the end of the feeder by the air line 20 which surrounds the feeder at the end thereof.

In Figs. 4 to 6, inclusive, I have illustrated another form of actuating mechanism for the shutter blades 8 which comprises, instead of worm wheels, the oppositely set ratchet wheels 21 fixed to shafts 9. The reciprocating shaft 22 is operated, through the medium of the connecting rod 23, by means of the crank 24 which is connected by chain 26 with the feeder mechanism through any suitable speed reducing mechanism (not shown). Pawls 25 are secured to the reciprocating shaft 22 and engage the ratchet wheels 21, causing them to revolve slowly in opposite directions upon movement of the shaft 22.

When it is desired to move the shutter blades 8 independently, the pawls are lifted, and the shafts 9' turned by means of a wrench until the blades assume a horizontal position in the outlet C', as explained in connection with Figs. 1 to 3.

It will be seen that in both forms of the device the shutter blades are kept in substantially fixed angular relation to each other when revolving, so that at no position will they both lie in a horizontal plane and thus shut off the supply of fuel when used as agitators. There will be a slight variation in the angular relation of the blades shown in Figs. 4 to 6, owing to the fact that when one blade is moving, the other is stationary, but, for all practical purposes, they may be said to revolve in fixed relation.

It will be seen that I have provided a construction which requires but little power to operate, and in which there will be little wear on the mechanism. Danger of packing of the coal and consequent strain on the mechanism has also been eliminated.

I claim:—

1. Apparatus for supplying finely divided material including a source of supply having a discharge outlet and an agitator in said outlet including a plurality of revolubly mounted shutter blades.

2. Apparatus for supplying finely divided material including a source of supply having a discharge outlet, an agitator in said

outlet including a plurality of revolubly mounted shutter blades, and means whereby said blades may be operated to form a closure for said outlet.

3. Apparatus for supplying finely divided material including a source of supply having a discharge outlet, an agitator in said outlet including a plurality of shutter blades, and means whereby said blades may be revolved in substantially fixed relative positions.

4. Apparatus for supplying finely divided material including a source of supply having a discharge outlet, an agitator in said outlet including a plurality of shutter blades, and means whereby said blades may be revolved in substantially fixed angular relation.

5. Apparatus for supplying finely divided material including a source of supply having a discharge outlet, an agitator in said outlet including a plurality of revolubly mounted shutter blades, an actuating shaft, and means whereby said shaft may be releasably connected to said shutter blades.

6. Apparatus for supplying finely divided material including a source of supply having a discharge outlet, an agitator in said outlet including a plurality of shutter blades, and means whereby said blades may be revolved in opposite directions.

7. Apparatus for supplying finely divided material including a bin having a discharge outlet, an agitator in said outlet including a plurality of shutter blades, and means whereby said blades may be revolved so they pass upwardly along the sides of the bin.

8. Apparatus for supplying finely divided material including a source of supply having a discharge outlet, an agitator in said outlet including a plurality of revolubly mounted shutter blades, an actuating shaft, means whereby said shaft may be releasably connected to said shutter blades, and means whereby said blades may be independently operated when released from the shaft.

9. Apparatus for supplying finely divided material including a bin having a discharge outlet, an agitator in said outlet including a plurality of shutter blades, revoluble shafts upon which said blades are mounted, an actuating member, and means whereby said shafts may be releasably connected to said actuating member.

10. Apparatus for supplying finely divided material including a bin having a discharge outlet, an agitator in said outlet including a plurality of shutter blades, revoluble shafts upon which said blades are mounted, a worm wheel revolubly mounted on each shaft, said worm wheels being oppositely threaded, oppositely threaded worms engaging each worm wheel, a clutch member between each shaft and worm wheel, and

means whereby said worms may be revolved.

11. Apparatus for supplying finely divided material including a bin having a discharge outlet, an agitator in said outlet including a plurality of shutter blades, revolving shafts upon which said blades are mounted, a worm wheel revolubly mounted on each shaft, worms engaging each worm wheel, a clutch member between each shaft and worm wheel, and means whereby said worms may be revolved. 10

In testimony whereof I have hereunto signed my name.

HENRY KREISINGER.