R. S. RILEY.

AGITATING COAL FEEDING HOPPER.

APPLICATION FILED APR. 29, 1920.

1,360,798. Patented Nov. 30, 1920.

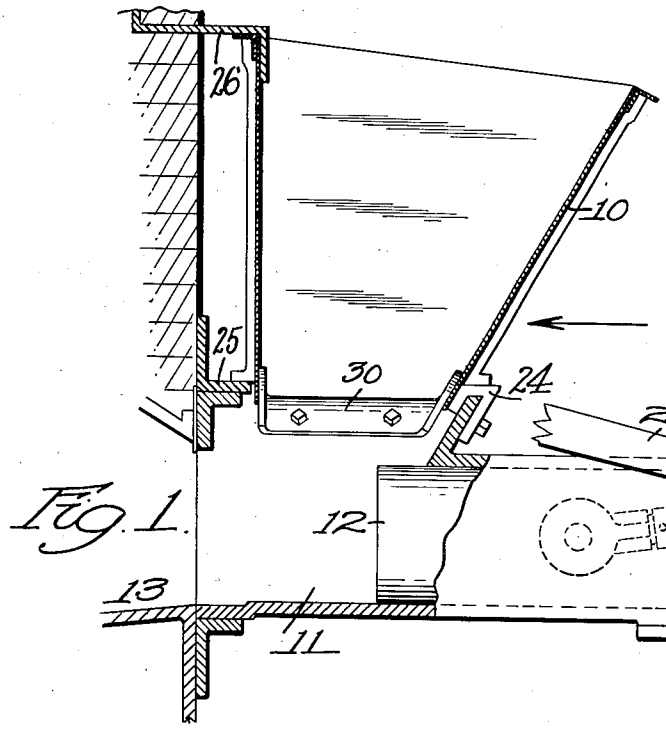


Fig. 1.

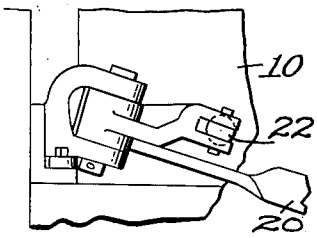


Fig. 3.

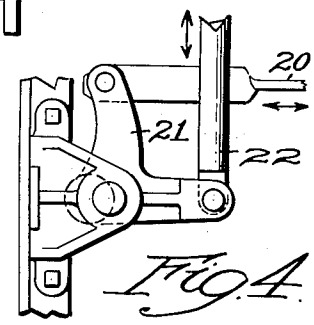


Fig. 4.

Fig. 2.

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AGITATING COAL-FEEDING HOPPER.

1,360,798. Specification of Letters Patent. Patented Nov. 30, 1920.

Application filed April 29, 1920. Serial No. 377,640.

To all whom it may concern:

Be it known that I, ROBERT SANFORD RILEY, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Agitating Coal-Feeding Hopper, of which the following is a specification.

This invention relates to a hopper capable of general use but especially designed for feeding coal to a stoker or the like.

The principal object of this invention is to provide for properly agitating the coal or other granular material so as to prevent the formation of arches that will stop the feed downwardly in the hopper which usually is of smaller cross section at the bottom than at the top; also to provide a kind of agitation which will act as efficiently at the top of the hopper as at the bottom, and therefore will materially aid in an additional way in preventing the formation of arches.

Reference is to be had to the accompanying drawings in which—

Figure 1 is a transverse sectional view of a hopper constructed in accordance with this invention showing other parts with which it is connected;

Fig. 2 is a side view with parts in section;

Fig. 3 is an outside end view of a portion of the hopper, and

Fig. 4 is a plan of the elements shown in Fig. 3.

As far as I am aware the agitation of fuel and other granular material for the purpose of insuring uniform feed has been done on a commercial scale by introducing arms and blades into the hopper and moving them in such a way as to cut into the arches, usually after they are formed.

This invention is designed more to keep the arches from forming, and thus to eliminate the necessity of introducing additional elements and complications into the interior of the hopper itself. For this purpose I perform the agitation by moving the hopper as a whole. This preferably is done constantly so as to keep up a slight shifting motion of the entire body of fuel and thus keep it moving uniformly down into the discharge troughs below.

The invention is capable of general use, but I have shown it in connection with a hopper 10 of well known type adapted to feed coal by gravity down into a series of transverse throats 11. At the bottom of these throats are plungers 12 for positively forcing the coal into the stoker 13. These plungers are shown as operated from a shaft 14 by connecting rods 15 as is well understood in this art.

For the purpose of operating the hopper and causing the desired agitation I have shown the end of the shaft 14 as provided with a disk 17 having a raised projection 18 thereon supporting a crank pin 19. This pin is connected with a link 20 which reciprocates transversely as the shaft rotates. This link transmits motion by a bell crank 21 to an operating rod 22 which is connected with the end of the hopper 10 by a pivot pin 23, or in any other desired manner. Thus the hopper itself is shifted longitudinally.

This hopper is located above the stationary troughs 11 and supported by them, and several stationary guides 24, 25 and 26 are shown for receiving flanges on the hopper and permitting of the reciprocating motion of the hopper.

It will be seen that in practice the reciprocation of the four walls of the hopper shifts the entire body of coal slightly and sharply over fixed ridges located between the throats 11 and in a direction transverse to them. This motion of the coal is positive at the two ends of the hopper and it is almost as positive throughout the whole length of it. The coal shifting back and forth constantly, the formation of an arch from one of these ridges to another is prevented by breaking it up as it forms. In other words, the coal is kept loose and agitated throughout the body thereof. The ridges are supplied with transverse cross bars 30 closing their tops and fixed in stationary position. The coal moves over the cross bars transversely to them and longitudinally of the hopper. Thus the arches which tend to form transversely across at the bottom of the hopper and also arches tending to form longitudinally from one ridge to the next are broken up in their incipiency by the fact that the hopper walls have this constant reciprocating motion and the lumps lodged against them are necessarily jarred so as to keep the body of fuel loose and free to slide down into the troughs below. Any tendency of the coal to pack together in spite of the motion of the hopper is neutralized by the sta-

tionary cross bars 30 with which it comes into contact during its motion.

Although I have shown the invention as applied to a single type of stoker feeding hopper and shown only a single form of the invention I am aware of the fact that it can be applied to other types of hoppers and that modifications can be made for that purpose or even when applying it to this type of hopper without departing from the scope of the invention as expressed in the claims. Therefore I do not wish to be limited in these respects, but what I claim is:—

1. In a device for feeding coarse or granular material, the combination with a hopper and stationary means for receiving the material down through the bottom thereof, of means for creating a movement of the entire body of material in the hopper above said receiving means in a direction transverse to the direction of feed to prevent the formation of arches therein.

2. The combination with a fuel feeding hopper, and fixed means for receiving the fuel down through its bottom, of means for reciprocating the hopper longitudinally to keep the fuel loose therein and insure uniformity of feed.

3. The combination with a hopper for holding fuel and feeding it downwardly and means below for receiving the fuel therefrom, of means for reciprocating the hopper as a whole longitudinally independently of said receiving device.

4. The combination with throats having stationary ridges between them, of a hopper above them for feeding material to them, said hopper being movable transversely to the ridges.

5. The combination with a fuel feeding hopper and a series of transverse ridges located across the bottom of the hopper below it, of means for causing motion of the hopper over said ridges for the purpose of preventing the formation of arches.

6. The combination with a fuel feeding hopper and a series of transverse throats at the bottom thereof for receiving the fuel therefrom, said throats having transverse ridges between them located across the bottom of the hopper below it, of means for causing a simultaneous motion, transversely to the length of the ridges, of the entire body of fuel in the hopper over said ridges for the purpose of preventing the formation of arches with their ends resting on said ridges.

7. The combination with a fuel feeding hopper and a series of transverse throats at the bottom thereof for receiving the fuel therefrom, said throats having transverse stationary ridges between them located across the bottom of the hopper, of means for causing a longitudinal motion of the entire body of fuel in the hopper for the purpose of preventing the formation of arches with their ends resting on said ridges, and stationary cross bars under said hopper and over the ridges.

In testimony whereof I have hereunto affixed my signature.

ROBERT SANFORD RILEY.