

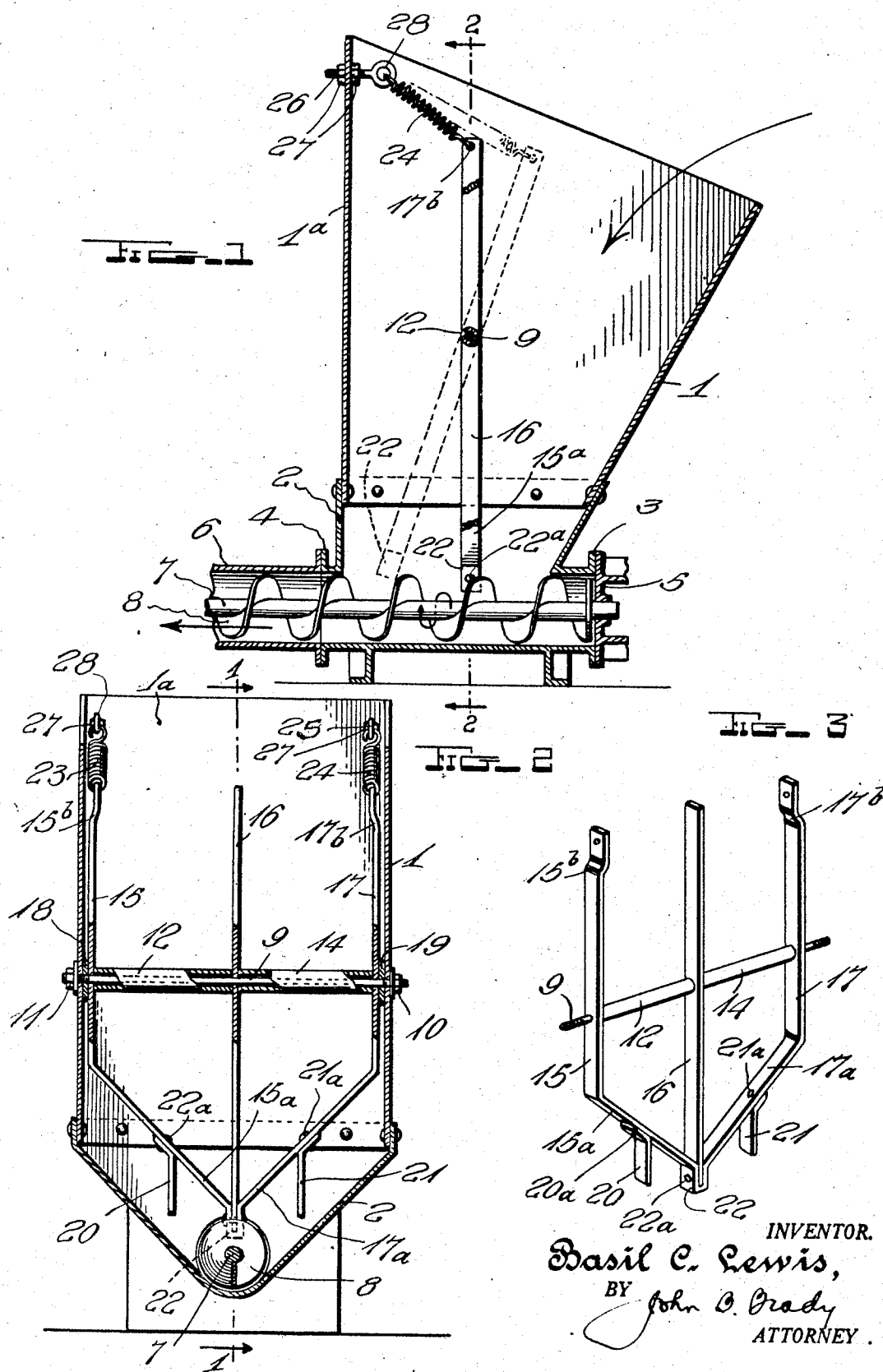
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AGITATOR FOR COAL HOPPERS

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AGITATOR FOR COAL HOPPERS

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My invention relates broadly to automatic stokers and more particularly to an agitator for coal hoppers used in automatic stokers.

One of the objects of my invention is to provide a simplified construction of agitator for coal hoppers in automatic stokers.

Another object of my invention is to provide a construction of agitator for coal hoppers wherein resilient means are provided for subjecting the agitator to an adjustable tension to insure the periodical movement of the agitator.

A further object of my invention is to provide a construction of agitator for the coal hopper of an automatic stoker in which a multiplicity of resilient devices are arranged for subjecting the agitator to different degrees of spring tension while balancing the agitator for movement within the hopper under control of the screw conveyor therein.

A still further object of my invention is to provide a construction of frame pivotally mounted within a coal hopper and operating as a rockable agitator for the coal within the hopper, a multiplicity of variable tensioned devices being connected to opposite parts of the agitator for subjecting the agitator to varying degrees of tension against the action of the screw conveyor within the coal hopper.

Other and further objects of my invention reside in the simplified construction of agitator for coal hoppers as set forth more fully in the specification hereinafter following by reference to the accompanying drawings, in which:

Figure 1 is a cross-sectional view taken through the hopper, agitator and screw conveyor of an automatic stoker on line 1—1 of Fig. 2; Fig. 2 is a cross-sectional view through the hopper and conveyor therein on line 2—2 of Fig. 1; and Fig. 3 is a perspective view of the agitator which is employed in the coal hopper of my invention.

In agitators heretofore employed in coal hoppers difficulty has been experienced by the breakage of the agitator arms in the course of their movement through the coal

within the hopper. I have devised a construction of agitator which is in the nature of a rigid frame having a multiplicity of arms thereon and which is not subject to breakage under conditions of movement against relatively great pressure of the coal within the hopper. In order to insure the return of the agitator to its initial position, I provide independent spring devices connecting different parts of the agitator frame by which an adjustable tension is applied to the agitator frame. The agitator frame has opposite arms thereof connected at their extremities to adjustable spring members, the tension on which may be changed in accordance with the wear of the agitator and natural deterioration of the resilient parts.

Referring to the drawings in more detail, reference character 1 designates the coal hopper which connects to the trough 2 having end flanges 3 and 4. The end flange 3 abuts against the end plate 5 in which the shaft 7 of the screw conveyor 8 is journaled. The end 4 of trough 2 connects with the conveyor housing 6. A rod member 9 extends laterally across the hopper 1 and is secured by nuts 10 and 11 at opposite ends thereof in the side walls of the hopper 1. There is provided on the rod member 9 the spacer washers 18 and 19 immediately adjacent the interior walls of the hopper 1 and the tubular spacers 12 and 14 which serve to space the frame members 15, 16 and 17 of the agitator one to another. The agitator comprises a pair of frame members substantially conforming in contour with the inner cross-section of the coal hopper. It will be observed that the trough 2 has converging side walls leading down to the base thereof through which screw 8 operates. The frame members 15 and 17 are each shaped to conform with the contour of the side walls of the hopper and with the contour of the converging walls of the trough 2. The frame member 15 is bent at an angle as represented at 15^a. Frame member 17 is bent at an opposite angle as represented at 17^a. The frame members 15 and 17 are continuous and are bent around an apex portion 22 as shown. The agitator member 16 extends into the apex portion 22 and is riveted therein as

indicated at 22^a forming a depending extremity which is engaged by the screw 8 of the endless conveyor for the angular movement thereof according to the pitch of the screw conveyor 8 as represented in dotted lines in Fig. 1. The angularly disposed portions of the agitator members 15^a and 17^a of frame members 15 and 17 each carry the depending members 20 and 21, respectively, these members being riveted thereon as indicated at 20^a and 21^a. The frame members 15 and 17 are bent inwardly at their upper extremities as represented at 15^b and 17^b and are each apertured to receive the ends of coil springs 23 and 24, respectively. The other ends of the coil springs 23 and 24 extend through eye bolts 25 and 28 secured through the rear wall 1^a of the hopper 1. The eye bolts 25 and 28 have screw threaded shanks 26 thereon with lock nuts 27 screwed upon the shank 26 for engaging opposite sides of the wall 1^a. When it is desired to change the tension under which the agitator frame operates, the position of the screw threaded shank 26 of the eye bolts 25 and 28 is varied with respect to lock nuts 27 in the wall 1^a. To increase the tension, the eye bolts are screwed to a position closely adjacent the wall 1^a, thereby placing the coil springs 23 and 24 under the desired tension when the end 22 of the agitator abuts against one of the convolutions of the feed screw conveyor 8 as illustrated in Fig. 1. If it is desired to decrease the tension, the eye bolts are screwed and locked in a position further away from the end wall 1^a. The arrangement of the agitator is such that the desired condition of balance may be obtained by the independent adjustment of eye bolts 25 or 28. The washer members 18 and 19 serve to space the frame members 15 and 17 from the interior walls of the hopper 1 so that these frame members are free to move to their limited paths of angular movement without frictional engagement with the interior walls of the hopper 1. The tubular spacers 12 and 14 maintain the frame members 15, 16 and 17 in predetermined spacial relation regardless of the obstruction offered by the deposit of coal in the hopper. The rocking movement which is imparted to the agitator frame structure is determined by the pitch of the convolutions of the screw conveyor 8. The lower extremity 22 of the frame structure is maintained in spring pressed engagement with the screw conveyor and is shifted longitudinally through a distance determined by the pitch of the screw 8 to the dotted line position illustrated in Fig. 1, at which time the agitator frame is free of the screw conveyor and may be returned to the full line position preparatory to a repeat operation.

I have found the agitator of my invention to be highly practical in its construction and successful in operation, and while I have described my invention in a certain preferred

embodiment, I desire that it be understood that modifications may be made and that no limitations upon my invention are intended other than are imposed by the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is as follows:

1. An agitator for coal hoppers of the screw conveyor type comprising a rigid frame structure including a plurality of frame members shaped to substantially conform with the interior contour of the coal hopper, means for pivotally mounting said frame members for rockable movement within the coal hopper, the frame members terminating in a depending end adapted to engage with the convolutions of the screw conveyor, and a plurality of spring means for adjustably tensioning said frame structure for movement within the coal hopper under control of the screw conveyor.

2. An agitator for coal hoppers cooperating with a screw conveyor comprising a rigid frame structure, means for pivotally mounting said rigid frame structure within the coal hopper, said frame structure having a depending extremity adapted to engage the convolutions of the screw conveyor, said frame structure including a pair of side frame members and a central frame member, means for positively spacing said frame members one from another, and means for maintaining said frame members under predetermined tension for actuation by the movement of said screw conveyor.

3. An agitator for coal hoppers of the screw conveyor type comprising in combination with a hopper a rigid frame structure, means for pivotally mounting said frame structure within the coal hopper with the depending end thereof in engagement with the convolutions of the screw conveyor and adapted to ride along the screw conveyor to effect periodic angular displacement of the frame structure as a whole, and resilient means connected between one wall of said hopper and the upper extremity of said frame structure for selectively varying the tension to which said frame structure is subjected.

4. An agitator for coal hoppers of the screw conveyor type comprising in combination with a coal hopper a rigid frame structure, means extending laterally across the coal hopper for pivotally mounting said frame structure therein with the depending end of said frame structure engaging the convolutions of said screw conveyor and adjustable spring tension means connected between the rear wall of said hopper and the upper extremity of said rigid frame structure, and effective to oppose the displacement of said frame structure under control of said screw conveyor.

5. An agitator for coal hoppers of the screw conveyor type comprising in combination with a hopper a rigid frame structure including a plurality of longitudinally extending members, means for extending through the sides of said hopper for rotatably mounting said frame structure, one of said members extending substantially coincident with the axis of said hopper and in a plane passing through the axis of said screw conveyor, the others of said longitudinally extending members having the lower portions thereof angularly disposed and forming a juncture with the end of said first mentioned longitudinally extending member, agitator members carried by each of the angularly disposed portions of said last mentioned longitudinally extending members, and spring means connected to the extremities of said last mentioned longitudinally extending members for selectively tensioning said frame structure against displacement under operation of said screw conveyor.

6. An agitator for coal hoppers of the screw conveyor type comprising a frame structure having a plurality of vertically extending rigid bar members therein, said bar members comprising a central member and a pair of side members, said side members being shaped to substantially conform with the contour of said coal hopper, means extending laterally through said hopper for rotatably mounting said bar members, a juncture for said bar members at the lower extremities thereof, said juncture engaging the convolutions of said screw conveyor whereby rocking movement may be imparted to said frame structure according to the rotation of said screw conveyor, and spring means connected with the upper extremities of said side members for selectively tensioning said frame structure against the action of said screw conveyor.

In testimony whereof I affix my signature.
BASIL C. LEWIS.