June 1, 1926. 1,587,174

J. H. NASH

COAL BIN

Filed April 5, 1923 3 Sheets-Sheet 1

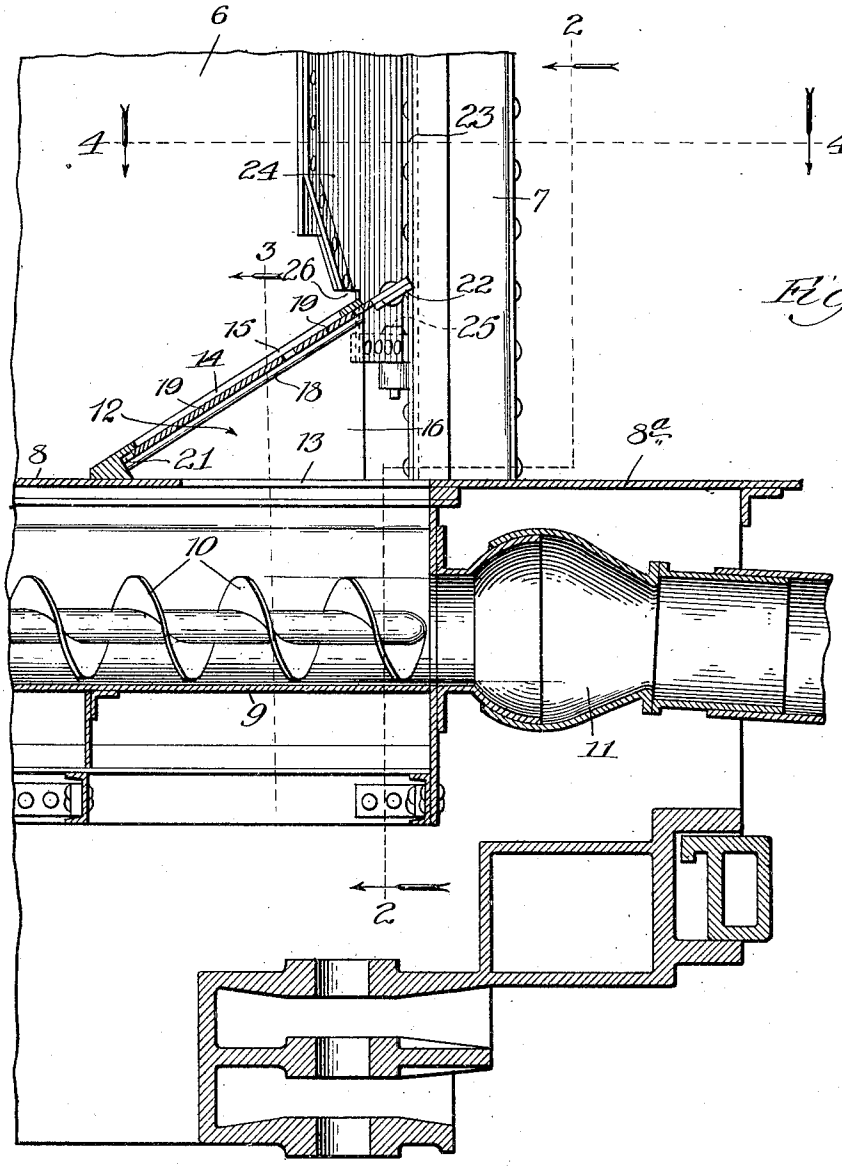


Fig. 1.

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Fig. 2.

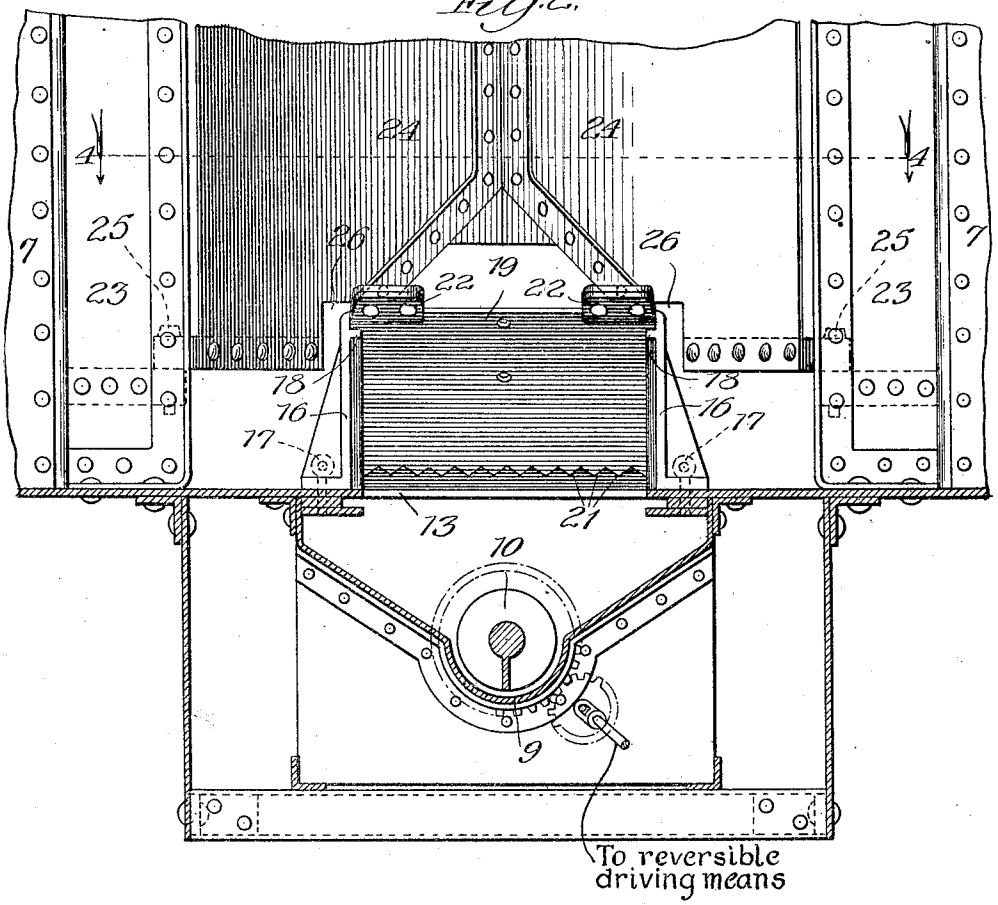
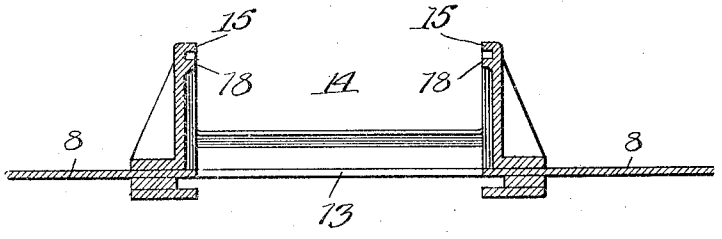


Fig. 3.



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Fig. 4.

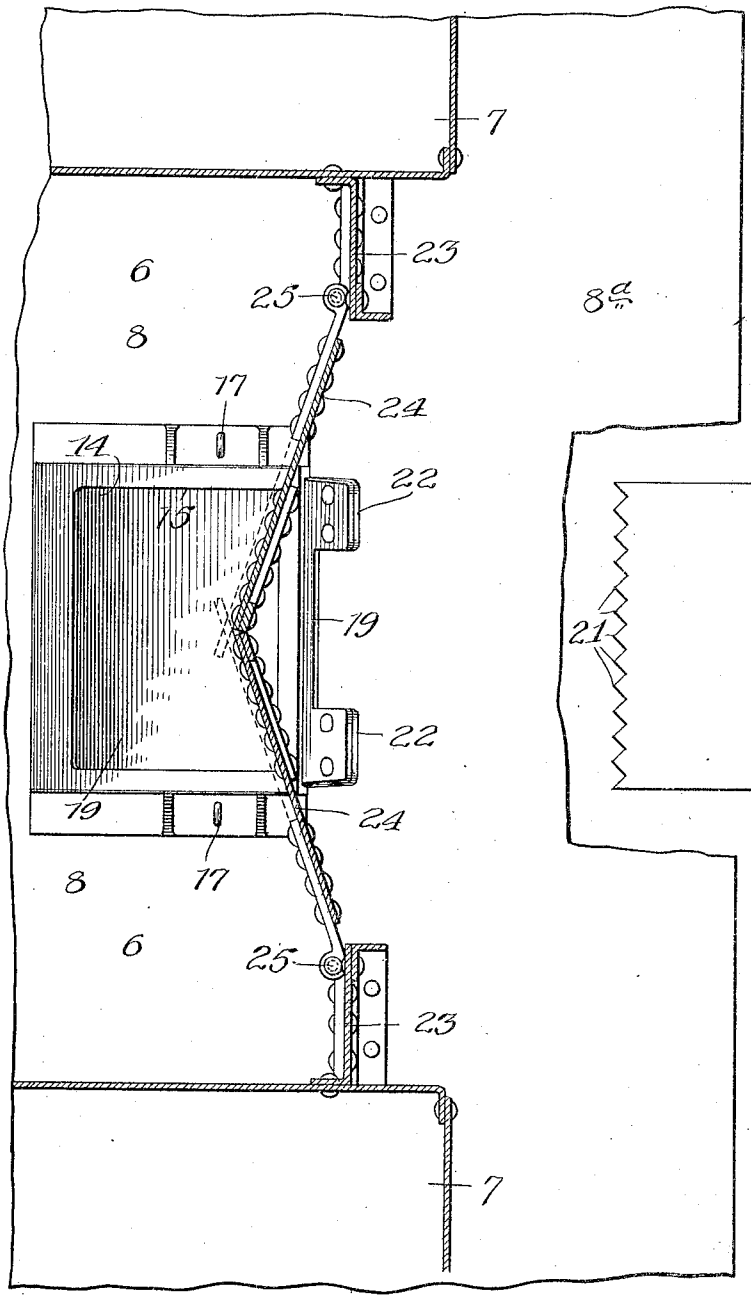
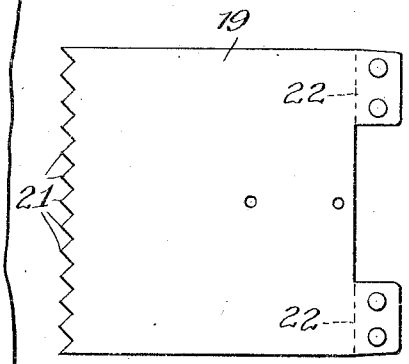


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOSEPH H. NASH, OF CHICAGO, ILLINOIS.

COAL BIN.

Application filed April 5, 1923. Serial No. 630,095.

My invention relates more particularly to coal bins for cooperation with stoker mechanism involving conveyor means which latter is so positioned relative to the coal in the bin that the coal feeds thereto by gravity, my invention having been devised for embodiment, more particularly, in coal tenders of locomotives equipped with stoking mechanism.

It is common practice in structures of the character above referred to, to provide the bottom of the bin with openings toward the front and rear thereof, which communicate with the housing in which the conveyor portion of the stoking mechanism, and which is commonly an Archimedean screw, operates, and to provide these openings with slides for controlling the flow of coal to the housing. It often happens, however, that coal or foreign bodies entering the housing, become wedged between the screw and the housing and interrupt the operation of the conveying mechanism. When this occurs, in the case of structures as hitherto provided, it is impossible to gain access to the housing through the opening in the bottom of the bin at the forward end of the bin, when the bin is fairly filled with coal, without removing a sufficient quantity of the coal to expose this forward opening, this condition presenting a serious obstacle in the satisfactory performance of structures of this character.

One of my objects is to provide improvements in bin structures of the general character above stated whereby objects which may become wedged between the housing and the movable conveyor element therein, may be removed and thus restore the apparatus to normal functioning without removing all, or at least the greater part, of the coal from the bin. Another object is to provide a construction whereby the conveying element may be reversely operated in the housing, without removing the coal from the bin, for dislodging wedged material. Another object is to provide improvements to the end that access may be gained to the housing in which the conveying element is located to dislodge wedged objects therein also without necessitating the removal of the coal from the bin; and other objects are to provide a structure of such construction that should the conveying mechanism become inoperative the coal may be rendered accessible for shoveling by hand at the bottom of the bin.

Referring to the accompanying drawings wherein I have shown my invention as embodied in a coal tender for a locomotive equipped with stoker mechanism supplied with coal by conveying mechanism on the tender;

Figure 1 is a broken view in vertical elevation of the front end of the coal tender. Figure 2 is a section taken at the irregular line 2—2 on Fig. 1 and viewed in the direction of the arrows. Figure 3 is a section taken at the line 3 on Fig. 1 and viewed in the direction of the arrow. Figure 4 is a broken plan section taken at the line 4—4 on Fig. 1 and viewed in the direction of the arrows; and Figure 5, a plan view of the slide gate forming a part of the structure of the preceding figures.

The coal tender shown presents the coal bin portion 6 flanked by the water tank portions 7 in accordance with common practice, the floor of the bin 6 being represented at 8. Located below the floor 8 is a housing 9 which extends lengthwise of the bin 6 and substantially midway between the sides of the latter, this housing containing a conveyor device shown as an Archimedean screw 10 driven by any suitable means preferably of such character as to permit the screw to be rotated in either direction and which serves to feed coal, delivered thereto from the bin, to the conduit 11 and thence to the stoker mechanism proper (not shown) which would be installed in the locomotive. The floor of the bin 8 in practice would preferably contain an opening (not shown) adjacent its rear wall, for communication of the bin 6 with the housing 9, in accordance with common practice.

In accordance with my invention the outlet from the bin 6 into the housing 9 at the forward end of the bin, instead of comprising merely an opening located in a horizontal plane in the floor of the bin, involves the provision of a space which communicates with the interior of the housing, and with the interior of the bin and also extends above the plane of said floor, this space where it communicates with the bin being provided with a gate which may be moved into and out of a position in which this space communicates with the bin, the coal in feeding from the bin into the housing

9 discharging through this space. The structure in the preferred illustrated embodiment of my invention involves the provision of the space 12 at the forward end of the bin 6 which opens downwardly into the housing 9 through the opening 13 in the bottom plate of the bin 6 and upwardly into the bin 6 through an opening 14 presented in the frame member 15 which is secured in the bin to incline upwardly and forwardly from the bottom 8 of the latter. The frame 15 is provided with side members 16 spaced apart and of general triangular shape, which rest upon the floor plate 8 and are secured thereto against displacement as by means of removal pins 17. The inner faces of the members 16 are provided with ribs 18 which extend parallel with, and in spaced relation to, the opposed side members of the frame 15, thereby affording channels at opposite sides of the frame structure adapted to receive the opposite edges of a sliding gate 19 which is adapted to be slid to the position shown in Fig. 1 to close the opening 14 and to be entirely removed from this frame structure to open the bin 6 to the space 12. The slide gate 19 is preferably formed at its lower end with serrations, represented at 21 to adapt it to cut through the coal, and at its upper end is provided with the relatively heavy lug portions 22 at which portions it is desirable that the slide 19 be struck by a sledge or the like to drive it to position in the frame against the resistance of the coal. The front wall of the bin is formed of the stationary wall sections 23 at opposite sides thereof and coal gate sections 24 which are pivoted at their outer edges, as represented at 25, to the wall sections 23 and meet at subsantially the center line of the tender, these gates corresponding with those as commonly provided in coal tenders of the type above referred to and in practice each being formed of independently movable upper and lower sections, for the well known purpose. The lower edges of the gates 24 are cut away, as represented at 26, in order to permit them to swing to the position shown, without interference from the frame 15, it being understood that by reason of the provision of the parts as shown and explained, the space 12 opens through the front wall of the bin.

In the normal use of the structure the slide gate 19 is withdrawn from the frame 15 thereby establishing communication from the bin 6 to the housing 9, the coal flowing through the opening 14, space 12 and opening 13 into the housing. Should any object become wedged between the screw 10 and the housing 9 and interfere with the operation of the screw, the attendant upon inserting the slide gate 19 into the frame and driving it to the position shown in Fig. 1 shuts off the flow of coal from the bin 6 to the space 12 with the result that the weight exerted against the screw by the large body of coal in the bin is removed. The wedging action referred to most frequently occurs at the forward end of the housing 9 where it will be noted the passage is restricted by the vertical plate which forms the forward wall of the housing. This wall either furnishes a support to the pronged crusher plate customarily employed in devices of this character or the wall itself may act as a crusher for the coal as it is fed forward into the conduit 11. Thus shutting off the coal from the bin permits of the reverse rotation of the screw, when provision is made for such actuation as above stated, the small amount of coal which is in the space 12 having first been removed, if necessary, this reverse operation of the screw oftentimes dislodging the wedged material and restoring the conveying mechanism to operative condition. The shutting of the gate 19 also permits the attendant to readily probe the material in the housing 9 by any suitable tool introduced in the housing through the opening, into the space 12, provided in the front wall of the bin to dislodge wedged material in the housing. For this purpose the forward opening in the frame 15 is made sufficiently large to admit the body of the attendant. In other words, the mass of coal in the bin 6 is shut off from the space 12, thus permitting the carrying on of either or both of the operations above stated for dislodging wedged material, the attendant in the probing operation being stationed on the forward extension 8^a of the floor of the bin 8.

In the event that it is desirable not to interrupt the supplying of the locomotive with fuel, as, for example, where the object lodged between the screw and the housing cannot be removed as by the reversal of the screw or the probing suggested, the fireman, standing on the floor extension 8^a, may shovel the coal from the space 12 into which the coal flows from the bin 6, assuming the slide gate 19 to be withdrawn, the coal continuing to flow into this space as it is withdrawn therefrom by the fireman. If desired, the housing 15 may be removed from the bin so as not to interfere with the shovelling of the coal. The apparatus thus presents the two highly important advantages of permitting of the ready access to the housing 9 for probing the contents of the housing, or reverse rotation of the screw, without dumping the bin 6, and also permitting of the shoveling of the coal from the bin through an opening at the lower end thereof in the event that the conveyor mechanism continues inoperative.

While I have illustrated and described a particular construction embodying my invention, I do not wish to be understood as intending to limit it thereto as the same

may be variously modified and altered without departing from the spirit of the invention.

What I claim as new, and desire to secure by Letters Patent, is:

1. In a locomotive stoker, a structure formed with a coal conveying passage having a restricted portion, a movable conveying element in said passage, a coal receptacle communicating at its lower portion with said passage, said receptacle being formed with an opening adjacent the point of communication with said passage and a movable stop member adapted to be interposed in the path of the coal so as to prevent the flow of coal toward said passage and toward said opening whereby access may be gained through said opening to said passage adjacent its restricted portion.

2. In a locomotive stoker, a structure formed with a coal conveying passage having a restricted portion, a conveyor screw in said passage adapted to feed coal therethrough and to reduce the coal adjacent the restricted portion of said passage, a coal receptacle communicating at its bottom directly with said passage immediately to the rear of said restricted portion, said receptacle being formed at its side with an opening adjacent the point of communication with said passage, and a movable stop member adapted to be interposed into the path of the coal so as to prevent the flow of coal toward said passage and toward said opening whereby access may be gained through said opening to said passage adjacent its restricted portion.

3. In a locomotive stoker, a structure formed with a coal conveying passage having a restricted portion, a conveyor screw in said passage adapted to feed coal therethrough and to reduce the coal adjacent the restricted portion of said passage, a coal receptacle communicating at its bottom directly with said passage immediately to the rear of said restricted portion, said receptacle being formed at its side with an opening adjacent the point of communication with said passage, and a stop member adapted to be inserted in said receptacle through said opening into the path of the coal so as to prevent the flow of coal toward said passage and toward said opening whereby access may be gained through said opening to said passage adjacent its restricted portion.

4. In a locomotive stoker, a structure formed with a coal conveying passage having a crusher therein, a conveyor screw in said passage, a coal receptacle communicating at its bottom directly with said passage, said receptacle being formed at its side with an opening adjacent the point of communication with said passage, and a movable stop member adapted to be interposed in the path of the coal so as to prevent the flow of coal toward said passage and toward said opening whereby access may be gained through said opening to said passage and crusher.

5. In a locomotive stoker, a structure formed with a coal conveying passage having a crusher therein, a conveyor screw in said passage, a coal receptacle communicating at its bottom directly with said passage, said receptacle being formed at its side with an opening adjacent the point of communication with said passage, a frame in said receptacle adjacent said opening, and a plate adapted to be inserted through the upper portion of said opening into said frame and into the path of movement of the coal toward said passage whereby access may be gained through said opening to said passage and crusher.

6. In a locomotive stoker, a structure formed with a coal conveying passage having a crusher therein, a conveyor screw in said passage, a coal receptacle communicating at its bottom directly with said passage, said receptacle being formed at its side with an opening adjacent the point of communication with said passage, a frame in said receptacle formed with guideways extending from the upper part of the sides of said opening downwardly and inwardly over the point of communication with said passage, and a plate adapted to be inserted in said guideways so as to prevent the flow of coal toward said passage and opening whereby access may be gained through said opening to said passage and crusher.

7. In a locomotive stoker, a structure formed with a coal conveying passage having a crusher therein, a conveyor screw in said passage, a coal receptacle communicating at its bottom directly with said passage, said receptacle being formed at its side with an opening adjacent the point of communication with said passage, a frame in said receptacle formed with guideways extending from the upper part of the sides of said opening downwardly and inwardly over the point of communication with said passage, and a plate adapted to be inserted in said guideways so as to prevent the flow of coal toward said passage and opening whereby access may be gained through said opening to said passage and crusher, said frame being removable through said opening.

8. In a locomotive stoker, a structure formed with a coal conveying passage having a crusher therein, a conveyor screw in said passage, a fuel receptacle communicating at its bottom directly with said passage, said receptacle being formed at its side with an opening adjacent the point of communication with said passage, a frame in said receptacle adjacent said opening, and a plate adapted to be inserted into said frame, said plate being provided with a serrated coal engaging inner edge and with outer pro-

jections adapted to receive driving impacts, whereby said plate may be driven through the coal to prevent further movement of the coal toward said passage whereby access may be gained through said opening to said passage and crusher.

9. In a locomotive tender having a deck, a coal conveyor comprising a structure having a passage therein, a conveyor screw in said passage, said structure being provided with a coal reducing element adapted to operate on the coal as it is conveyed through said passage, a coal receptacle communicating with said passage adjacent to the rear of said element and having an elongated opening in the lower portion of its forward wall, formed with an enlargement intermediate the ends of said opening, a frame in said receptacle forming a space through which coal passes to said passage, said frame, opening through said enlargement to said deck and being itself removable through said enlargement, and said frame being further provided with an inclined removable upper wall, so positioned as to prevent the movement of coal into said passage and to permit a person to enter said box and gain access to said passage and screw, adjacent to the rear of said reducing element.

10. A locomotive tender formed with a coal receptacle, having hinged forward gates, a screw conveyor having an opening communicating with said receptacle beneath said gates, said conveyor having a crushing plate adjacent the forward end of said opening, a frame in said receptacle comprising upright plates located above the sides of said opening and formed with guideways and a plate slidable in said guideways and adapted to be driven beneath said gate through the body of coal above said opening so as to prevent the further flow of coal into said passage.

11. In a locomotive stoker, a structure formed with a coal conveying passage having a restricted portion, a conveyor screw in said passage adapted to feed coal therethrough and to reduce the coal adjacent the restricted portion of said passage, a reversible drive for said screw, a coal receptacle communicating at its bottom directly with said passage immediately to the rear of said restricted portion, said receptacle being formed at its side with an opening adjacent the point of communication with said passage, and a movable stop member adapted to be interposed into the path of the coal so as to prevent the flow of coal toward said passage and toward said opening whereby access may be gained through said opening to said passage adjacent its restricted portion.

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