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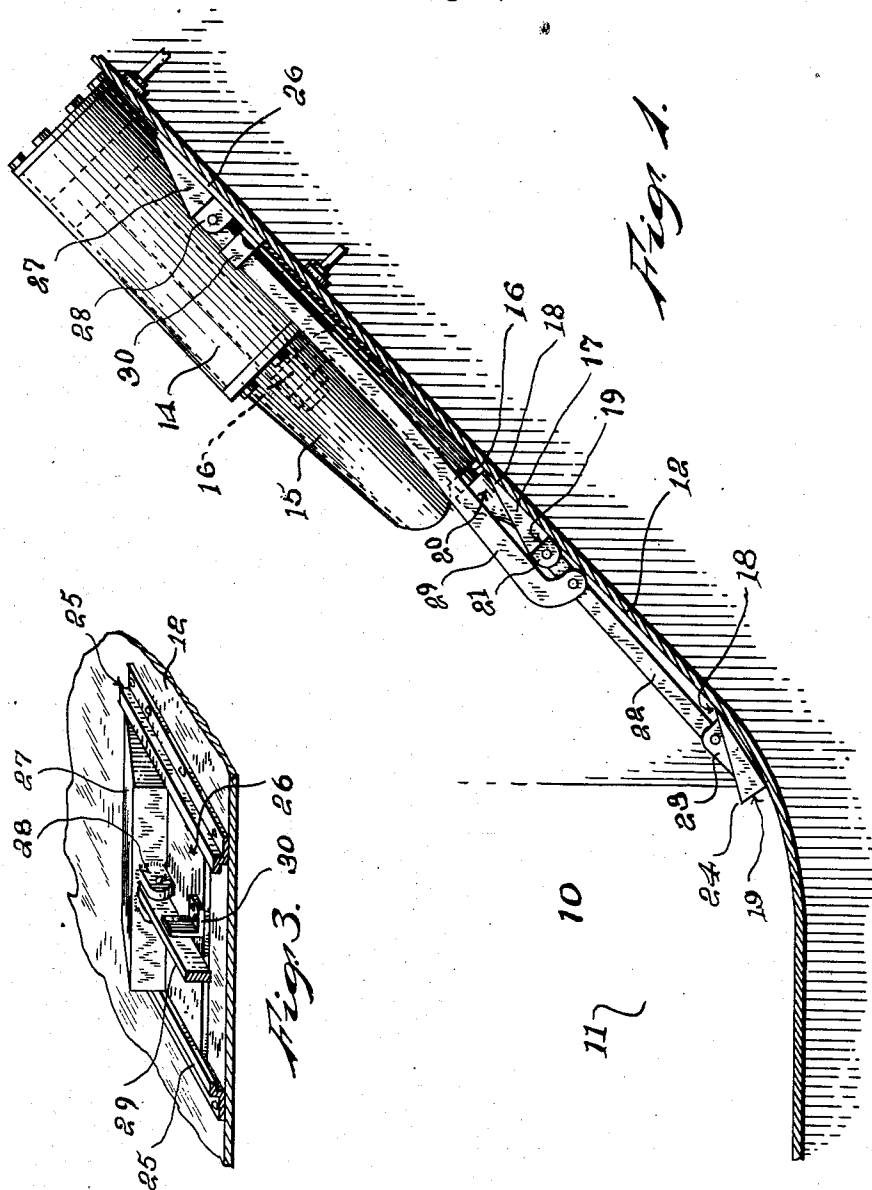
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COAL PUSHER FOR LOCOMOTIVE TENDERS

Filed Aug. 1, 1938

2 Sheets-Sheet 1



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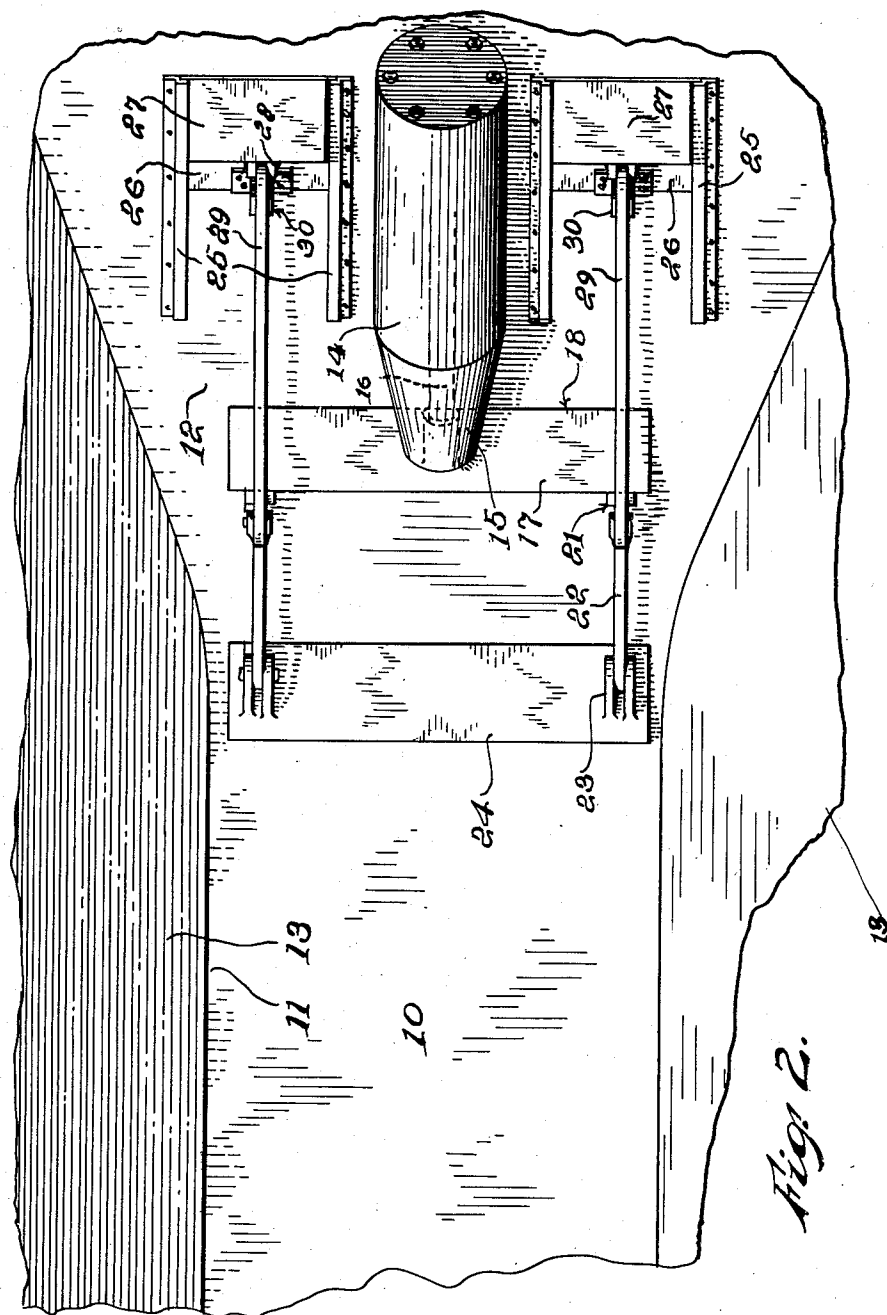
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UNITED STATES PATENT OFFICE

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COAL PUSHER FOR LOCOMOTIVE TENDERS

Roy Milburn and Wade Briggs, Muskogee, Okla.

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2 Claims. (Cl. 198—221)

The invention relates to improvements in pushers for moving coal in locomotive tenders and has for an object to effect an improvement adapted to be incorporated with pushers already in use to increase their effectiveness and utility, as well as to enable the original manufacture in tenders of improved equipment embodying my invention with a minimum of expense and without requiring structural modification of tender or standard pushers.

It has been the experience with ordinary pushers that an arch forms at the mid part of the bin and extending rearwardly supported in part on the slope sheet, so that the pushers operate under the arch without being able to move a large proportion of the coal in the bin as desired. Also, even if each arch does not extend over the pushers, much coal remains on the slope sheet. It is therefore an aim of this invention to provide a pusher construction in which such arch can not form ordinarily and proper operation of the pusher on the coal will be assured, so that all coal will be pushed forward until the reserve is depleted to a proper minimum consistent with good performance of such devices.

It is also an object to enable the incorporation of my invention on various types of pushers already in use without requiring reconstruction of the tender or pusher structure, and using principally stock materials and simple shop operations requiring no special machining.

Additional objects, advantages and features of invention reside in the construction, arrangement and combination of parts involved in the embodiment of the invention, as will be understood from the following description and accompanying drawings, wherein

Figure 1 is a longitudinal section of a tender and pusher embodying my invention.

Figure 2 is a top view thereof.

Figure 3 is a detail of one of the rear pushers. There is illustrated a tender structure including the usual bin construction 10, including side walls 11 and wear plate 12, the side walls having outwardly sloping upper parts 13. The wear plate may lie over or as shown may comprise at its rear part the slope sheet of the tender, as preferred.

On the upper and rear part of the slope sheet there is centrally mounted a steam cylinder 14 arranged longitudinally of the tender and comprising part of the motor of any standard or approved coal pusher, the operative means and controls of which are not illustrated as they may be of any usual form of which there are several well

known, and do not form a novel part of the invention.

A shield or hood 15 is extended forwardly from the cylinder, within which may operate the piston rod and an offset link connection 16 between the piston rod and the upper standard form of pusher 17, which at retracted position of the piston lies close to the extremity of the hood 15. The pusher 17 is a transverse bar or plate extending nearly the width of the forward bin space, and is substantially wedge-shaped in cross section fore-and-aft, forming a knife edge 18 toward the rear, and having a forward or front face 19 perpendicular to the plane of the bottom side of the pusher. The bottom side may rest flat upon or close to the slope sheet. Midway of its length a socket 20 is integrally formed on this pusher, presented toward the rear, in which the forward end of the link 16 is secured. On the forward face 19 of this pusher, ears 21 are formed near each end, between which links 22 are pivoted, extending forwardly and pivoted between corresponding ears 23 formed on the upper sloping face of the forward pusher 24, which is similar in cross section and length to the one 17. The links 22 are simple rectilinear bars, and the ears 21 and 23 are so located that the links are within the altitude of the front faces of the pushers and will interfere in a minimum degree with the movement of the pushers through obstruction by coal thereover. If desired, any usual form of guide rails may be mounted on the floor and slope sheet to hold the pushers to a proper path between the sides of the bin when the device is operated.

There are mounted on the upper part of the slope sheet two pairs of guide rails 25, one pair on each side of the cylinder 14, these rails being Z shaped in cross section with upwardly offset top flanges presented toward each other and spaced from the slope sheet to form guide channels. Slide plates 26 are slidably engaged under the top flanges, on the rear parts of which respective wedge shaped pusher bars 27 are secured, corresponding in cross sectional form and measurements with those of the bars 17 and 24. Ears 28 are formed centrally of the forward sides of the bars 27, between which the rear ends of links 29 are pivoted, which are extended forwardly parallel to the slope sheet a distance, and then slightly upward and forward closely over the bar 17, their forward ends being turned downwardly and bifurcated to receive therein respective links 22, to which they are pivotally

connected, so that as the bars 17 and 24 are moved, so will the bars 27 be also.

The plates 26 are extended a distance forwardly of the bars 27, and each has mounted thereon at the front edge parallel upstanding ears 30, between which the respective link 29 is held for slight vertical sliding movement, as may be required in operation of the forward pushers. The ears aid in holding the plates 26 in proper alignment with the rails 25 and prevent jamming of the plates 26 between the rails, which is a tendency at times when one end of a plate 26 or its bar 27 strikes a heavy lump of coal in the mass thereover.

In operation, the projection of the piston of the motor to its forward limit moves the forward pusher forwardly on the floor of the bin, and this moves this pusher also above the plane of the path of the rear pusher, so that the link 22 moves pivotally in the ears 21 and raises the forward ends of the links 29 slightly. The forward pusher 24 also is slightly rotated by the change of its position with respect to the perpendicular, due to its lower side moving from inclined position to approximately horizontal position on the floor of the bin. In this movement of the pushers 17 and 24 a mass of coal in the lower portion of the mass in the bin is propelled forwardly, and due to the linkage of the rear plates 26 these are also drawn forwardly, moving forward a corresponding mass of coal from under or within that located over the slope sheet. This last action breaks the footing of the arch that tends to form, and causes a constant lowering of the pile in the bin until approximately all is propelled forward, under the repeated operations of the pushers. In the retractive movements of the pushers, the flat wedge-shape of the pushers enables them to be readily drawn rearwardly under the coal with a minimum of retardance, the coal passing thereover without rearward translation.

It will be understood that while I have described a specific embodiment of the invention, it is not

limited to the particular details illustrated and various modifications thereof may be made without departing from the spirit of the invention as set forth in the appended claims.

We claim:

1. A coal pusher of the character described for a locomotive tender having a bin including a slope sheet and floor, a reciprocating piston motor mounted adjacent the slope sheet, a transverse pusher connected therewith and movable on the slope sheet, a forward pusher movable on the floor, links connected between the forward pusher and the first named pusher, upper pushers spaced rearwardly of the first named pusher on the slope sheet adjacent respective sides of the bin, and respective links pivotally connected to the front sides of the upper pushers extended forwardly over the first named pusher and downwardly and pivotally connected to the respective first named links.

2. A coal pusher of the character described for a locomotive tender having a bin including a slope sheet and floor, a reciprocating piston motor mounted adjacent the slope sheet, a transverse pusher connected therewith and movable on the slope sheet, a forward pusher movable on the floor, links connected between the forward pusher and the first named pusher, upper pushers spaced rearwardly of the first named pusher on the slope sheet adjacent respective sides of the bin, and link connections between the first named pusher and said upper pushers, said upper pushers each comprising guide rails, a flat plate fitted slidably therebetween and slidable on the slope sheet, said link connection therewith consisting of a respective link pivoted on the front side of the upper pusher close to the flat plate, and spaced ears on the flat plate spaced forwardly of the upper pusher and receiving the link slidably therebetween.

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