June 14, 1932. F. PARDEE, JR 1,863,028

LOADING CHUTE

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Fig. 1.

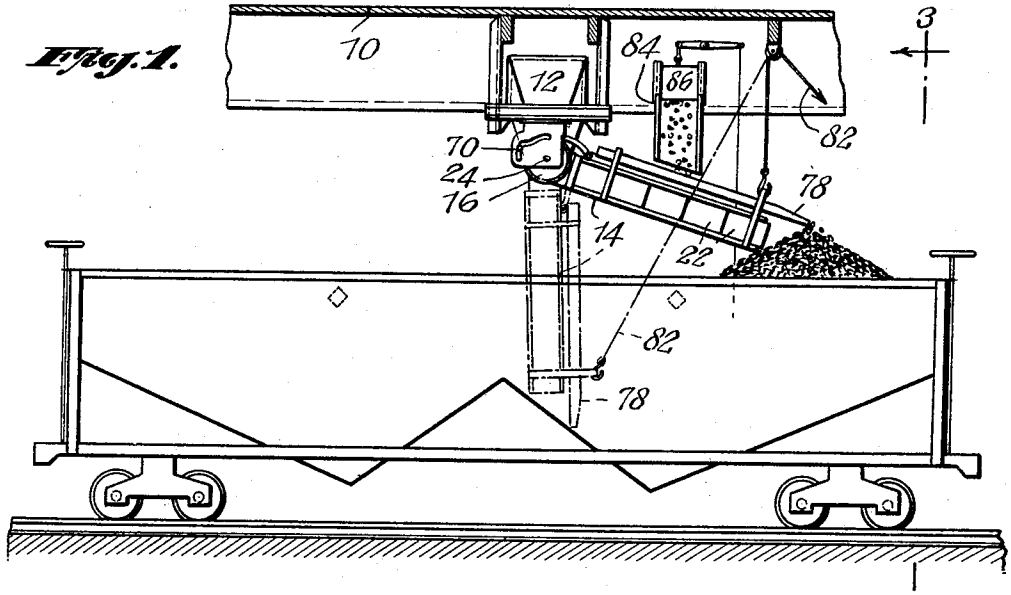


Fig. 2.

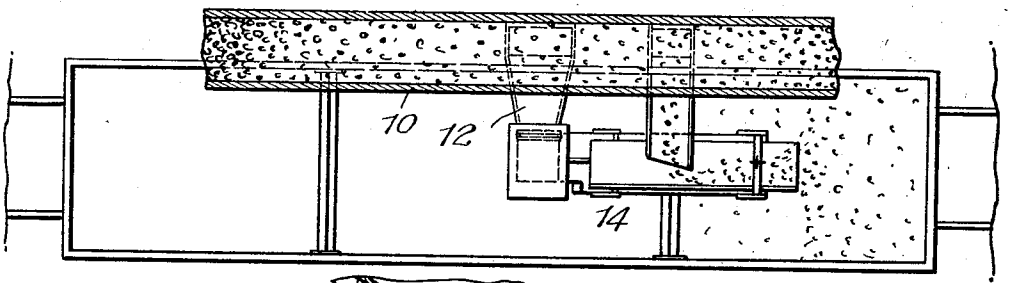
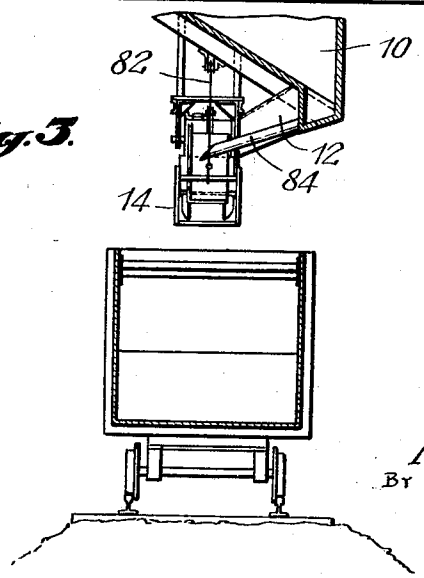


Fig. 3.



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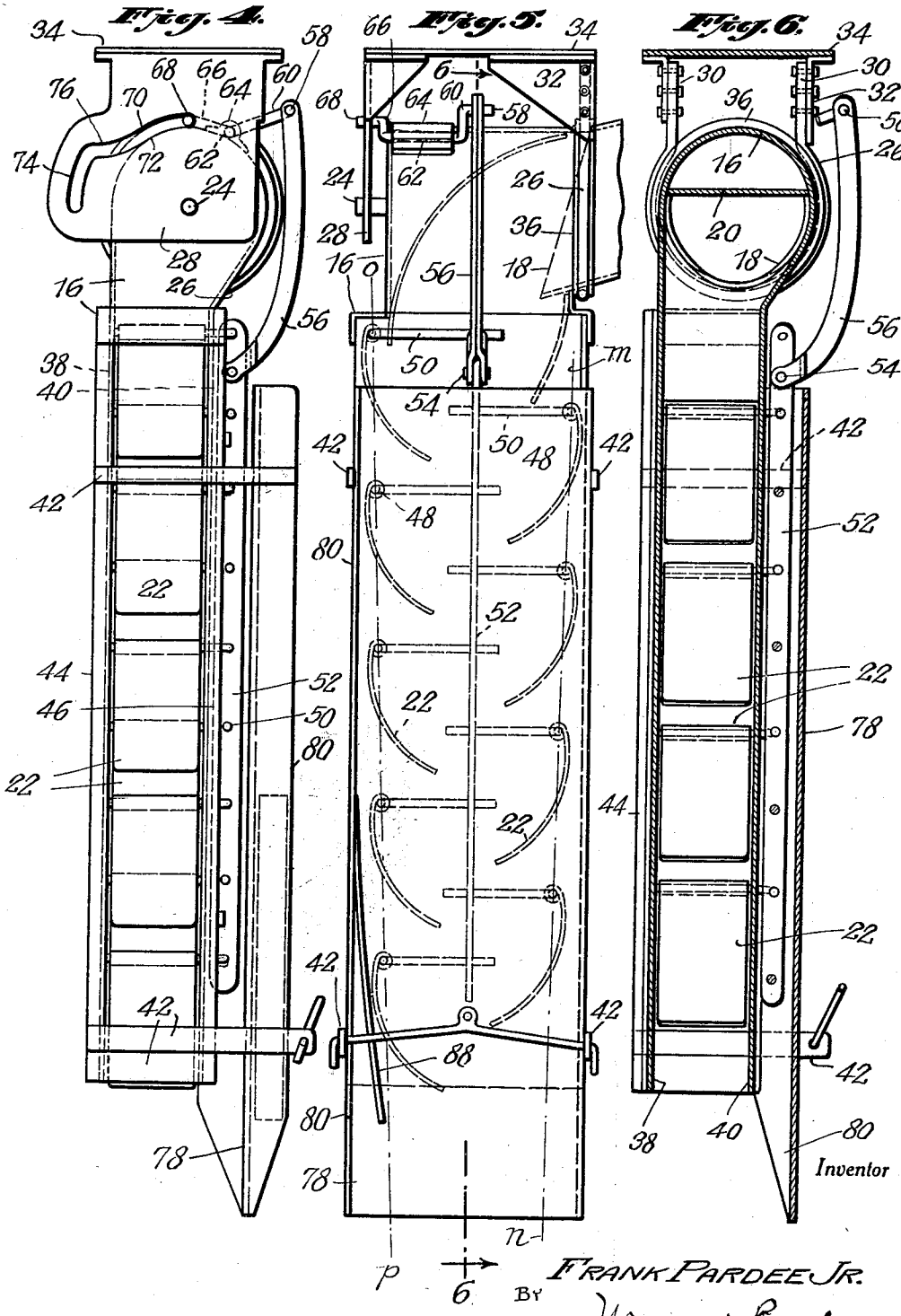
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LOADING CHUTE

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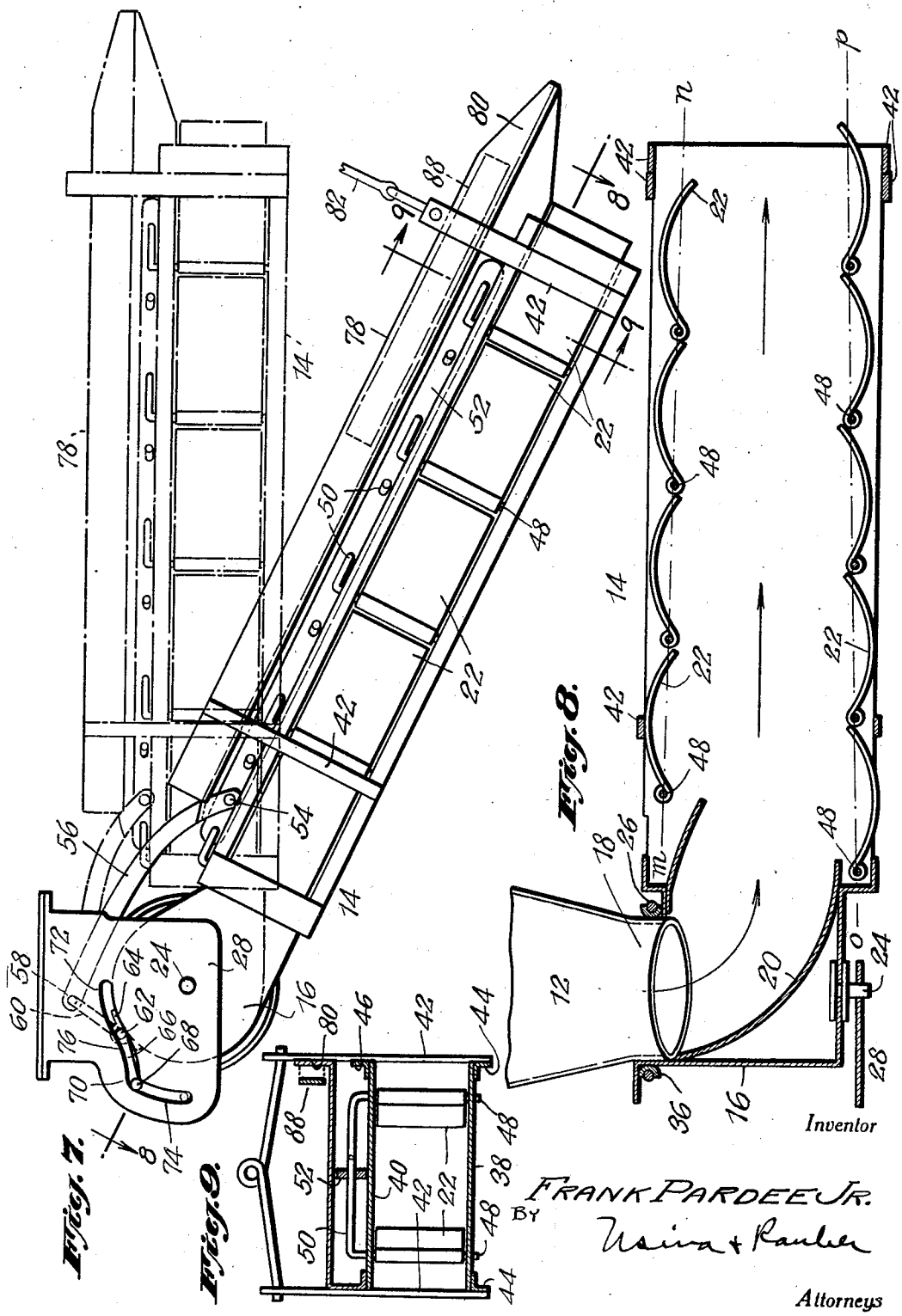


Fig. 7.

Fig. 9.

Fig. 8.

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UNITED STATES PATENT OFFICE

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LOADING CHUTE

Application filed July 15, 1930. Serial No. 468,029.

This invention relates to improvements in loading chutes which are adapted to be pivotally mounted and swung to different angular positions as the pile of material discharged thereby accumulates.

In a copending application Serial No. 375,500, filed July 2, 1929, I have shown a pivotally mounted chute with adjustable retarders therein arranged to be moved upon pivotal movement of the chute. The present invention relates to further improvements in the type of chute shown in my prior application. The invention will be apparent from the following specification when read in connection with the accompanying drawings in which:

Fig. 1 is a side elevation showing my improved loading chute in full lines in the position it assumes when topping off a pile of coal in one end of the hopper bottom car. The same view illustrates in broken lines the position assumed by the chute when starting to load the car;

Fig. 2 is a plan view of Fig. 1 with a portion of the coal storage pocket shown in section;

Fig. 3 is a vertical cross section on line 3—3 of Fig. 1;

Fig. 4 is a front elevation of my improved loading chute;

Fig. 5 is an elevation from the right side of Fig. 4;

Fig. 6 is a vertical longitudinal section on line 6—6 of Fig. 5 viewed in the direction of the appended arrows;

Fig. 7 is a view similar to Fig. 4, but showing the chute in full lines in the topping off position and in broken lines in non-operative position to permit the free passage of cars thereunder;

Fig. 8 is a longitudinal section on line 8—8 of Fig. 7;

Fig. 9 is a transverse section on line 9—9 of Fig. 7.

Referring in detail to the drawings, 10 represents a coal storage pocket having an outlet part 12 adapted to discharge coal into the upper end of the loading chute indicated as a whole at 14. The chute includes a hood 16 having a side entrance opening through which the extremity 18 of the part 12 extends. Within the hood, there is a curved baffle or guide 20 which causes the incoming coal to change its direction, as indicated by the arrows in Fig. 8, so that the material will flow between the retarder members 22.

The chute 14 is pivotally mounted for swinging movement as a whole on trunnion members 24 and 26. The trunnion member 24 comprises a stud secured to the hood 16 which extends to a bearing aperture formed in a plate 28. The trunnion member 26 as shown in Figs. 5 and 6 is a substantially U-shaped member, whose upper extremities 30 are bolted or otherwise secured to brackets 32 secured to fixed plate 34. The U-shaped trunnion member 26 is seated in a curved ring 36 secured to the hood 16 of the chute.

The chute includes plates 38 and 40 which are held in spaced relationship by skeleton frame members 42, the latter being secured to longitudinally extending angle bars 44 and 46 carried by the plates 38 and 40, respectively. The several pivoted retarder members mounted between the plates 38 and 40 jointly form the side enclosures of the chute. Thus it is clear that because of the converging arrangement of their pivots the retarder can effect a variable and gradual restriction of flow area of the chute, such restriction in area increasing from the inlet end of the chute toward the outlet end thereof.

Between the plates 38 and 40 are mounted the retarder members 22 above referred to. These members are supported on pivoted shafts 48. Each shaft 48 has an arm 50 which projects through a suitable opening in an actuating bar 52. As thus arranged, longitudinal movement of the bar 52 will cause all of the retarding members 22 to partially rotate about their pivots 48. Near its upper extremity, the bar 52 is connected by pin 54 with a link 56 which is in turn connected at 58 with a crank arm 60 formed on one end of a rock shaft 62 journalled in bracket 64 secured to the hood 16. The shaft 62 carries another arm 66 having an end 68 which projects through a cam slot 70 formed in the fixed plate 28. This cam slot has dwell portions 72

and 74 which are approximately concentric with the trunnions or pivotal mountings for the chute. These dwell portions in the cam are joined by the active portion 76.

When the chute 14 hangs down in the vertical position as shown in dotted lines in Fig. 1 and full lines in Fig. 4, the end 68 of the arm 66 will occupy the dwell portion 70 of the cam slot and the retarding members will extend an appreciable distance inwardly as shown in Fig. 5. As the chute 14 is swung on its pivotal axis on the trunnions 24—26, the shaft 62 will be rocked by the active part 76 of the cam. This will shift the actuating bar 52 which will in turn rock the retarder members outwardly to a position approaching that shown in Fig. 8. As thus arranged, it is clear that as the chute is swung from its vertical toward its horizontal position, the retarders are moved gradually to positions where they exert a gradually decreasing retarding action. This is desirable because as the chute approaches the horizontal the component force of gravity becomes less and less.

Reference to Figs. 5 and 8 will indicate that the shafts 48 for supporting the retarders are located along lines *m*—*n* and *o*—*p* which converge toward the outlet end of the chute. This arrangement is desirable for it provides a gradually decreasing area toward the outlet end of the chute. This permits a restriction in the flow near the bottom of the chute, such reduction of flow allows the coal to substantially fill the chute so that the material flows therethrough in a more or less continuous or unbroken stream. Such continuous flow minimizes the breakage.

Spaced from the plate 40 of the chute there is located a topping-off chute 78. This member is provided with a flange 80 extending along one edge thereof, which is secured to the frame members 42.

In operation, a coal car is located below the coal pocket and the chute 14 is lowered from the horizontal inoperative position dotted in Fig. 7 to the dotted position of Fig. 1. In this position, the retarders 22 will be at such an angle that a maximum retarding action is secured so as to prevent rapid flow of coal such as would cause breakage. As the pile grows in the car, the angular position of the chute is gradually changed by pulling on the cable 82. Such pulling movement swings the chute on its trunnions 24 and 26 and automatically alters the position of the retarders 22 so that they exert less and less retarding action as the chute approaches the horizontal. The topping off chute 78 provides for simultaneous discharge of material from an auxiliary outlet 84 in the coal pocket.

This outlet 84 is controlled by a suitable gate 86 which is only opened when the loading chute 14 reaches its elevated position. At this time, the angular inclination of the loading chute is such that the material will travel at a slow rate and no appreciable breakage will occur. The topping-off chute also permits delivering the material on top of a pile previously accumulated. That is, after the pile has been built up to a maximum height by discharging material from the chute space between the plates 38 and 40, additional material can be piled up without breakage by causing it to descend slowly along the topping-off chute which is mounted in spaced relationship with the chute 14. This topping off chute is provided with a baffle or deflector 88 as shown which is adapted to retard the speed of the coal and also to alter its direction of flow so that the coal will be piled in the center of the car.

Various modifications and substitutions of equivalents may be made by those skilled in the art without departing from the invention as defined in the appended claims.

What I claim is:

1. A lowering chute for coal and similar materials comprising spaced plates with pivotally mounted retarder members between them, a topping off chute secured adjacent one of said plates, an operating bar for said retarder members shielded by said topping off chute and means for pivotally supporting the aforesaid parts.

2. A lowering chute for coal and similar materials comprising spaced plates with pivotally mounted retarder members between them, a topping off chute spaced from one of said plates, an operating bar connected with said retarders and located between one of said plates and said topping off chute and shielded by the latter chute, means for pivotally supporting the chute structure as a whole and means automatically operable upon movement of the structure as a whole for shifting said operating bar.

3. A lowering chute for coal and similar materials comprising spaced plates with pivotally mounted retarder members between them, means for pivotally supporting the chute as a whole, an operating bar connected with said retarders, a fixed cam and means coacting with said cam for shifting said bar when the chute is moved about its pivotal support.

4. A lowering chute for coal and similar materials comprising spaced plates with pivotally mounted retarder members between them, means for pivotally supporting the cute as a whole, an operating bar connected with said retarders, a fixed cam comprising dwell portions substantially concentric with the pivotal supporting means for the chute and having an operative portion joining said dwell portions, a rock shaft having an arm carrying a member which coacts with said cam and means for transmitting movement from said shaft to said bar.

5. A lowering chute for coal and similar materials comprising spaced plates, having

pivotally supported retarders between them. means for moving said retarders and a side entrance hood secured to the upper end of said plates and spaced bearings for pivotally supporting said hood at opposite sides thereof one of said bearings including a substantially U-shaped fixed member embracing the hood and the other being an out-board bearing including a trunnion stud pivotally engaging an apertured member.

6. A lowering chute for coal and similar materials comprising spaced plates having pivotally supported retarders between them, means for moving said retarders, a hood connected to the upper end of the plates, said hood having a side entrance opening therein and a guide member in said hood adapted to change the direction of the incoming material and guide it to a path between said retarders and spaced bearings for pivotally supporting said hood at opposite sides one of said bearings including a substantially U-shaped fixed member embracing the hood and the other being an out-board bearing including a trunnion stud pivotally engaging an apertured member.

7. A lowering chute for coal and similar materials having two sets of pivoted retarders, the lines passing through the two sets of pivots converging toward the outlet end of the chute.

8. A lowering chute for coal and similar materials having oppositely disposed sets of retarders and pivotal supports for said retarders located along converging lines.

In witness whereof, I have hereunto signed my name.

FRANK PARDEE, JR.