D. F. CRAWFORD.

TRANSFER MECHANISM.

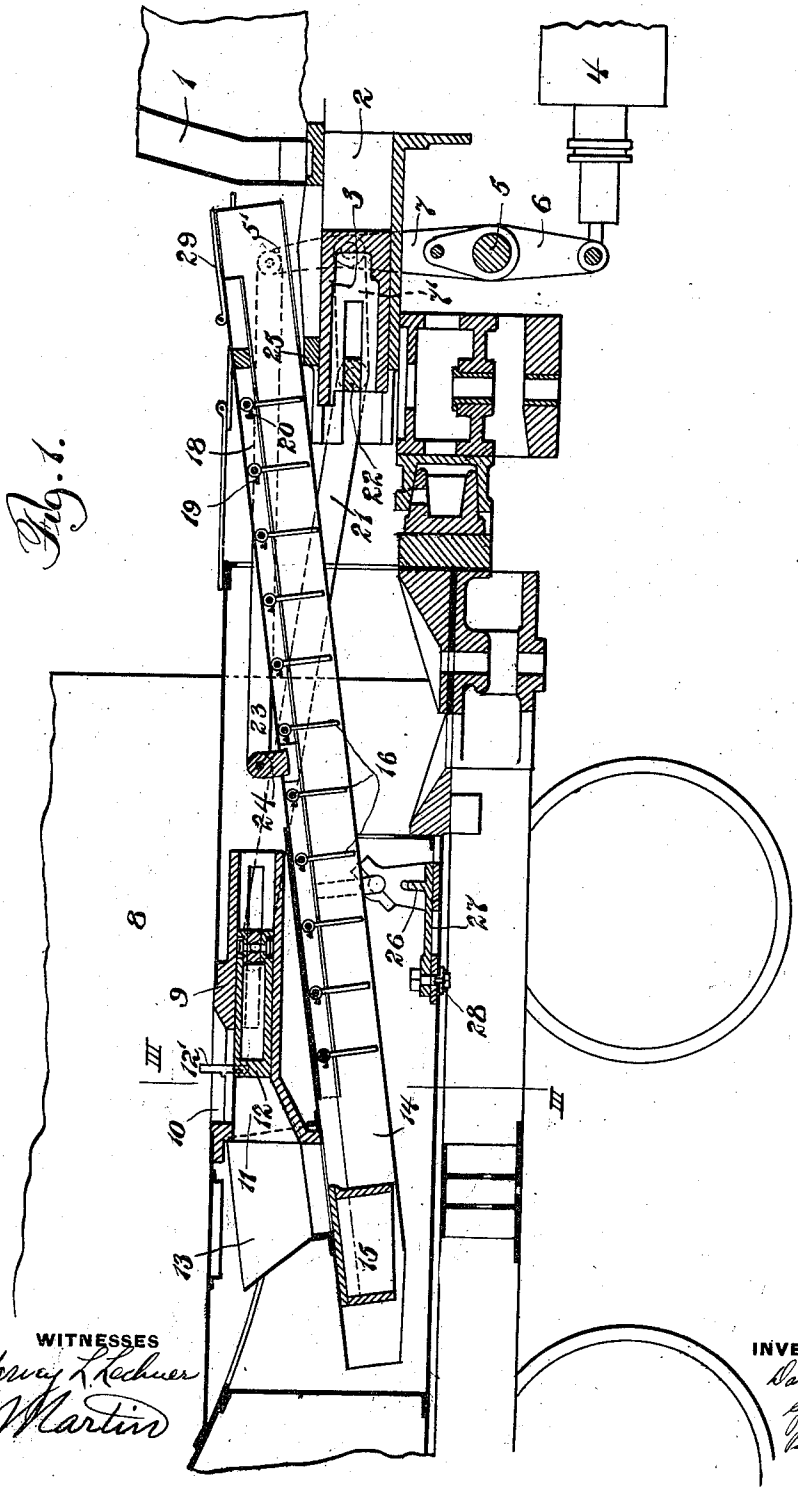
APPLICATION FILED DEC. 13, 1909.

1,000,585.

Patented Aug. 15, 1911.

2 SHEETS—SHEET 1.

Fig. 1.




WITNESSES

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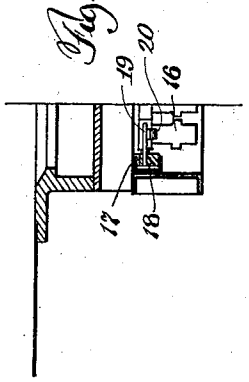
2 SHEETS—SHEET 2.

Fig. 3.



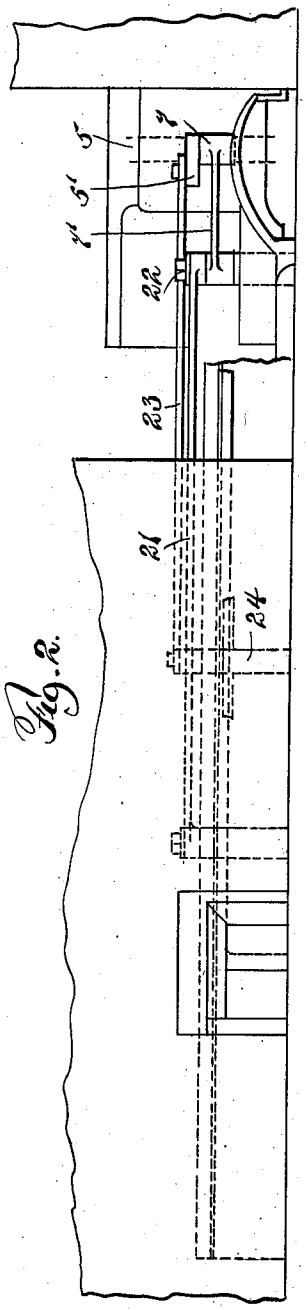




Fig. 2.

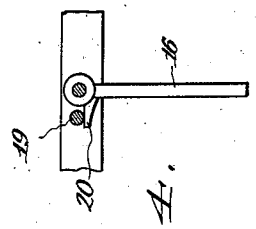



Fig. 4.

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# UNITED STATES PATENT OFFICE.

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## TRANSFER MECHANISM.

1,000,585. Specification of Letters Patent. Patented Aug. 15, 1911.

Application filed December 13, 1909. Serial No. 532,915.

*To all whom it may concern:*

Be it known that I, DAVID F. CRAWFORD, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Transfer Mechanism, of which the following is a specification.

The invention relates to transfer mechanism, and particularly to mechanism for conveying fuel from the tender of a locomotive to the stoker mechanism employed on the locomotive. The invention has for its primary objects; the provision of a simplified arrangement wherein no joints or connections are required in the transfer chute employed; the provision of an improved chute construction and improved means for supporting it; the provision of an improved construction for breaking up and feeding the coal through the chute employed; and the provision of improved feed flaps in the chute. One embodiment of the invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a longitudinal section through the mechanism as applied to a locomotive and tender,

Figure 2 is a partial plan view taken above the floor of the tender,

Figure 3 is a half section taken on the line III—III of Figure 1, and

Figure 4 is an enlarged detail section of one of the operating flaps with the stop rod employed therewith.

Referring to the drawings, the principal parts may be briefly enumerated as follows; 1 is the fire-box of the locomotive, which may be of any approved type; 2 is a receiving or feed chamber which opens into the fire-box, and from which the coal is forced by means of the piston 3; 4 is a steam cylinder located at the side of the fire-box and furnishing the power for operating the feed piston 3; 5 is a transverse shaft carrying the crank arm 6 connected to the piston of the steam cylinder, and the crank arms 7 carrying the connecting rods 7′ from which the feed piston 3 is reciprocated, there being a crank arm 7 and connecting rod 7′ on each side of the feed chamber 2; 8 is the tender of the locomotive provided in its bottom with the casting 9 in which is a vertical outlet passage 10 and a transverse passage 11; 12 is a piston working in the transverse passage 11 and adapted to feed the coal rearwardly and crush up the larger lumps, such piston being provided with a series of stirring rods 12′ to prevent the coal from bridging above the outlet passage 10; 13 is the hopper into which the coal from the passage 11 is discharged; 14 is a chute having its top open to receive the discharge from the hopper 13 and extending forwardly to a position above the feed chamber 2 of the locomotive, the bottom of such chute being open above the feed chamber 2 to permit a discharge thereto; 15 is a feed piston working in the rear end of the chute 14 and adapted to give the coal discharged into the chute from the hopper 13, its preliminary forward movement; and 16 are a series of feed flaps or plates for advancing the fuel through the chute 14.

The chute 14 is preferably made of sheet metal and is provided at its upper inner edges with channels 17 (Fig. 3). Mounted in these channels are the operating rods 18 upon which the feed flaps 16 are pivotally supported. As indicated in Figure 3 each flap consists of a plurality of independently movable strips or fingers, which divided arrangement increases the efficiency of the flaps as a lump of coal lodged beneath the flap can render only a portion of the strips ineffective, instead of the whole flap being held up, as is the case where the flaps are made in one piece. Rods 19 are provided upon the bars 18 against which the stops 20 on the strips forming the flaps 16 are adapted to engage, so that the flaps, while free to swing forwardly, are prevented from swinging rearwardly. The bars 18 are connected at their rear ends with the piston 15, so that when the bars are reciprocated to move the flaps 16, the piston 15 is also reciprocated. The piston 12 is reciprocated by means of a pair of connecting rods 21 (Figs. 1 and 2), arranged on either side thereof and having pivotal connection at their ends to the transverse shaft 22 through the piston 3. The bars 18 and the piston 15 are reciprocated from the shaft 5 by means of the crank arms 5′ on the shaft 5 and connecting rods 23, which connecting rods are pivoted at their front ends to the upper ends of the crank arms 5′, and at their rear ends to a block 24 secured to the bars 18. The crank arms 5′ are made of greater length than the crank arms 7 which operate the pistons 3 and 12 in order that the feed of the flaps 16 in the chute may be

relatively greater than that of the pistons 3 and 12, thus avoiding the danger of clogging in the chute and rendering the feed more free. The chute 14 rests at its front end upon a supporting block 25 on the locomotive, and is freely movable in all directions upon such support. At its rear portion the chute is trunnioned upon a pair of bearings 26 mounted upon the tender, and the plate 27 carrying the bearing is pivoted at 28, the arrangement thus providing for relative universal movement between the tender and locomotive without cramping or twisting the chute, and without interfering with the operating mechanism in any manner. The chute 14 is provided with an opening above the piston 3, so that the operator is enabled to supplement the feed of the conveyer by hand if desired, such opening being protected by a door 29. The discharge end of the passage 11 is enlarged (Fig. 1) to avoid a too great and undesirable breaking of the coal at this point.

The operation of the mechanism will be readily understood from the foregoing description. The coal in the tender feeds by gravity into the lateral passage 11, and the piston 12 not only serves to feed this coal rearwardly into the hopper 13, but also serves to break up the larger lumps so that all danger of clogging is avoided during the passage of the fuel through the chute 14, and no hand labor is necessary to reduce the coal to proper size for use in the fire-box. As the piston 12 moves rearwardly to permit a fresh charge of fuel to fall in front thereof, the piston 15 moves forwardly forcing the coal fed into the chute forwardly to a position where it can be engaged by the rear flaps 16. These flaps 16 forward the fuel to the chute step-by-step until it falls by gravity through the bottom of the chute into the feed chamber 2, and is then forced into the fire-box by the piston 3.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is the following:—

1. In combination in apparatus for supplying coal to a locomotive fire-box, a tender provided with a gravity discharge passage, a piston working transversely thereof, means for reciprocating the piston, a forwarding chute to which the piston discharges, reciprocating forwarding means therein, and means for reciprocating the forwarding means, the stroke of the forwarding means being greater than that of the piston.

2. In combination in apparatus for supplying coal to a locomotive fire-box, a tender provided with a gravity discharge passage, a piston working transversely thereof, a feed piston for feeding the fuel to the fire-box, a chute intermediate the two pistons provided with a reciprocatory forwarding means, a rock shaft, crank arms thereon of different length for operating the feed piston and the forwarding means respectively, connecting rods extending between the crank arms and the forwarding means and feed piston, and a connecting rod between the feed piston and the first mentioned piston, the crank arm for operating the forwarding means being longer than the crank arm for operating the feed piston.

3. In combination in apparatus for supplying coal to a locomotive fire-box, a tender provided with a gravity discharge passage, a piston working transversely thereof, a feed piston for feeding the fuel to the fire-box, a chute intermediate the two pistons provided with a reciprocatory forwarding means, and means for operating the pistons and the forwarding means, the said chute being provided in its top above the feed piston with an opening to permit of an auxiliary hand feed.

4. In combination in transfer mechanism, a transfer chute, a piston in the chute for giving material supplied in front thereof a preliminary forward feed, reciprocatory forwarding means in front of the piston for moving the material step-by-step through the chute, and mechanism for reciprocating the piston and forwarding means, the stroke of the forwarding means being greater than that of the piston.

5. In combination in apparatus for supplying coal to a locomotive fire-box, a transfer chute, reciprocatory operating means mounted for movement longitudinally of the chute, and a plurality of forwarding flaps carried by said operating means pivoted to swing freely forward but held against movement in the reverse direction, and each consisting of a plurality of parts freely movable independently of each other, the said parts having their opposing side edges closely adjacent each other so that together they form substantially continuous flaps.

In testimony whereof I have hereunto signed my name in the presence of the two subscribed witnesses.

DAVID F. CRAWFORD.

Witnesses:
HARVEY L. LECHNER,
DOERING BELLINGER.