Oct. 21, 1924. 1,512,812

O. ARAM

STOKER MECHANISM

Filed July 15, 1920

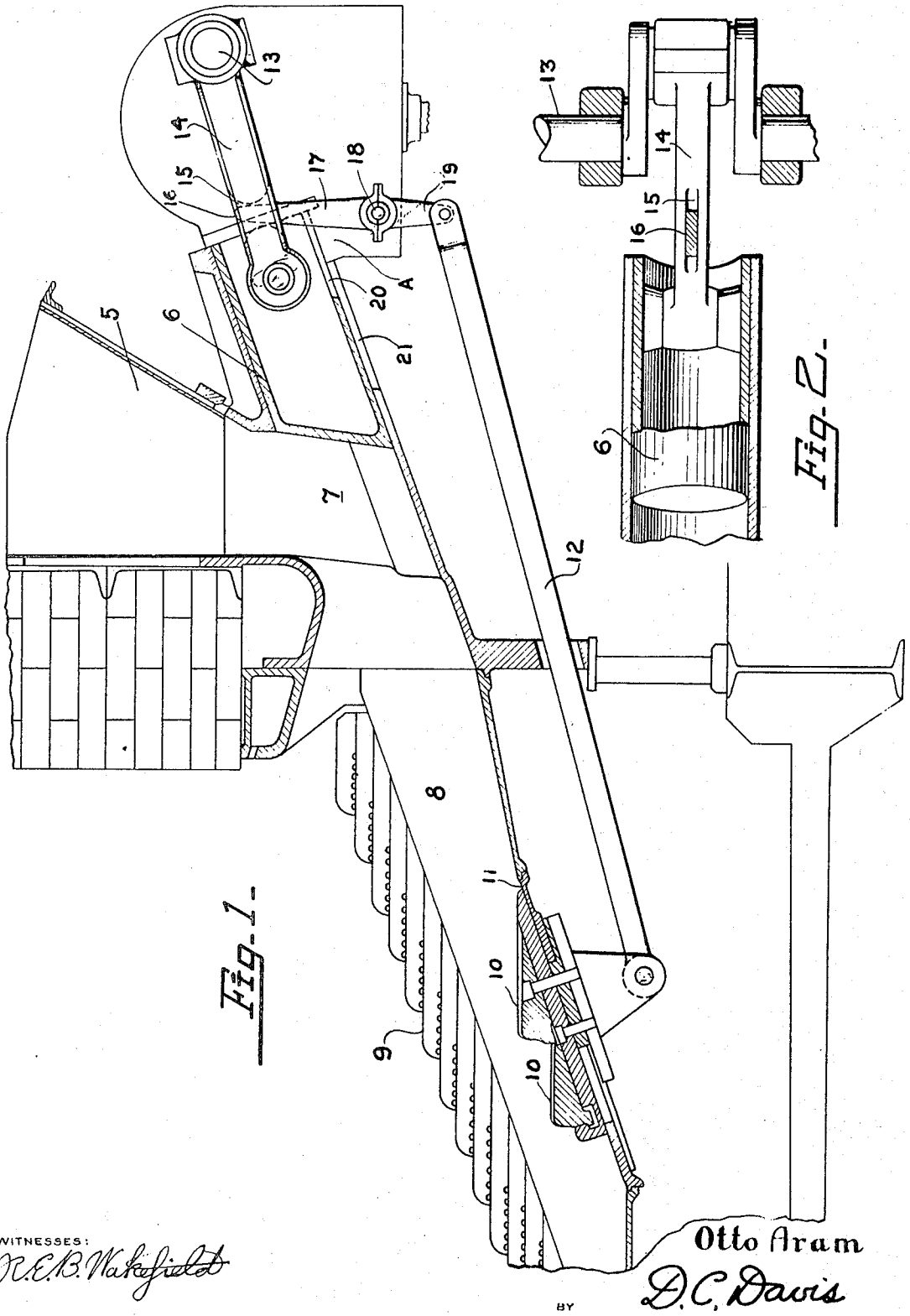


Fig. 1.

Fig. 2.

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STOKER MECHANISM.

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To all whom it may concern:

Be it known that I, OTTO ARAM, a citizen of the United States, and a resident of Essington, in the county of Delaware and State of Pennsylvania, have invented a new and useful Improvement in Stoker Mechanism, of which the following is a specification.

This invention relates to stokers, and particularly to the mechanism for driving and controlling the movement of reciprocating rams, grates and agitators employed therein, and it has for an object the provision of a simple and durable driving connection between the main ram-driving mechanism and the secondary rams or moving grates commonly used in underfeed stokers.

Another object is to produce a driving connection requiring a minimum amount of machine work, and which may be readily assembled or readily replaced without material disturbance to the other parts of the apparatus.

These and other objects are attained by means of stoker mechanism embodying the features herein described and illustrated in the drawings accompanying and forming a part hereof, wherein:

Fig. 1 is a vertical longitudinal section through a stoker embodying the features of my invention.

Fig. 2 is a plan view of the driving connections showing the plunger in horizontal section.

Referring to the drawing, the stoker to which the improved apparatus is applied, as shown, includes the usual fuel hopper 5 and ram 6 which is reciprocated beneath the fuel discharge opening 7 for the purpose of forcing fuel into the longitudinally extending retorts 8. It will be understood that the stoker may be provided with any desired number of retorts, each having fuel-feeding and agitating mechanism similar to that illustrated in Fig. 1, and that the fuel is forced upward out of the retorts on parallel rows of tuyeres 9 disposed longitudinally between the retorts. The fuel upon the lower portion of the grate is agitated by means of secondary or auxiliary rams 10 which slide forward and rearward upon the bottom wall 11 in each of the retorts and which are reciprocated by means of operating bars 12, one of which is shown.

The stoker construction above described is of the underfeed type which is well known in the art. This invention is principally concerned with an improved means for connecting the various rams and fuel agitators with the driving mechanism and these means include the usual crank shaft 13 disposed opposite the end of the ram 6. The crank shaft 13 and the ram 6 are operatively connected by a rod 14 which is adapted to impart reciprocating motion to the ram when the crank shaft is rotated. The connecting rod 14 is provided intermediate its ends with a vertical slot 15 which is adapted to receive the upper end 16 of an operating lever 17 which is pivoted upon a shaft 18 disposed beneath the fuel hopper. The lower end 19 of the lever 17 is connected with the secondary ram 10 by means of the bar 12, and it will be seen that when the lever 17 is oscillated, reciprocatory motion is imparted to the ram.

The underside of the plunger 6 is provided with a longitudinal slot 20 which registers with a similar slot 21 provided in the bottom of the hopper casting 5. These slots are provided for the purpose of permitting free movement of the lever 17 into the position indicated at A in dotted and dash lines. The rod 14 is free to move vertically with respect to the lever 17 by reason of the sliding engagement of the lever with the rod and, therefore, when the crank shaft is rotated, the plunger 6 will be reciprocated and the lever 17 oscillated. When the fuel-feeding ram 6 is moved rearward by the rod 14, the same movement of the rod will cause the secondary ram connected to the lever 17 to be moved forward. Thus, it will be seen that the ram 6 and the secondary ram always move in opposite directions, a feature of manipulation which has certain well known advantages in causing proper distribution of the fuel.

No machine work is required for the sliding connection of the lever 17 with the rod 14, because the slot 15 may be formed when the rod 14 is cast or forged, as the case may be, and no finish is required for the end of the lever which operates in the slot as it is desirable that there be sufficient lost motion between the parts to permit free relative movement thereof.

While I have shown the driving apparatus in connection with the secondary ram of an underfeed stoker, it is obvious that the

apparatus may be employed to operate moving grates or rams of stokers of any type employing such moving parts.

While I have described and illustrated but one embodiment of my invention, it will be apparent to those skilled in the art that various changes, modifications, additions and omissions may be made in the apparatus described and illustrated without departing from the spirit and scope of my invention, as set forth by the appended claims.

What I claim is:—

1. Stoker mechanism comprising a fuel feeding element, a fuel ram mounted for reciprocation in said fuel feeding element, a fuel agitating member, a rotary crank shaft, a connecting rod pivotally connected to the ram and crank shaft whereby rotary movement of the crank shaft imparts reciprocatory movement to the ram, the said rod being provided with a vertical slot, a rocking lever fulcrumed at an intermediate point having one end projecting into the slot whereby the operation of the said rod imparts oscillatory movement to the said rocking lever, and means connecting the other end of rocking lever with the said fuel agitating member.

2. Stoker mechanism comprising a fuel feeding element, a main fuel ram mounted for reciprocation in said fuel feeding element, a fuel agitating member, a rotary crank shaft, a connecting rod pivotally connected to the ram and crank shaft, whereby rotary movement of the crank shaft imparts reciprocatory movement to the ram, the said rod being provided with a slot intermediate the points of connection of the rod with the ram and crank shaft, a rocking lever pivoted beneath the axis of the ram at an intermediate point and having its upper end projecting into the slot whereby the operation of the said rod imparts oscillatory movement to the said rocking lever, and means connecting the lower end of the said rocking lever with the said fuel agitating member.

3. Stoker mechanism comprising a fuel feeding element, a fuel ram mounted for reciprocation in said fuel feeding element, a fuel agitating member, a rotary crank shaft, a connecting rod pivotally connected to the ram and crank shaft whereby rotary movement of the crank shaft imparts reciprocatory movement to the said ram, a rocking lever pivoted for oscillatory movement and having one end in vertically sliding operative engagement with the connecting rod whereby vertical movement of the rod with respect to the lever is permitted and whereby oscillatory motion is imparted to the lever when the crank shaft is rotated, and means connecting the other end of the said lever with the said fuel agitating means.

4. Stoker mechanism comprising a fuel feeding element, a main fuel ram mounted for reciprocation in said fuel feeding element, a fuel agitating member, a rotary crank-shaft, a connecting rod pivotally connected to the ram and crank-shaft, whereby rotary movement of the crank-shaft imparts reciprocatory movement to the ram, the said rod being provided with a slot intermediate the points of connection of the rod with the ram and crank-shaft, a rocking lever pivoted intermediate its ends beneath the axis of the ram and having its upper end projecting into the slot whereby the operation of said rod imparts oscillatory movement to the rocking lever, and means connecting the lower end of the said rocking lever with said fuel agitating member, whereby the reciprocatory movement imparted to the fuel agitating member is opposite in direction to that imparted to the main fuel ram.

In testimony whereof, I have hereunto subscribed my name this 9th day of July, 1920.

OTTO ARAM.