J. C. CASLER.

FEEDING ATTACHMENT FOR STOKERS AND THE LIKE.

APPLICATION FILED APR. 21, 1921.

1,415,146.

Patented May 9, 1922.

2 SHEETS—SHEET 1.

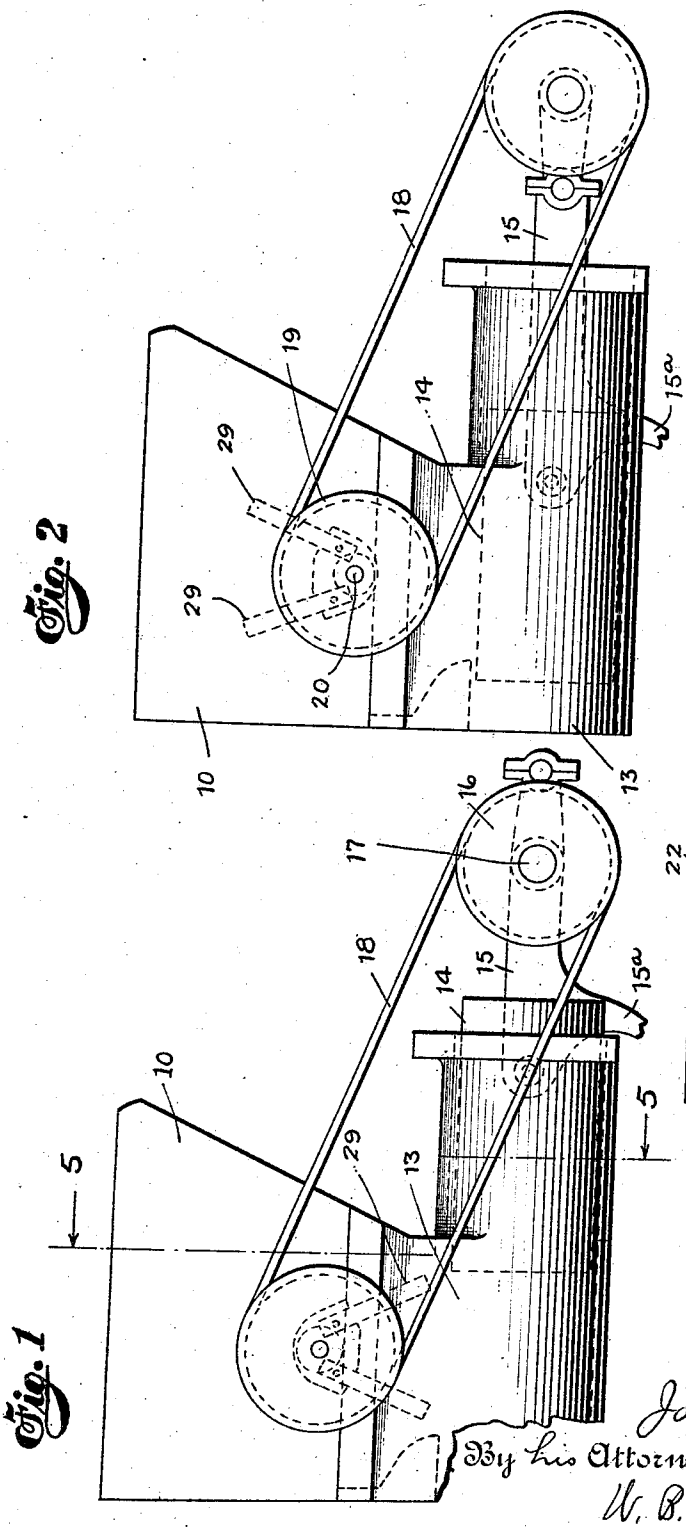


Fig. 2

Fig. 1

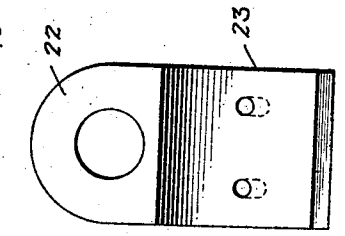


Fig. 4

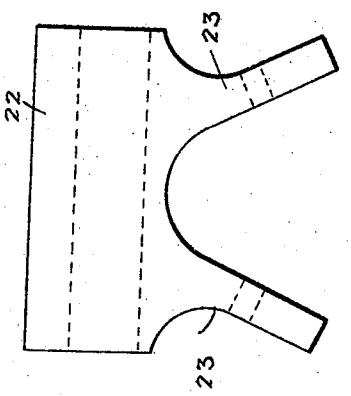


Fig. 3

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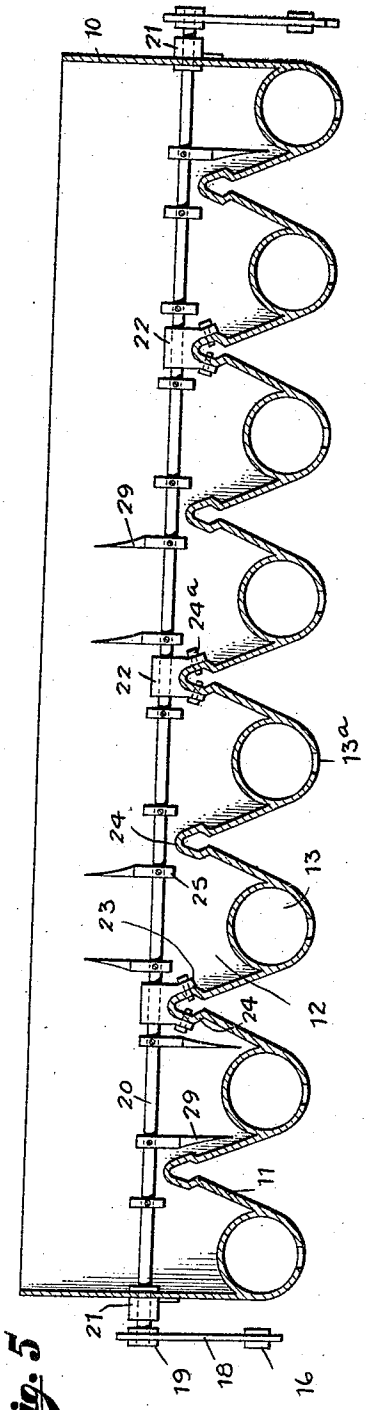


Fig. 5

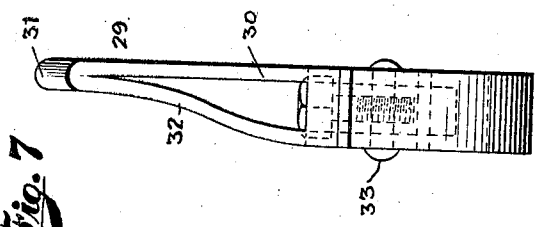


Fig. 7

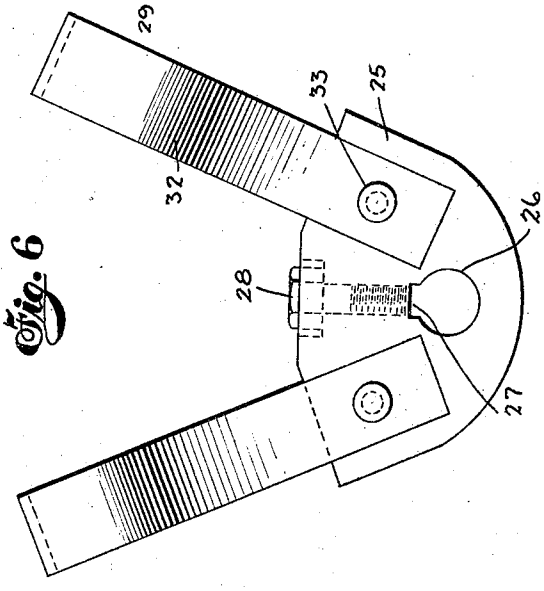


Fig. 6

John. C. Casler, Inventor,

By his Attorney,

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UNITED STATES PATENT OFFICE.

JOHN CLIFFORD CASLER, OF CHICOPEE FALLS, MASSACHUSETTS.

FEEDING ATTACHMENT FOR STOKERS AND THE LIKE.

1,415,146. Specification of Letters Patent. Patented May 9, 1922.

Application filed April 21, 1921. Serial No. 463,427.

To all whom it may concern:

Be it known that I, JOHN C. CASLER, a citizen of the United States, and a resident of Chicopee Falls, Hampden County, Massachusetts, have invented a new and useful Improvement in Feeding Attachments for Stokers and the like, of which the following is a full, clear, and exact description.

My invention relates to improvements in feeding attachments for furnace stokers and similar structures, and the general object of my invention is to produce a simple and dependable structure which will keep the fuel and other material thoroughly broken, and cause it to run smoothly and positively in front of the stoking plungers. My invention relates more particularly to that class of structures in which a hopper is provided with pockets delivering into chutes or cylinders in which plungers reciprocate to force the material to the furnace. In practice it is found that the fuel will not flow by gravity, and various forms of agitators have been used, but all have been more or less unsatisfactory. The fuel clogs and arches in the pockets just above the chutes or cylinders, and the feed is not positive and even. Attempts have been made to obviate this by different devices, some of which oscillate in the hopper, but I have found that it is necessary to have cutting blades which will rotate in the pockets of the hopper and descend far enough to absolutely cut the material near the sidewalls and at the entrance to the chutes or cylinders, so that there will be no possibility of clogging. By carrying out this idea and arranging the blades so that they will descend to the entrance of the chute or cylinder when the plunger is in its outer position and will be rotating in the same plane at a higher elevation when the plunger is moved forward, the difficulties are overcome, and a sure, constant feed is maintained. My invention is further intended to produce a strong, simple, and durable structure for carrying the above arrangement into effect, and also to produce a structure which is not expensive and can be easily applied to existing types of hoppers and feed pockets.

My invention is particularly intended to work in connection with stokers for furnaces, and more especially under-fed furnaces, but it will be seen from the description which follows that the feeding attachment can be used in connection with the plunger arrangement referred to, for breaking up and feeding material to retorts and the like, as for instance coal or coke in the distillation of such materials, sawdust and finely divided wood in the distillation of wood, and in fact any materials which are more or less finely divided and are fed to their ultimate point of consumption by a plunger mechanism. This will be better understood from the description which follows.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar reference characters indicate corresponding parts in all the views.

Figure 1 is a broken side elevation of a stoking apparatus provided with my improvements, showing a plunger in its retracted position.

Figure 2 is a view similar to Figure 1, but with the plunger moved forward to inject material to the furnace.

Figure 3 is a detail side elevation of one of the bearings for the agitating shaft.

Figure 4 is an end view of the structure shown in Figure 3.

Figure 5 is a cross section on the line 5—5 of Figure 1,

Figure 6 is an enlarged side elevation of a pair of cutting blades showing the means of attaching them to their shaft, and

Figure 7 is an edge view of the structure shown in Figure 6.

By way of example I have shown my invention applied to the common type of hopper 10, which has a series of pockets 12, and there can be one or more of these, usually a considerable number, however, and the pockets are formed by inclined walls 11, and they deliver into the several parallel chutes or cylinders 13. Plungers 14 reciprocate in these cylinders and force the fuel forward into the furnace. These plungers can be operated in any usual or preferred way, and I have shown the customary means in which piston rods 15 have a crank connection with the shaft 17, and in which the piston rods have pendent arms 15^a sliding in slots 13^a in the bottom of the cylinders. The shaft 17 is suitably supported and connects by a belt 18 with a pulley 19 on the agitator shaft 20. I have shown an ordinary belt and pulley, but in practice these

would preferably be sprocket wheels and chains, but any suitable driving connection can be used without affecting the invention.

The shaft 20 extends transversely through the hopper 10 just above the tops of the pockets 12, and is mounted at the ends in suitable bearings 21, and at intervals through the pocket in bearings 22. These bearings 22 form a convenient means of supporting the shaft rigidly, and each bearing is in the form of a journal box having pendent and diverging arms 23 which straddle the crown 24 of the merging pocket walls 11, this part 24 being preferably formed by slightly corrugating the walls 11 below the crown 24, thus giving it additional strength and better clearance. The arms 23 are secured to the members 24, that is to the upper part of the walls 11, by bolts 24^a, but they can be fastened in any suitable way.

The shaft 20 is rotatable, and it carries a series of blades 29 which can be secured to the shaft in any suitable and strong manner, but I preferably make the connection as shown and described below, in order that it may be simple, positive, and rigid. Said connection comprises a block or member 25 which has a bore 26 to fit the shaft 20, and which has preferably a keyway 27 so that it may be keyed to the shaft, and it is also fastened by a bolt 28, thus making the connection rigid and simple to apply.

Each blade 29 must be strong and capable of cutting through the material without buckling or breaking, and I prefer to make it in the form shown, in which the blade has a straight side 30, is doubled over at the end as shown at 31, and then returned upon itself in a curve 32, the opposite ends being rigidly secured to the member 25 by through bolts or rivets 33. If desired the edges of the blades can be thinned. These blades are subjected to great strain, and it will be seen that they are rigidly secured on the shaft, that they pass through the material edgewise, and that by having the curved member 32 meet the member 30 at the outer end, the curved member acts as a brace. This is desirable because the blades are subjected to very severe strain.

These blades are arranged in pairs, and diverge from the member 25 as shown in Figures 1, 2, and 6, and they are grouped upon the shaft 20 so that there will be two pairs to each pocket 11, and they are positioned so that when ground down they will enter the narrowest part of the pocket close to the sides, and at the entrance to the chute or cylinder 13 beneath. It is particularly important that the groups of blades be assembled and the shaft timed so that when a piston 14 is in its retracted position as in Figure 1, the blades 29 will be in their most downward position at the entrance to the chute or cylinder 13, and when the piston is in its forward position as shown in Figure 2, the blades for that particular pocket will be in their upermost position, as shown in the same figure. Thus it will be seen that there is no possibility of clogging or of arching of the material in the hopper, because the blades on both sides of a pocket crush through the material at the entrance to the cylinders just in advance of the forward stroke of the plunger 14, and while the cylinder is making this forward stroke, the continued movement of the blades breaks up the material above. As a result the fuel must feed positively to its appropriate cylinder, and the whole system of plungers and chutes is therefore doing the work that is expected of it, with the result that the stoking is perfectly carried out.

As stated the invention is shown as adapted for use with an under feed furnace having a stocker of the plunger type, but it will be readily seen that the same arrangement applies to similar feeding devices for retorts and the like in distillation processes.

I have shown and described the preferred embodiment of my invention, but some of the details of the structure can be departed from without affecting the invention, the important thing being to have the cutting blades arranged substantially as shown, that is so that they will rotate in the feed pockets in such a manner as to crush through the fuel at the entrance to the feed cylinders and in advance of the stroke of the plunger of such cylinder.

I claim:—

1. A feeding device for stokers of the plunger type, having pockets delivering into the plunger cylinder, and comprising rotating blades arranged in each pocket and arranged to move downward in the pocket in advance of the plunger.

2. A feeding attachment for stokers of the plunger and pocket type, comprising rotating blades turning in the pocket and timed to swing downward in the pocket in advance of the plunger stroke, and to swing upward in the pocket as the plunger is retracted.

3. In a stoking attachment of the pocket and plunger type, a feeding device comprising rotating blades moving in the pockets in a vertical plane and spaced apart so as to enter the pocket near opposite sides of the entrance to the pocket cylinder, and to move downward in advance of the plunger.

4. A feeding attachment for stokers of the pocket and plunger type having a hopper with a plurality of transverse pockets delivering into cylinders in which feed plungers move, and comprising a transverse shaft extending through the hopper above the pockets, and blades secured to the shaft and rotating therewith, said blades being arranged to enter the pockets and swing down-

ward in each pocket in advance of the plunger for said pocket.

5. The combination with the hopper having a series of pockets delivering into cylinders in which feed plungers move, of a transverse shaft extending through the hopper above the pockets, and blades spaced apart on said shaft and arranged in opposed pairs, each pair being adapted to swing downward into the pocket to a point near the entrance to the cylinder thereof in advance of the plunger for said cylinder.

6. The combination with the hopper and its feed pockets delivering into cylinders having reciprocating plungers, of a shaft extending transversely through the hopper and mounted in bearings on the walls of the pockets, and blades secured to said shaft and arranged in opposed pairs adapted to swing downward into the pockets and timed so that each pair of blades will move downward in the pocket to a point near the entrance to its cylinder in advance of the plunger for said cylinder.

7. In a structure of the kind described having feed pockets as shown, the combination with the rotary shaft carrying blades, of the bearings for said shaft, each comprising a journal box having diverting arms straddling the wall of adjacent pockets and secured thereto.

8. In a structure of the kind described, the combination with the rotary shaft, of a block rigidly fastened to the shaft, and blades on the block, each blade being generally flat and arranged to move edgewise in the plane of rotation, the blades comprising opposed side members which straddle the block to which they are rigidly fastened, and the said side members meeting at their outer extremities.

9. In a structure of the kind described, the combination with the hopper and its rotating shaft, of a block or member rigidly secured to the shaft, and diverging blades rigidly fastened to said block or member, each blade comprising opposed side members generally flat and arranged to move edgewise in the plane of rotation, the said side members of each blade straddling the block and meeting at their outer extremities.

JOHN CLIFFORD CASLER.

Witnesses:
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WILLIAM J. FREY.