Dec. 4, 1945. R. T. FRENCH 2,390,062

SPREADER STOKER MECHANISM

Filed June 30, 1943 2 Sheets-Sheet 1

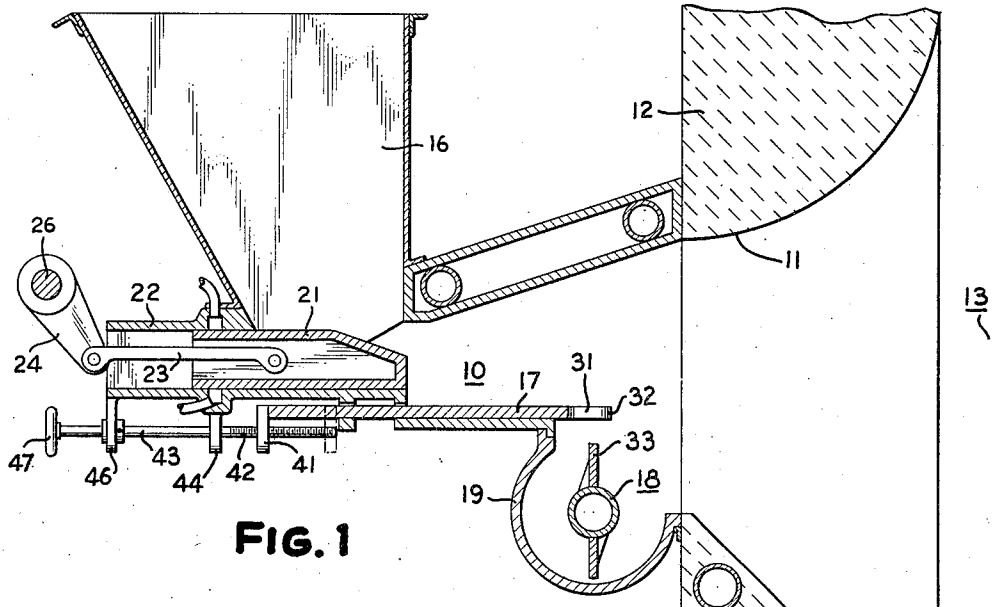



FIG. 1

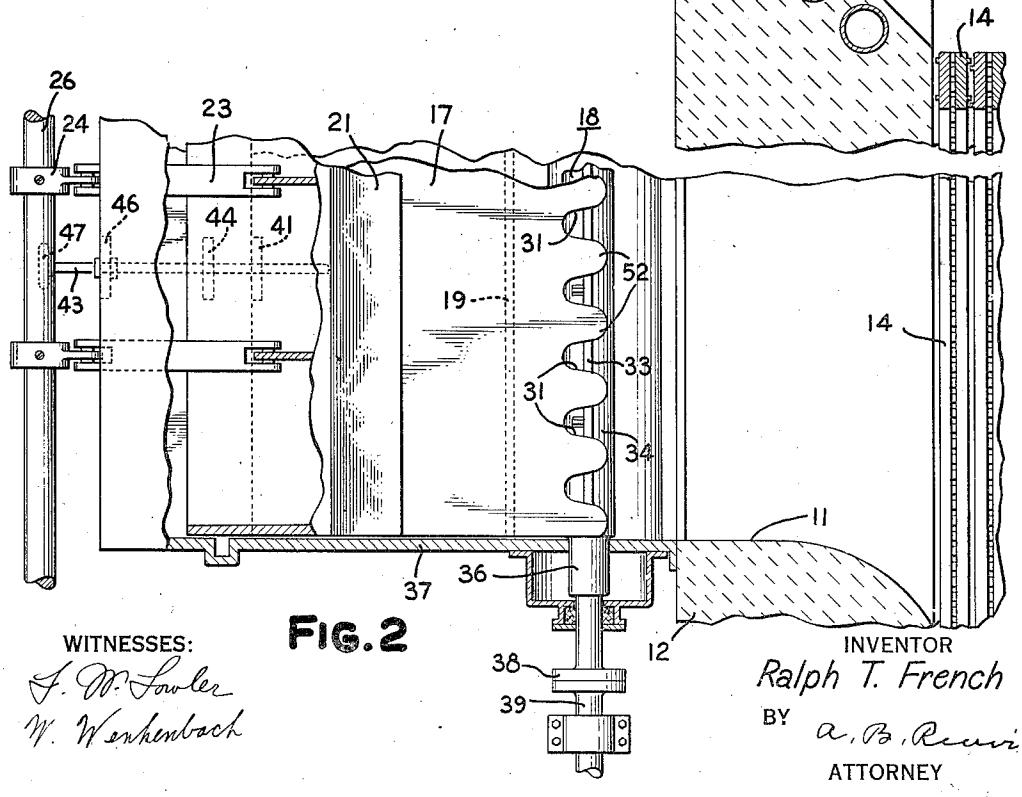



FIG. 2

WITNESSES:

J. W. Fowler

W. Werkenbach

INVENTOR

Ralph T. French

BY A. B. Reavis

ATTORNEY

Dec. 4, 1945. R. T. FRENCH 2,390,062

SPREADER STOKER MECHANISM

Filed June 30, 1943 2 Sheets-Sheet 2

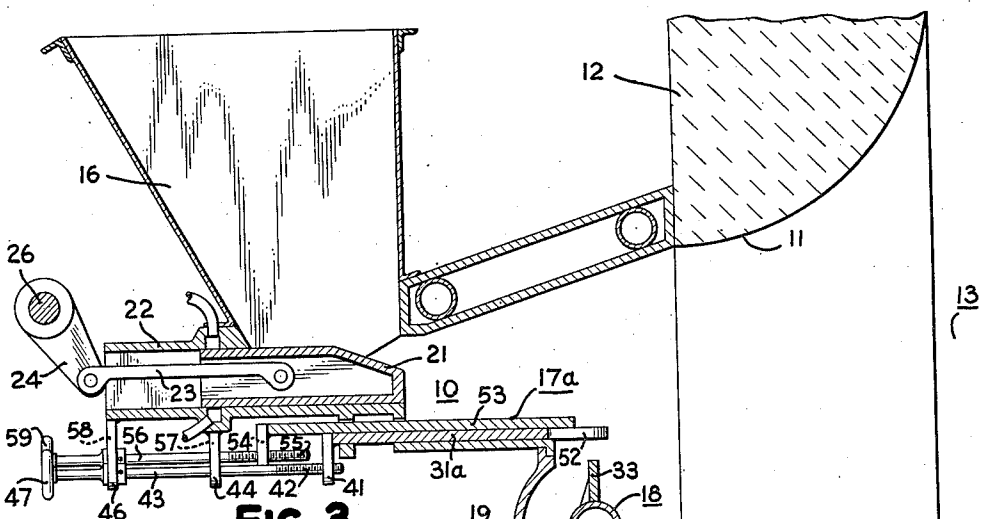



FIG. 3

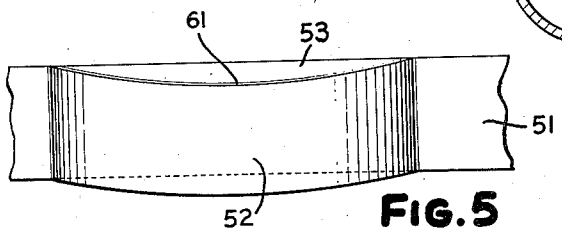



FIG. 5

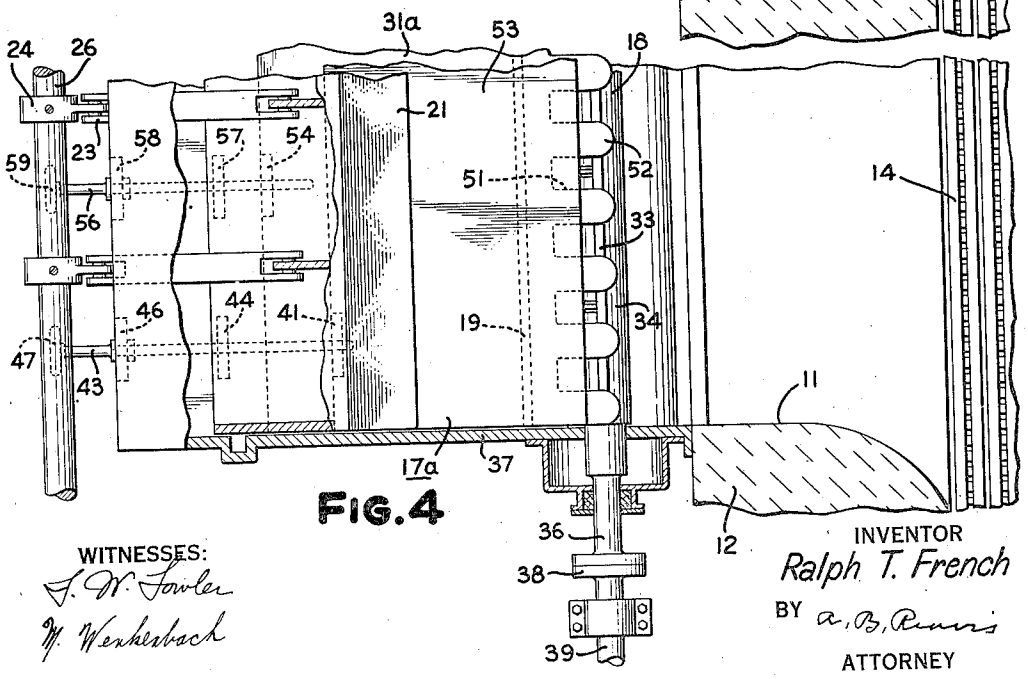



FIG. 4

WITNESSES:

J. W. Fowler

W. Wenkenbach

INVENTOR

Ralph T. French

BY A. B. Rumis

ATTORNEY

Patented Dec. 4, 1945

2,390,062

# UNITED STATES PATENT OFFICE

2,390,062

## SPREADER STOKER MECHANISM

Ralph T. French, Upper Darby, Pa., assignor to Westinghouse Electric Corporation, East Pittsburgh, Pa., a corporation of Pennsylvania

Application June 30, 1943, Serial No. 492,833

5 Claims. (Cl. 110—115)

This invention relates to stokers, more particularly to those "spreader" or "sprinkler" type, and has for an object the provision of novel fuel spreading mechanism of this character.

Another object of the invention is to provide fuel spreading mechanism adapted to secure more uniform distribution of fuel from front to rear of the grate surface.

Yet another object of the invention is to provide spreader mechanism capable of delivering fuel through a multiplicity of trajectories, whereby improved longitudinal distribution of fuel on the grate surface is secured.

A further object of the invention is to provide, in spreader stoker mechanism, a spill plate whose rear discharge edge is so shaped as to provide for delivery of fuel to an over-feed rotary impeller positioned therebeneath, through a zone of considerable longitudinal extent, whereby fuel trajectories having a relatively wide range are provided.

Yet another object of the invention is to provide, in spreader stoker mechanism, a spill plate having a serrated or undulatory rear delivery edge providing for discharge of fuel therefrom in a plurality of longitudinally-spaced vertical planes.

Another object of the invention is to provide, in spreader stoker apparatus, a spill plate having a serrated or undulatory rear discharge edge, together with means for varying the depth of the serrations or undulations.

These and other objects are effected by the invention as will be apparent from the following description and claims taken in accordance with the accompanying drawings, forming a part of this application, in which:

Fig. 1 is a longitudinal sectional view through spreader stoker apparatus embodying the principles of the present invention;

Fig. 2 is a fragmentary plan view of the apparatus illustrated in Fig. 1, with portions thereof broken away for the sake of clearness;

Fig. 3 is a sectional view similar to Fig. 1, but illustrating a modification of the invention;

Fig. 4 is a fragmentary plan view of a portion of the apparatus illustrated in Fig. 3, with portions thereof broken away for the sake of clearness; and,

Fig. 5 is an enlarged detail view of a further modification.

Referring now to the drawings more in detail, the reference character 10 indicates, in its entirety, spreader mechanism for delivering fuel rearwardly through the opening 11 in the front wall 12 of the furnace 13, to the grate structure 14 therein. The fuel delivery mechanism comprises a hopper 16 from which fuel is moved rearwardly over the spill plate 17, to the rotary impeller 18 housed within the casing 19, by the ram 21 positioned within the ram housing 22. Reciprocatory motion is imparted to the ram 21 by suitable means, such as the link 23 and crank arm 24, the latter being fixedly secured to the oscillating shaft 26, driven by any suitable means, (not shown).

The rear discharge end of the spill plate 17 is provided with a plurality of notches or recesses 31 providing therebetween spaced projections 32, the recesses and projections providing gravitational discharge of fuel therefrom to the blades 33 of the impeller 18 therebelow, through a zone of a length in a front to rear direction equivalent to the depth of the notches or recesses 31.

It will be apparent that fuel falling from the tips of the projections 32, when struck by the blades 33 by the rotary impeller 18, will have a trajectory which is inclined more steeply than the trajectories of fuel falling from the bases of the notches 31. Fuel falling from the sides of the projections 32 at points intermediate the tips of the projections and the bases of the notches, will have trajectories intermediate the two limits mentioned.

The impeller 18 comprises a body member 34 carrying one or more blades 33, and being rotatably mounted on a shaft 36, supported by the side walls 37 of the impeller casing 19. The shaft 36 is connected through the clutch or coupling 38 with the shaft 39 of any suitable driving means (not shown).

In order to vary the longitudinal disposition of the zone of fuel delivery with respect to the longitudinal axis or rotation of the impeller, in the direction of fuel feed, the spill plate 17 may be adjusted forwardly or rearwardly by means of the lug 41, depending from the front end of the spill plate, the lug threadedly receiving the threaded portion 42 of the shaft 43, supported for rotation by the brackets 44 and 46, which depend from the dam housing 22. Suitable means, such as the handwheel 47, is provided at the forward end of the shaft 43 for manual rotation thereof to effect adjustment of the spill plate 17.

Referring now to the modification illustrated in Figs. 3 and 4, the spill plate structure 17a comprises a lower plate 31a having notches 51 formed in its rear discharge edge, the notches providing spaced projections 52, over which fuel is adapted to be fed in the manner described

above in connection with Figs. 1 and 2. In the modification of Figs. 3 and 4, means are provided for varying the depth of the notches **51**, thereby correspondingly varying the longitudinal extent of the zone of delivery therefrom. This means for varying the depth of the notches comprises an upper plate **53** overlying the lower plate **31***a* and being adjustable longitudinally relative thereto so that its straight rear edge covers as much as desired of the bases of the notches **51**.

The upper plate **53** may be adjusted longitudinally by any suitable means, illustrated as a depending lug **54** carried by the forward end of the plate **53** and threadedly receiving the threaded portion **55** of the shaft **56**, which is rotatably mounted in the brackets **57** and **58**, depending from the ram housing **22**. Suitable means, such as the handwheel **59**, is provided at the forward end of the shaft **56** for manual rotation of the latter to effect longitudinal adjustment of the upper plate **53**. Inasmuch as the lower plate **31***a* is likewise provided with manual adjusting means, as previously described, both plates may be adjusted, not only with respect to each other, but also with respect to the axis of rotation of the impeller **18**.

In Fig. 5 there is illustrated a modified construction, wherein the projections **52** are provided with concaved upper surfaces **61** for the purpose of aiding in retention of fuel thereon during movement of the fuel rearwardly along the projections. Obviously this construction can be used with either of previously described modifications.

While the invention has been shown in several forms, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various other changes and modifications without departing from the spirit thereof, and it is desired, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What is claimed is:

1. In a stoker, fuel-feeding mechanism comprising a hopper; an overfeed impeller adapted to rotate about a horizontal axis; a spill plate positioned with its rear discharge edge overlying the impeller and parallel to the axis of rotation thereof; means for moving fuel from the hopper rearwardly over the spill plate to the impeller, the rear discharge edge of the spill plate being transversely corrugated to provide a zone of discharge therefrom to the impeller which zone extends in a front to rear direction a distance equal to the depth of the corrugations, and means for adjusting the position of the spill plate rear discharge edge forwardly and rearwardly with respect to the axis of rotation of the impeller, whereby the zone of fuel delivery to the impeller may be correspondingly varied.

2. Structure as specified in claim 1, including means for varying the effective depth of the corrugations.

3. In a stoker, fuel-feeding mechanism comprising an overfeed impeller adapted to rotate about a horizontal axis; spill plate structure positioned with its rear discharge end overlying the impeller; and means for moving fuel rearwardly over the spill plate structure to the impeller, said spill plate structure comprising a lower plate having a serrated rear discharge edge, an upper plate overlying the lower plate and having a straight rear discharge edge, and means for adjusting the upper and lower plates relative to each other longitudinally to expose varying amounts of the serrations of the lower plate.

4. Structure as specified in claim 3, including means for varying the front-to-rear location of the spill plate structure relative to the axis of rotation of the impeller.

5. In a stoker, fuel-feeding mechanism comprising a hopper; an overfeed impeller adapted to rotate about a horizontal axis; a spill plate positioned with its rear discharge edge overlying the impeller and parallel to the axis of rotation thereof; and means for moving fuel from the hopper rearwardly over the spill plate to the impeller, the rear discharge edge of the spill plate being transversely corrugated to provide a zone of discharge therefrom to the impeller which zone extends in a front to rear direction a distance equal to the depth of the corrugations, the fuel-supporting surfaces of the projections of the corrugations being concaved transversely to decrease lateral discharge of fuel therefrom.

RALPH T. FRENCH.