A. S. MANN.

FEEDING MIXED FUELS TO FURNACES.

APPLICATION FILED OCT. 5, 1907.

952,266. Patented Mar. 15, 1910.

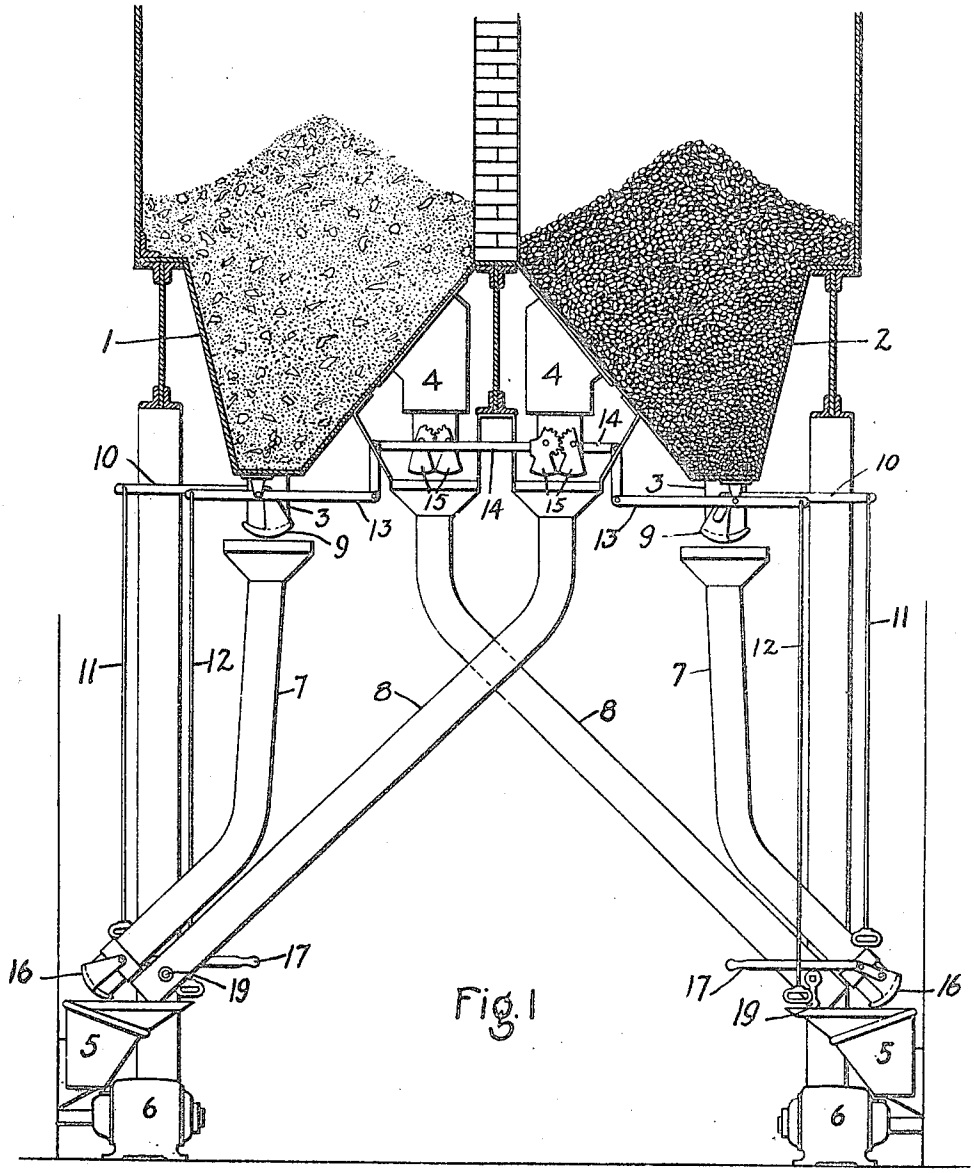


Fig. 1

Fig. 2

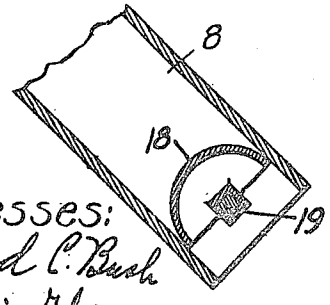
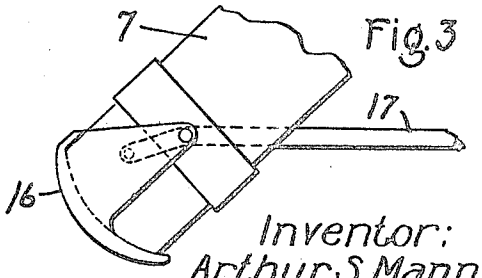


Fig. 3



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UNITED STATES PATENT OFFICE.

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FEEDING MIXED FUELS TO FURNACES.

952,266. Specification of Letters Patent. Patented Mar. 15, 1910.

Application filed October 5, 1907. Serial No. 395,989.

To all whom it may concern:

Be it known that I, ARTHUR S. MANN, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Feeding Mixed Fuels to Furnaces, of which the following is a specification.

This invention relates to devices for feeding fuel to furnaces, and it is especially applicable to the furnaces of steam boilers in power stations.

It is highly desirable to be able, when necessary, to increase the steaming capacity of a boiler for an hour or so in order to meet an increase of load. This can be accomplished by feeding the fire with fuel of a higher calorific value. On the other hand, it is an advantage to be able to use lower grade and, therefore, cheaper fuel during those portions of the day in which the load is moderate. So, too, in case a fire tends to clinker, it is advantageous to be able to change the fuel in order to correct this tendency. By careful management a very great saving can be effected at the coal pile, and a more satisfactory operation of the plant secured.

It is the object of my invention to accomplish these desirable results, and to this end the invention consists in a novel arrangement of coal bins and feeding chutes whereby, for example, high grade bituminous coal and a cheaper grade of hard coal of lower calorific value can be fed to a boiler furnace in varying proportions at the will of the fireman. The two or more kinds of coal are kept in separate bins and are not mixed until just before they enter the furnace; or they may even be mixed after entering, if desired. By keeping the two or more fuels in separate bins, I am able to unload cars into the bins as soon as they arrive at the station, and thus avoid demurrage charges. If the mixing was done in the bins, cars might have to be held until enough coal of each kind was on hand to fill a bin with the proper mixture. This would involve considerable expense in demurrage fees, and would, moreover, require the same proportions of the two or more coals to be fed always, irrespective of the varying demands upon the boiler. My arrangement gives a far greater flexibility of control.

In the accompanying drawing, Figure 1 is a diagrammatic representation of two coal bins with their chutes arranged to feed two banks of boilers; Figs. 2 and 3 show the valves or cut-offs for controlling the chutes.

In the upper part of the boiler house are located the bins 1, 2 containing respectively the two kinds of fuel, say soft coal in bin 1 and hard coal in bin 2. If more than two kinds of coal are used there will of course be an additional bin for each additional grade or kind of fuel. Each bin has one or more delivery spouts depending on the number of furnaces it is to feed. If the bins are arranged, as shown in the drawing, between two banks of boilers, then each bin will have two spouts. Let us for the sake of simplicity consider the case of only one boiler or bank of boilers. The spout 3 on the bin 1 and the spout 4 on the bin 2 are arranged to deliver coal to a mixing hopper 5 which feeds a mechanical stoker operated by power, say by the electric motor 6. I prefer to arrange the spouts to deliver into the upper ends of chutes 7, 8 respectively, which terminate just above the hopper 5. The spout 3 is controlled by a cut-off 9 which can be operated by suitable means, such as a lever 10, and a pull-rod 11 depending to a point near the hopper. By means of other operating devices, such as a pull-rod 12, lever 13 and link 14, the cut-off 15 controlling the spout 4 on the bin 2 can be opened and closed. On opening the cut-off 9 the chute 7 will be filled with coal from bin 1 and on opening the cut-off 15 the chute 8 will be filled with coal from bin 2. At the lower end of the chute 7 is a cut-off 16 controlled by a handle 17, and the chute 8 has a cut-off 18 controlled by a handle 19. The drawing shows the cut-off 16 as a curved shutter closing over the end of the chute 7, and the cut-off 18 as a semi-circular damper inside the chute 8; but these specific forms are merely illustrative. By manipulating the handles 17, 19 the fireman can fill the hopper as often as he sees that it has become empty, using as much of each kind of coal as the varying conditions of service may require. At longer intervals he will fill the emptied chutes by using the pull-rods 11, 12, and by keeping record of the chutefuls used, a convenient measure of fuel consumption is afforded.

When two banks of boilers are used, the spouts, chutes, cut-offs and other parts are

duplicated, as shown in Fig. 1, the operation of each set being quite independent of the other.

What I claim as new and desire to secure by Letters Patent of the United States, is,—

1. The combination with a furnace having a mixing hopper and automatic stoker, of a plurality of coal storage bins situated above the furnace and each provided with an independent spout, chutes leading from the respective spouts to said mixing hopper, and means for controlling the delivery of coal to said chutes and from said chutes to said hopper.

2. The combination with a furnace having a mixing hopper and automatic stoker, of a plurality of coal bins supported above said furnace and each provided with an independent spout, cut-off means for each spout, chutes leading from the respective spouts to said mixing hopper, and independent cut-offs located at the lower ends of said chutes.

In witness whereof, I have hereunto set my hand this 4th day of October, 1907.

ARTHUR S. MANN.

Witnesses:
BENJAMIN B. HULL,
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