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J. HEIN

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FUEL CHARGING APPARATUS

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Fig. 1

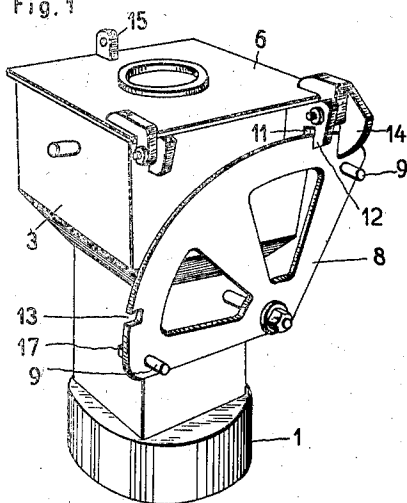


Fig. 2

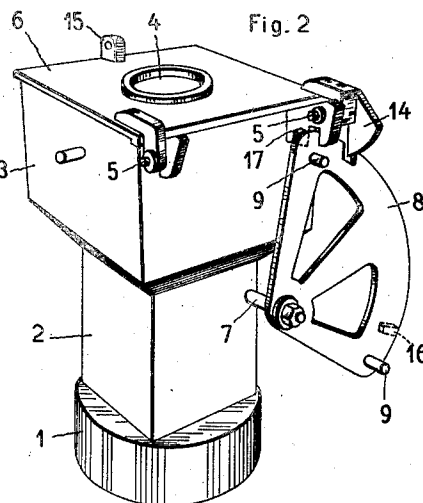


Fig. 4

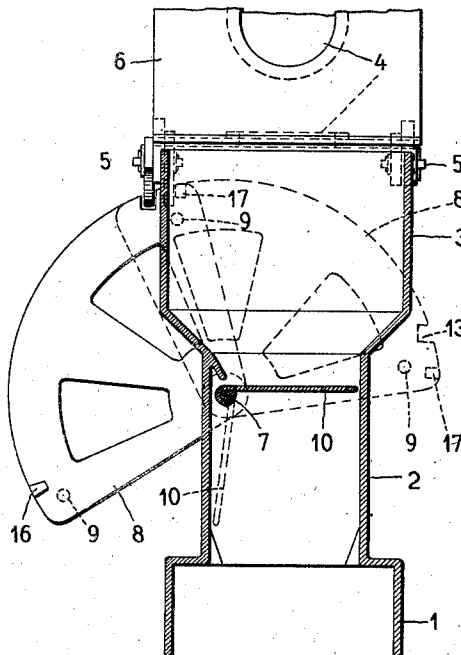
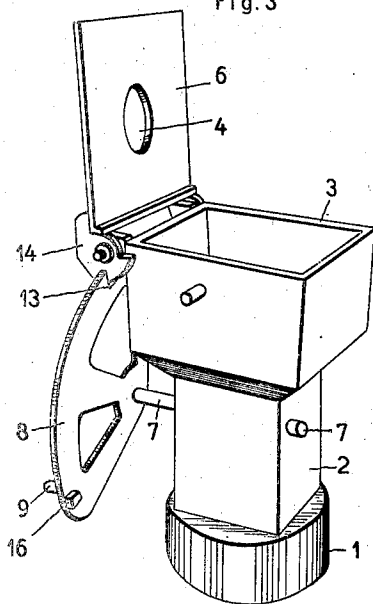


Fig. 3



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FUEL-CHARGING APPARATUS

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5 Claims. (Cl. 214—35)

The usual manual feeding of fuel in brick-kilns, especially circular kilns, to be performed in intervals of about 15–20 minutes has the great disadvantage, that at each lifting of the bell-shaped coverings closing the feeding openings of the kiln a great deal of cold air is admitted due to the draft of the chimney impeding not only considerably the advance of the fire and increasing uneconomically the use of fuel, but also frequently unfavorably affecting the quality of the product to be made. This undesirable admission of cold air from the atmosphere is very considerable, because at each feeding period about 40 feeding holes must be uncovered for feeding the fuel. As the charging of each opening requires about 6 seconds, at 40 feeding holes with a diameter of 150 mm., cold air would enter the kiln for about 4 minutes, and this is a considerable time, since the draft of the chimney (about 15 mm. water column) exerts a strong sucking action.

For this reason the method has been adopted to charge the kiln by way of the feeding holes automatically with the aid of mechanically operated feeding devices arranged above the feeding holes. But these devices charging the fire in predetermined intervals with fuel have, however, apart from their relatively high purchase costs, the disadvantage that at failure of the motor or of the net interruption will occur of the entire fuel feeding process and that individual feeding, making allowance for the different combustion values of the fuel is not possible, as this is the case in the manual feeding where the charging is always governed by prior inspection of the fire.

Manual feeding as heretofore practiced has the disadvantage of admitting cold air to the kiln. This disadvantage is effectively avoided by the invention by making use of a suitable designed charging device for the feeding holes.

For this purpose according to the invention the apparatus is provided below the tiltable lid, having an inspection window, with a rotatory flap coupled with a catch keeping the lid in the closed position. The flap is coupled with the lid in such a manner that by the closing of the lid it is moved from the horizontal (closing) position into a vertical (opening) position and therefore does not hinder the inspection of the fire through the inspection window in the lid, but when releasing the catch, it will assume a position shutting off the lower part of the apparatus from the upper part of the latter and making the fire invisible thereby. Therefore at the following opening of the lid and charging fuel into the

upper part of the apparatus cold air cannot enter the fire. The catch locking the lid consists preferably of a segment rotatably journaled outside the apparatus and on the shaft of which the flap is secured. The segment guided in a block, attached to the wall of the device, is provided with a notch cooperating with a finger arranged on the lid and normally preventing the opening of the lid in such a manner, that it only corresponds to the position of this finger as soon as the segment has been turned from the locking position into the releasing position and in consequence thereof the flap has been brought in the closed position subdividing the apparatus and preventing the entrance of cold air to the fire. The lid may then be lifted easily and conveniently into its open position whereby its finger passes through the notch in the segment. Since during the lifting of the lid the segment is prevented from rotation by the finger having entered the notch, the flap also remains, when the lid is opened, in its horizontal, closing position, so that when feeding fuel into the upper part of the apparatus, sinking of the flap with premature delivery of fuel and admission of cold air to the fire is not possible. As soon as, however, after the completed charging of the fuel to the device, the lid has been moved into its closed position and the finger on the lid has been moved from its locking position by leaving the notch of the segment, the flap is opened by the action of the weight of the fuel resting upon it, whereby it takes along the segment connected to it and automatically causes the same to return to its locking position.

In the accompanying drawing the Figs. 1–3 show by way of example a charging apparatus for the feeding holes of brick-kilns according to the invention perspective in three different positions, while Fig. 4 is a vertical section through the apparatus.

The charging apparatus consists of an annular base part 1 to be placed above the feeding hole, to which is joined a lower container part 2 of prismatic shape and an upper container part 3 also of prismatic shape, but of greater diameter, which upper container part is closed by a lid 6 pivotally turning around the pins 5 and having an inspection window 4. At the lower container part 2 is attached the rotatable shaft 7 of a segment 8, arranged outside the feeding apparatus, said segment being provided with pins or handles 9 for turning the segment. On that portion of the shaft 7, which lies in the interior of the container part 2, is secured a flap 10 which when the lid is closed is hanging downwards as shown

by dotted lines in Fig. 4. The segment 8 serving for locking the lid in its closed position is guided in the slot 11 of a block 12 arranged at the upper container part 3 and is provided at one end with a tooth-shaped notch 13. The lid 6 carries close to the one trunnion 5 a finger 14 extending in the closed position of the lid beyond the segment 8.

If the segment 8 and the lid 6 are in the position of Fig. 1 the lid having a handle 15 cannot be lifted, since the segment 8 stands in the way of the finger 14 and thus locks the lid 6. As in the closed position of the lid the flap 10 is hanging downwards, the operator may readily observe the progress of the fire and the grade of the combustion of the fuel through the window 4. When the fire is to be re-charged with fuel the segment 8 must first be turned into the position shown in Fig. 2 in which the tooth-shaped notch 13 is in a position opposite the finger 14 of the lid. By this movement the flap 10 will at the same time be swung upwards into the position shown in Fig. 4 with full lines, in which it closes the lower container part 2 against the upper part 3. By this rotation of the segment the lid is released so that the finger 14 of the lid may enter the tooth-shaped notch 13 of the segment 8 and the lid be lifted as shown in Fig. 3. The finger 14 being inserted in the notch 13, in the open state of the lid the segment 8, if the lid is opened, and therefore also the flap 10 having been swung upwards into a horizontal position, are kept in their positions and are prevented from returning to their initial positions. The operator may then charge with fuel the upper container part 3, closed against the lower part by the flap 10, whereby by suitable apportioning of the quantities of the fuel fed to the upper container part 3 the most favourable charge of the fire may be easily obtained. In the open position of the lid 6 and during the feeding of fuel practically no cold air can enter the fire, the lifted flap 10 being closed. After having charged the apparatus with fuel the lid 6 is closed again. As soon as with the closing movement of the lid the finger 14 leaves the notch 13 of the segment 8, the fuel in the container part 3 falls down by its own weight through the feeding hole, whereby the fuel moves not only the flap 10 again into its vertical position indicated by the dotted lines in Fig. 4, but also at the same time returns the segment 8, which is connected to the flap 10, to the initial position of Fig. 1. The segment 8 then re-assumes its position in front of the finger 14 of the lid 6, re-locking the latter. The rotation of the segment 8 is preferably limited by stops 16, 17 attached to it, of which the stop 16, in the locking position of the segment comes in contact with the one side of the block 12, while the other stop 17 abuts in the releasing position of the segment against the other side of the block 12.

The new charging apparatus may not only be used for brick-kilns of any kind, but also, if necessary, for other devices to be charged with fuel or other materials.

What I claim is:

1. In a fuel-charging apparatus for the feeding holes of brick-kilns or the like the combination of a container adapted to be placed over the feeding hole, a flap subdividing the container into two chambers, the upper one of which may be closed or opened at its lower part by said flap, a lid adapted to close the said upper chamber at its upper part with a locking device, con-

sisting of a segment fixed on the shaft of said flap and having a notch co-operating with a finger attached to the lid and movable with the latter in a direction perpendicular to that of the said segment in such a manner, that it prevents the opening of the lid when the flap is not in the closed position.

2. In a fuel-charging apparatus for the feeding holes of brick-kilns or the like the combination of a container adapted to be placed over the feeding hole, a flap subdividing the said container into two chambers, the upper one of which may be closed or opened at its lower part by said flap, a lid adapted to close or open the upper chamber at its upper part, a locking device coupled with said flap consisting of a segment fixed on the shaft of said flap, handles on said segment for operating the segment and the flap, a notch in said segment, a finger attached to the lid and movable with the latter in a direction perpendicular to that of the segment in such a manner that it prevents the opening of the lid when the flap is not in the closed position.

3. In a fuel-charging apparatus for the feeding-holes of brick-kilns or the like the combination of a container adapted to be placed over the feeding-hole, a flap subdividing the container into two chambers, the upper one of which may be closed or opened at its lower part by said flap, a lid adapted to close or open the upper chamber at its upper part, a locking device, consisting of a segment fixed on the shaft of said flap, handles on said segment for operating the said segment and flap, a guiding block for the segment secured to the wall of a container and serving as a guide for the segment during its movement, a notch in said segment and a finger attached to the lid and movable with the latter in a direction perpendicular to that of the segment in such a manner that it prevents the opening of the lid when the flap is not in the closed position.

4. In a fuel-charging apparatus for the feeding-holes of brick-kilns or the like the combination of a container adapted to be placed over the feeding hole, a flap subdividing the container into two chambers, the upper one of which may be closed or opened by said flap, a lid adapted to close or open the upper chamber at its upper part, a locking device consisting of a segment fixed on the shaft of said flap, handles on said segment for operating the same and the flap, a guiding block for the segment secured to the wall of a container and serving as a guide for said segment during its movement, stops on said segment limiting the angular movement of the segment and of the flap by coming into contact with the two sides of said guiding block, a notch in said segment and a finger attached to the lid and movable with the latter in a direction perpendicular to that of the segment in such a manner, that it prevents the opening of the lid when the flap is not in its closed position.

5. In a fuel-charging apparatus for the feeding-holes of brick-kilns or the like the combination of a container adapted to be placed over the feeding hole, a flap subdividing the container into two chambers, the upper one of which may be closed or opened by said flap, a lid adapted to close or open the upper chamber at its upper part, an inspection window in said lid for the observation of the fire, a locking device, consisting of a segment fixed on the shaft of said flap, handles on said segment for operating the

5 same and the flap, a guiding block for the segment secured to a wall of said container and serving as a guide for the segment during its movement, stops on said segment limiting the angular movement of the segment and of the flap by coming into contact with the two sides of said guiding block, a notch in said segment

and a finger attached to the lid and movable with the latter in a direction perpendicular to that of the segment in such a manner, that it prevents the opening of the lid when the flap is not in the closed position.

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