W. E. MOORE.

FURNACE CHARGING DEVICE.

APPLICATION FILED SEPT. 13, 1918.

1,343,465.

Patented June 15, 1920.

2 SHEETS—SHEET 1.

Fig. 1.

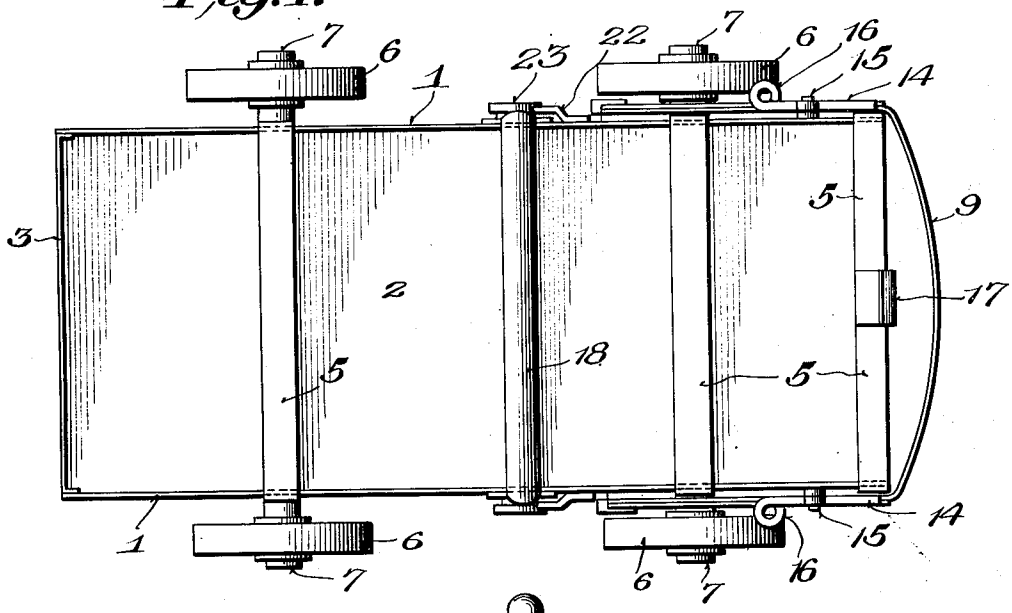
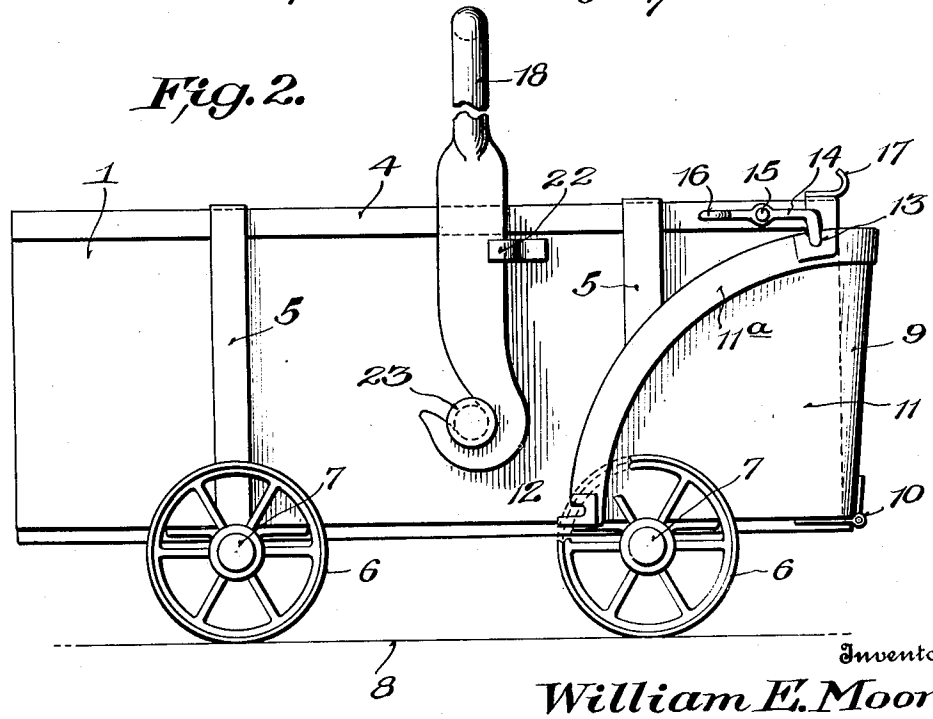



Fig. 2.




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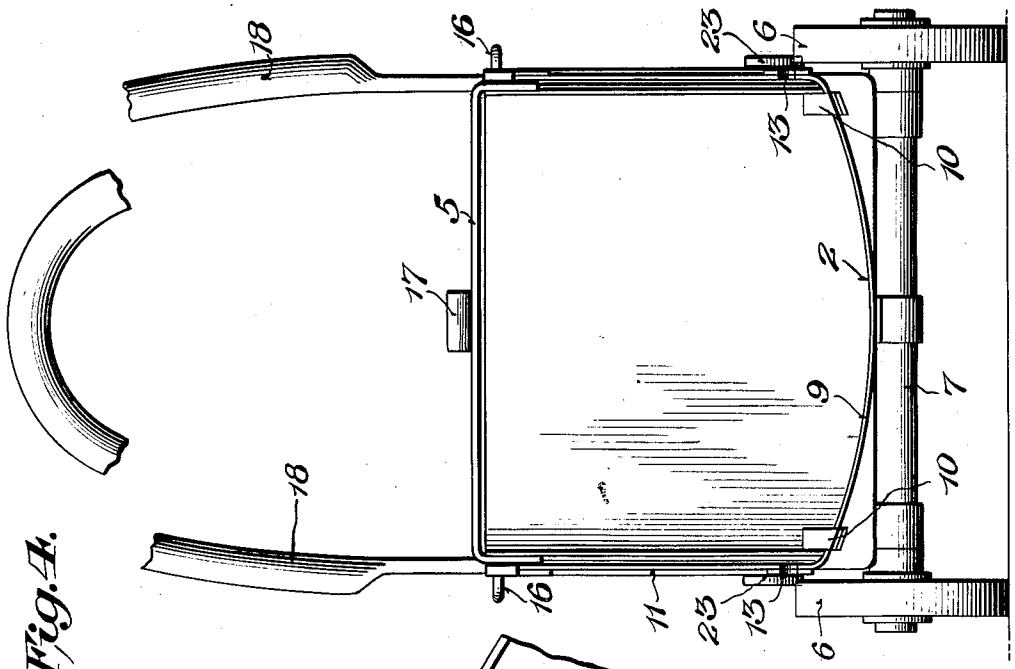


Fig. 4.

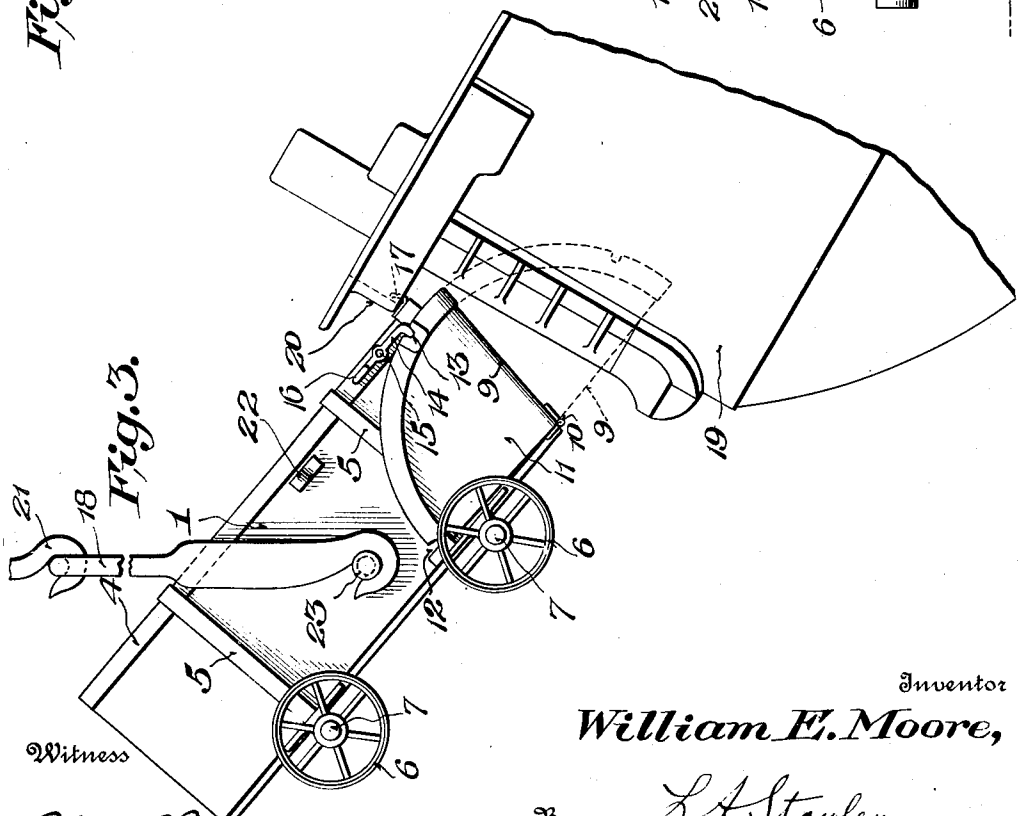


Fig. 3.

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# UNITED STATES PATENT OFFICE.

WILLIAM E. MOORE, OF PITTSBURGH, PENNSYLVANIA.

## FURNACE-CHARGING DEVICE.

1,343,465. Specification of Letters Patent. Patented June 15, 1920.

Application filed September 13, 1918. Serial No. 253,912.

*To all whom it may concern:*

Be it known that I, WILLIAM E. MOORE, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Furnace-Charging Devices, of which the following is a specification.

My invention relates to improvements in furnace charging devices, and it consists in the combinations, constructions and arrangements herein described and claimed.

An object of my invention is to provide a charging device comprising a charging box or carriage adapted to run or be conveyed from the scrap yard to the furnace, together with means for lifting the box and for tilting the same to cause the discharge of the contents of the car into the furnace.

A further object of my invention is to provide a device of the type described in which the box is provided with a curved end portion which is normally locked in position when the box is on the track, but which may be unlocked so as to drop down into an inclined position so as to form a chute over the door sill of the furnace.

A further object of my invention is to provide a furnace charging means which will materially reduce the time taken in charging the furnace and yet which is capable of distributing the charge to the best possible advantage within the furnace to which end the furnace is arranged to be tilted.

Other objects and advantages will appear in the following specification, and the novel features of the invention will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings, forming part of this application, in which—

Figure 1 is a plan view of the box;

Fig. 2 is a side view thereof;

Fig. 3 is a view showing a portion of the furnace with the box in its dumping position; and

Fig. 4 is a front view of the box.

In carrying out my invention I provide a box of the shape shown in the drawing. The body portion has sides 1 preferably made of steel plate with a bottom 2 and a closed end 3. Steel reinforcing straps 4 and 5 are provided at the top and at the sides of the body respectively, the straps 5 extending across the top from side to side, as shown in the drawing. As will be seen from Fig. 4 the bottom is preferably made on a curve to facilitate the discharge of the scrap, or other material, over the concave door sill of the furnace.

The box is supported on wheels 6 carried by axles 7 rigidly secured to the body portion. The wheels are designed to run on surface 8 which may extend from the scrap heap or scrap yard to the furnace. The box may also be transported on an independent truck or car.

The front end of the box is bowed or curved outwardly as shown at 9 to conform with the curvature of the sill 19. The front 9 is secured to the body portion by means of hinges 10 and is adapted to swing downwardly into alinement with the bottom as shown in Fig. 3. Secured to the front portion 9 are segmental shaped guide members 11 which are provided with reinforcing strips $11^a$ having sockets 12 and 13 respectively. Locking dogs 14, pivoted at 15 are arranged to enter the sockets to hold the members 11 in locked position. Handles 16 are provided for operating the dogs 14. A hook 17 is provided on one of the reinforcing straps 5 while a bail 18 is secured to the sides in the manner shown, this bail being pivotally fastened in position slightly nearer the door end of the box on pivots 23, lugs 22 being provided to limit the movement of the bail.

In Fig. 4 I have shown a portion of a tiltable furnace 19 which is provided with a lintle or projection 20 above the furnace door.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood. The box, as stated before, is transportable from the scrap yard to the furnace by any convenient means. On reaching the furnace a hook 21, carried by an overhead crane of the usual type (not shown) is connected with the bail 18 and the car with its contents is elevated until the hook 17 engages the lintel 20, the furnace being tipped with its door facing upwardly. Further lifting of the box will cause the latter to tilt into the position shown in Fig. 3. The forward end of the box may then be let down by releasing the locking dogs 14 from the locking notch 13 when the weight of the con-

tents of the car will cause the end to swing downwardly into the dotted line position shown in Fig. 3 so as to precipitate the contents of the box into the furnace. As the sides 11 swing downwardly the notch 12 will be automatically engaged by the locking dogs so as to hold the sides in locked position. Owing to the fact that there are no projections on the inside of the box the charge is readily dumped, the forward end 9 forming a continuation of the bottom of the box, operating so as to facilitate the passage of the charge from the box into the furnace over the door sill and door bank.

When the contents of the box have been discharged the box is moved outwardly, and the end 9 may be locked in its normal position by means of the dogs 14. It may be then detached from the hook 21 and run immediately to the scrap yard for another charge. With this means of charging the furnace, the shoveling of the scrap into the furnace by hand is obviated. Since the crane may be moved to lift the box to any position desired and the furnace itself may be tilted, the charge may be distributed from side to side so as to arrange it to the best possible advantage within the furnace.

I am aware that devices have been made heretofore to tilt when resting on stationary abutments on the receiver, but in this particular instance it will be noted that the interior of the box has a smooth surface and the end opens full height and width, there being no projections whatever to prevent the charge from freely sliding out when the car is tilted. It will also be noted that the front end of the car being curved to conform with the bottom, forms virtually a continuation of the bottom and a curved chute which projects into the furnace and which therefore guides the charge into the proper position. Furthermore, the charging of a furnace in the manner indicated involves only the use of the ordinary overhead crane, or similar elevating device, thus dispensing with complicated elevating means. The box being of uniform or expanding section toward the door end offers no chance for the scrap to hang or choke.

I claim:

1. In a furnace charging device, a box having a body portion and being provided with wheels, the bottom of said box being curved and an end portion hinged to the bottom and being bowed outwardly to conform with the curvature of the bottom, said end portion being arranged to swing downwardly into alinement with the bottom to form a continuation thereof and means for holding said hinged end portion in its open and closed position.

2. In a furnace charging device, a box having a body portion and being provided with wheels, the bottom of said body portion being curved, a hinged end portion curved to conform with the curvature of the bottom, inwardly extending side portions secured to said end portion and provided with sockets, a locking dog arranged to enter the sockets for locking the end portion and sides in their normal position to close the end of the car and to lock the sides and end portion in a lower position whereby said sides and end portion are adapted to form a rigid chute.

3. The combination with a furnace having a lintel or abutment, of a box having a hook, means for raising the box to cause the engagement of the hook with the abutment whereby the box is tilted, and a hinged end carried by the box and adapted to swing downwardly to form a chute or extension for the bottom of the box.

4. The combination with a furnace having a lintel or abutment, of a box having a hook, means for raising the box to cause the engagement of the hook with the abutment whereby the box is tilted, a hinged end carried by the box and adapted to swing downwardly to form a chute or extension in the bottom of the box, and means for locking said hinged end in its normal position and also in its extended position with respect to the box bottom.

5. The combination with a furnace having a lintel or abutment above the furnace door, of a wheeled box having a lifting bail, a hinged end portion provided with sides, means for holding the end portion in locked position, said end portion being arranged to swing downwardly to form an extension of the bottom portion and said holding means being adapted to secure the end portion in its extended position, and means carried by the box and arranged to engage the lintel of the furnace for causing the tilting of the box when the box is raised.

6. In a furnace charging device, a box having a smooth interior portion and being provided with a curved bottom, an end portion hinged to said box and being curved to conform with the curvature of the bottom, sides secured to said end portion and arranged to extend on the outside of the box and means for holding the end portion and its attached side members in normal closed position with respect to the box body or in an open extended position with respect thereto.

7. In a furnace charging device, a tilting furnace, an elongated open top charging box of a section suitable for entering the furnace door and a swing-down chutelike end or door on the discharge end of the box, a lifting bail pivotally connected to a box nearer its discharge end, and means for engaging an overhead lintel or holding means so that the box may be tilted to its discharging position by engagement of said means.

8. In a furnace charging device, a charging box arranged for transportation on wheels and a chutelike end arranged to enter the furnace door, the sides and bottom of the box being disposed so as to form unrestricting guide portions toward the door end, the end being detachably held in closed position and opening toward the furnace and a suitable lifting bail with the box pivoted in an unbalanced position on said bail, but with an abutment or stops so arranged that the box may tilt within the bail when the discharge end of the box comes in contact with the furnace door opening, though held horizontally by said stop when lifting.

9. In a furnace charging device, a box having a body portion and being provided with wheels, the bottom of said box being curved and an end portion hinged to the bottom and being bowed outwardly to conform with the curvature of the bottom, said end portion being arranged to swing downwardly into alinement with the bottom to form a continuation thereof, means for holding said hinged end portion in its open and closed position, and said box being of an expanded section toward the hinged end portion.

10. The combination with a tilting furnace having a lintel or abutment, of a box having a hook, means for raising the box to cause the engagement of the hook with the abutment whereby the box is tilted, and a hinged end carried by the box and adapted to swing downwardly to form a chute or extension for the bottom of the box.

In testimony whereof I affix my signature.

WM. E. MOORE.