

No. 775,177.

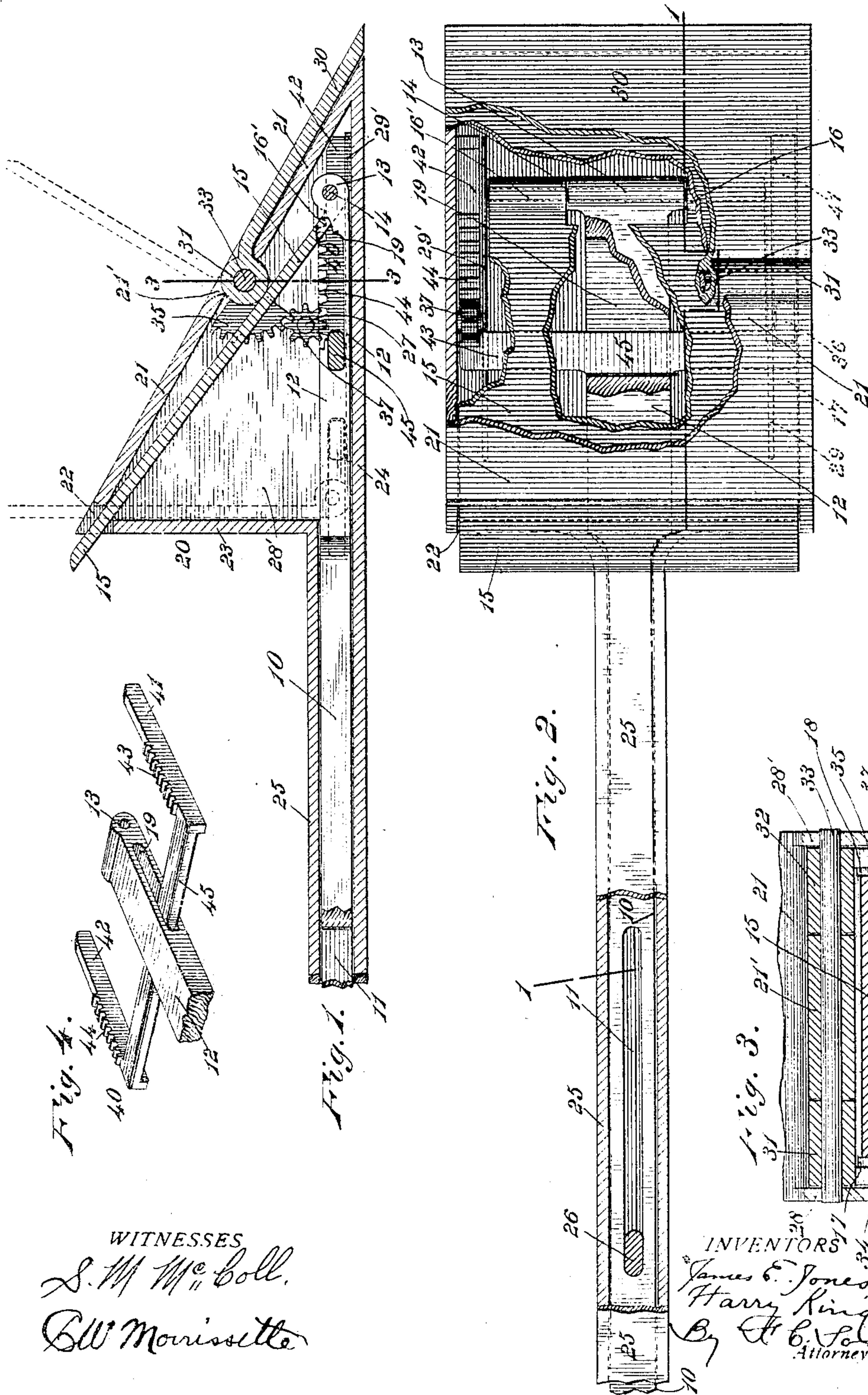
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COKE PULLER.

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NO MODEL.



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# UNITED STATES PATENT OFFICE.

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## COKE-PULLER.

SPECIFICATION forming part of Letters Patent No. 775,177, dated November 15, 1904.

Application filed March 24, 1904. Serial No. 199,742. (No model.)

*To all whom it may concern:*

Be it known that we, JAMES ELLWOOD JONES, residing at Switchback, in the county of McDowell, in the State of West Virginia, and HARRY KING, residing at Washington, District of Columbia, citizens of the United States of America, have invented certain new and useful Improvements in Coke-Pullers, of which the following is a specification.

10 This invention relates to a coke-puller designed to be operated by machine for pulling coke from coke-ovens, and it is particularly adapted for discharging coke from beehive ovens.

15 The invention is herein shown as applied to a coke-puller comprising an underworking scraper operative on its instroke to loosen coke for withdrawal and on its outstroke to withdraw the loosened coke.

20 The object of the invention is to insure the withdrawal of the full depth of coke on the outstroke.

Figure 1 of the accompanying drawings represents a longitudinal section on line 1 1 of Fig. 2 of one embodiment of the invention. Fig. 2 represents a plan thereof, parts being broken out. Fig. 3 represents a transverse section on line 3 3 of Fig. 1. Fig. 4 represents a perspective view of the actuating device for the coke-holders.

The same reference-numbers indicate corresponding parts in all the figures.

This coke-puller is designed to be mounted on a machine adapted to thrust it into and retract it from the oven and swing it laterally in either direction to enable it to engage the coke at the sides of the oven. The machine shown in the expired United States Patent No. 446,936 may be used for this purpose. 40 The coke-puller comprises an actuating-bar 10, which is preferably rigid throughout and designed to be provided along its inner portion with rack-teeth or a rack-bar (not shown) corresponding to the rack-bar *a'* of said patent. This bar is provided with a longitudinal slot 11 and in its front portion 12 with a longitudinal slot 19 and at its front end with a pintle-socket 13, having a pintle 14 fixed therein. A scraper 20 is disposed at the outer

end of the bar 10 and in the form shown is adapted to slide thereon. This scraper is hollow and of wedge-like form and comprises a bottom plate 24 of a breadth equal to the desired width of the scraper, an inclined top plate 21, which extends upwardly and rearwardly from the front edge of the bottom plate, and a back plate 23, which connects the inner edges of the bottom and top plates and constitutes the thick side of the wedge-like body. The top plate 21 and the back plate 23 are recessed at their upper edges, whereby a transverse slot 22 is formed at the upper rear corner of the scraper. The top plate is also provided with a transverse slot 21', and a transverse pintle-rod 33 extends across the scraper along the slot. The scraper is provided with a hollow shank 25, having a cross-bar 26.

The scraper when constructed as shown is provided with two adjustable coke-holders for holding the coke on the outstroke, one of which may be disposed within or substantially within the scraper and the other may be disposed substantially without the scraper. The interior coke-holder is shown in the form of a plate 15, connected at one end with the bar 10 and engaging the slot 22. The front portion 12 of the bar 10 extends through the hollow shank 25 of the scraper into the body thereof, and the connection of the plate to the bar is preferably effected by means of a hinge, which may comprise a pintle-socket 13 at the front end of the bar, pintle-sockets 16 and 16' on opposite sides of said plate, and a pintle-rod 14, extending through said sockets. The other adjustable coke-holder, 30, may be in the form of a swinging plate having pintle-sockets 31 and 32 on the transverse rod 33, disposed opposite the central slot in the top plate 21. This plate in normal position lies over the outer face of said top plate, below the central slot therein. The front end of this swinging plate is preferably beveled to coincide with the bottom of the scraper.

Any suitable means may be employed for shifting the positions of the coke-holders. The means shown include the same actuating-bar for both coke-holders, and in this



particular showing this bar also carries the scraper. The coke-holder 15 being connected to the scraper-bar 10 is thrust outward into upright operative position at the beginning of the outward stroke, the weight of the coke behind the scraper or any suitable locking device serving to hold the scraper stationary until the bar has moved back a sufficient distance to adjust the coke-holders in operative position. Then the front end of the slot 11 engages the stud 26, and the scraper is thence moved with the bar.

The means for adjusting the coke-holder 30 into operative position when constructed as shown comprise toothed segments 34 and 35, attached to the sockets 31 and 32 and meshing with the pinions 36 and 37, journaled within the scraper. A rack device 40 slides in the scraper and is engaged by the rod 10. The rack device in the form shown comprises two rack-bars 41 and 42, provided along portions of their lengths, respectively, with rack-teeth 43 and 44, these bars being connected by a cross-bar 45, which passes through the slot 19 in the front portion 12 of said bar 10. The movement of the bar 10 in thrusting outward the coke-holder 15 is greater than the movement necessary for raising the coke-holder 30, and the slot 19 provides lost motion, or, in other words, enables the bar to move outward a given distance before it begins to act upon the coke-puller 30. When the outer end of the slot 19 reaches the bar 45, the rack device is drawn backward, causing the pinions to turn the segments and the plate 30 to swing into operative position. On the inward stroke of the bar 10 the rack device is thrust forward and operates to close the plate 30. The front ends of the bars 41 and 42 may come in contact with the plate 21 and serve as stops for the rack device and prevent strain on the gearing.

In the use of this coke-puller it is preferably mounted on a machine similar to that shown in said patent or an equivalent thereof. The coke-puller is thrust into the oven and retracted therefrom by the machine or by hand, if desired. The drawings show the coke-puller in position for an inward thrust. On the inward stroke the wedge-like scraper moves over the bottom of the oven underneath the caked mass of coke a sufficient distance to make a proper drawing thereof, and it may be of sufficient thickness to lift the coke under which it passes and break and separate said coke, or more or less thereof, from said caked mass. When the motion of the bar 10 is reversed, the said bar is drawn backward, and the scraper remains stationary under the weight of coke behind it until the front end of the slot 11 in said bar engages the cross-bar 26 of the shank of said scraper. During this backward movement of the bar 10 the coke-holder 15 is raised through the slot 22

into vertical or approximately vertical operative position, as indicated by dotted lines in Fig. 1, whereby the scraper is adapted to engage the full depth of the coke for the outstroke. During this backward movement of the bar 10 the coke-holder 30 remains stationary until the front end of the slot 19 comes in contact with the cross-bar 45 of the rack device and operates said device, thereby causing said coke-holder 30 to swing into upward position, whereby the main portion of the coke immediately above the scraper is grasped or held between the two coke-holders. The backward movement of the bar 10 is continued after it becomes locked with the scraper, and the latter is drawn backward while the coke-holders are in open position. The scraper with its holders so adjusted pushes the coke behind it out through the door of the oven. The first few strokes of the coke-puller are preferably in a direct line, it usually requiring two or more drawings to remove the coke throughout the diameter of a coke-oven. After this is done lateral thrusts of the coke-puller are made, first to one side and then to the other, by means of the machine on which the coke-puller is mounted. On the inward stroke of the bar 10 the gearings between it and the coke-holder operate to close the bottom.

The shank of the scraper may be in the form of an elongated bar extending back to the machine or operator and be movable independently of the weight of coke to thrust the coke-puller into operative position.

We claim as our invention—

1. A coke-puller comprising an underworking wedge-like scraper movable over the bottom of a coke-oven, a plurality of coke-holders connected therewith and adjustable after the instroke to enlarge the capacity of the scraper on the outstroke, and means for adjusting said coke-holders.
2. A coke-puller comprising an underworking wedge-like scraper, a scraper-bar with which said scraper is connected, a plurality of coke-holders connected with said scraper and adjustable after the instroke to enlarge the capacity of the scraper on the outstroke, and means operated by the scraper-bar for adjusting said coke-holders.
3. A coke-puller comprising an underworking scraper movable over the bottom of a coke-oven and provided with a plurality of coke-holders adjustable after the instroke for enlarging the capacity of the scraper on the outstroke, an actuating-bar, and mechanisms connecting said coke-holders with said bar, and adapted to come into operative connection therewith in succession.
4. A coke-puller comprising an underworking hollow scraper movable over the bottom of a coke-oven and provided with slots, an interior coke-holder adapted to project through



one of said slots, an exterior swinging coke-holder, and means for thrusting and swinging said coke-holders into operative positions.

5 A coke-puller comprising an underworking hollow scraper movable over the bottom of a coke-oven and provided with slots, an interior coke-holder adapted to project through one of said slots, an exterior swinging coke-holder, and connected mechanism for thrust-  
10 ing and swinging said coke-holders into operative position.

6. A coke-puller comprising an underworking hollow scraper movable over the bottom of a coke-oven and provided with a transverse  
15 slot in its top plate, a coke-holder comprising a swinging plate hinged to said scraper at said slot and provided with a toothed segment, a pinion disposed within said coke-puller, and an actuating-bar provided with a  
20 rack for engaging said pinion to swing said plate into open or closed position.

7. A coke-puller comprising an underworking scraper movable over the bottom of a coke-oven, a coke-holder comprising a plate  
25 hinged to said scraper and provided with toothed segments, pinions journaled in said scraper engaging said segments, a rack device engaging said pinions, and a slotted actuating-bar engaging said rack device for adjusting  
30 said coke-holder in open or closed position.

8. A coke-holder comprising an underworking scraper movable over the bottom of a coke-oven and provided with a hollow shank having a stud, an adjustable coke-holder  
hinged to said scraper and provided with 35 toothed segments, a rack device comprising two rack-bars engaging said segments and connected by a cross-bar, and an actuating-bar provided with a slot engaged by said cross-  
40 bar of the rack device and with a slot engaged by the stud of the scraper-shank.

9. A coke-puller comprising an underworking scraper movable over the bottom of a coke-oven and provided with slots, an adjustable coke-holder disposed within said scraper  
45 and adapted to be thrust into operative position through one of said slots, an adjustable coke-holder hinged to said scraper at the other slot, an actuating-bar to which the sliding coke-holder is pivoted, and gearing connect-  
50 ing said actuating-bar with the swinging coke-holder.

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