No. 863,484. PATENTED AUG. 13, 1907.

E. H. ABRAHAM.

COKE EXTRACTING MACHINE.

APPLICATION FILED NOV. 16, 1906.

2 SHEETS—SHEET 1.

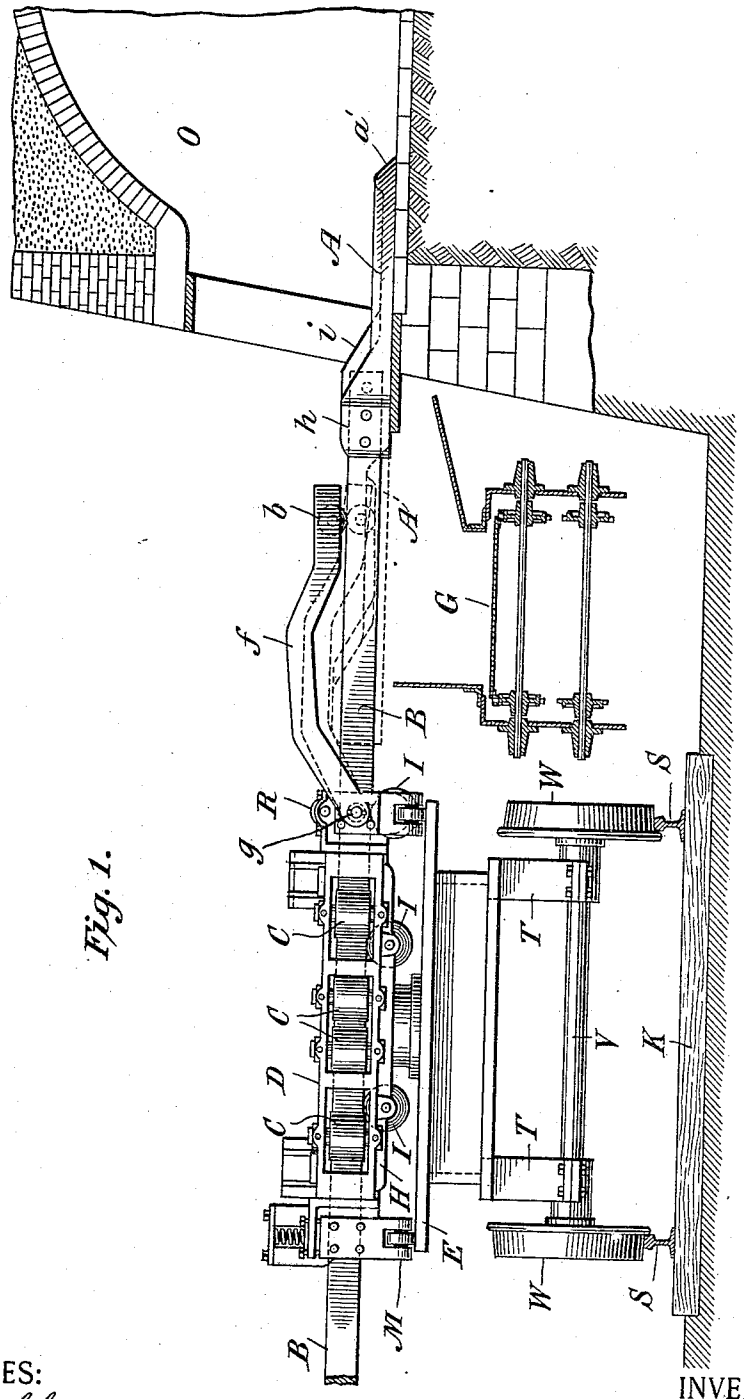


Fig. 1.

WITNESSES:

C. E. Ashley

Charles Engel

INVENTOR

Enoch H. Abraham

By his Attorney,

Millard Parker Butler

No. 863,484. PATENTED AUG. 13, 1907.

E. H. ABRAHAM.

COKE EXTRACTING MACHINE.

APPLICATION FILED NOV. 16, 1906.

2 SHEETS—SHEET 2.

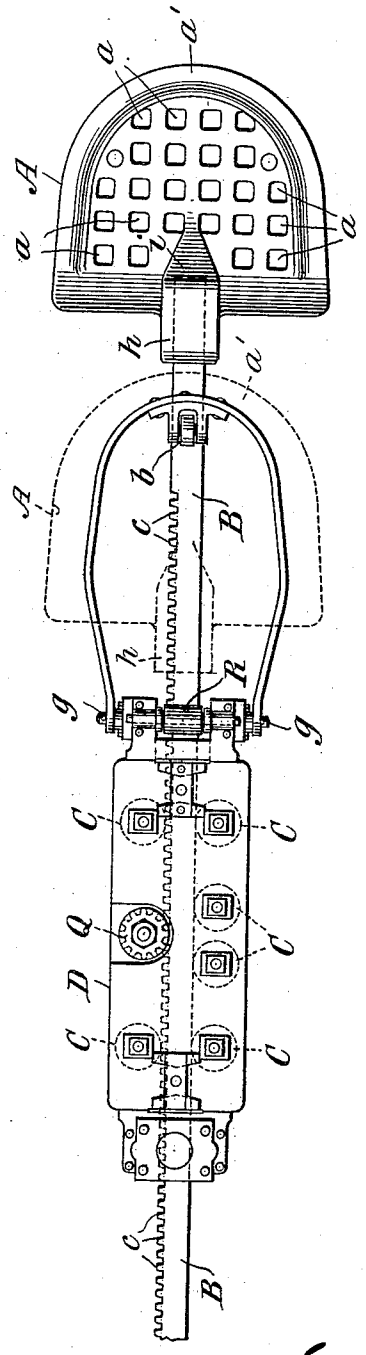


Fig. 2.

WITNESSES:
C. E. Ashley
Charles Engel

INVENTOR
Enoch H. Abraham
By his Attorney,
Millard Parker Bicker

UNITED STATES PATENT OFFICE.

ENOCH H. ABRAHAM, OF UNIONTOWN, PENNSYLVANIA, ASSIGNOR TO COVINGTON MACHINE COMPANY, A CORPORATION OF VIRGINIA

COKE-EXTRACTING MACHINE.

No. 863,484. Specification of Letters Patent. Patented Aug. 13, 1907.

Application filed November 16, 1906. Serial No. 343,651.

To all whom it may concern:

Be it known that ENOCH H. ABRAHAM, a citizen of the United States of America, and a resident of Uniontown, Fayette county, Pennsylvania, has invented new and useful Improvements in Coke-Extracting Machines, of which the following is a specification.

My invention relates to improvements in machinery for the extraction of coke from ovens and more particularly to that class of machinery in which a plate or shovel is forced through the door of the oven and under the coke, and the coke is then withdrawn, either by pushing it out of the door on the opposite side of the oven, or else by drawing it out of the door through which the tool or shovel is inserted, by the withdrawal of the latter.

The invention relates particularly to that class of machinery in which the tool which removes the coke from the oven is carried upon a carriage moving on a track in front of a series of ovens, which carriage is caused by appropriate mechanism to travel in front of the row of ovens and to insert and withdraw the tool into and from each oven and so move it when in the oven, horizontally and vertically, that all parts of the oven in succession will be subjected to its effect.

In this particular class of coke extractor the plate or shovel is attached to a bar or ram, which bar or ram slides in an appropriate carriage, between rollers and is necessarily of such length that the shovel or plate attached to it may reach the most remote parts of the coke ovens. The object of the present invention is to provide a shovel which will draw out more and larger pieces of coke from the furnace at every stroke than has hitherto been possible. I accomplish this by making the flat portion of the shovel which is attached to the bar or ram in the form of a semi-circle and providing it with a sharp edge in the manner hereinafter described, and having openings in the flat portion through which the smaller particles of coal and ashes can fall and also providing mechanism whereby, when the shovel is retracted, the contents thereof will be pushed or scraped off it and caused to fall into another receptacle provided.

The invention will be best understood by reference to the accompanying two sheets of drawings in which

Figure 1 is a vertical end view partly in cross section of a coke extracting machine of the type shown in United States Letters Patent issued to William H. McConnell No. 768,067 on the 22nd day of August 1904, to which the present invention is applied. Fig. 2 is a plan view of the carriage of the McConnell machine showing the retracting bar and the shovel thereto attached.

Similar letters refer to similar parts throughout the several views.

In the drawings, E represents the bed plate of the machine which is made preferably rectangular in form and is of the same general type of bed plate shown in the aforesaid patent. It is mounted on the pedestals T, which in turn are mounted on the wheels W on the axle V.

S represents the rails upon which the extractor moves placed in front of the series of coke ovens upon the ties K.

B is the bar or ram of the coke removing mechanism attached to which, at one end is the scoop or shovel A. The ram B is mounted on a horizontal rotating ram carriage D, as shown in Fig. 1 and in the patent above referred to, and arranged to slide therein between a series of vertical rollers C C which rotate in appropriate boxes inserted in the top of the bottom plate H of the carriage D shown in Fig. 1. The ram is supported underneath by two horizontal rollers I I and is held down by a roller supported in the extension piece at the rear end of the carriage and by the roller R on the front end.

A variety of devices may be used for controlling the movement of and to move the ram, but these play no part in the present invention.

The ram is provided with the tooth rack c, which engages with the spur wheel Q connected with appropriate mechanism for driving the same forward and backward, and the whole carriage turns upon the rollers M on the top of the bed plate E.

The shovel is substantially semi-circular, as shown in the drawings, but it may be of any convenient shape. It is provided with the openings *a* of convenient shape and is beveled at the edge as shown at a^1, so as to make a sharp edge which can pass under the coke. G is a conveyer placed between the carriage and the furnace, upon which coke as it falls from the shovel is discharged. The conveyer is made of any convenient shape and may be a traveling table or bed of any convenient shape.

In order to effect the removal of the coke from the shovel a tilting frame *f* is provided, which is pivoted to the carriage D at the point *g* as shown in Fig. 1. By pivoting the frame to the carriage as shown, allowance is made for any irregularities in the surface of the ram bar or shovel, and a constant distance between the bottom of the scraper and shovel is maintained. This frame is preferably of the same general shape as the shovel, and its outer or loose end rests upon the bar or ram B, upon which it slides easily. To avoid wearing of the bar a roller *b*, attached to a bearing at the extreme end of the frame *f* is shown, and rolling on the upper surface of said bar. The shovel is attached to a head *h*, shown in Figs. 1 and 2, which is provided with a beveled face *i*, so that when the shovel is retracted, the frame which is supported by the roller *b* when it reaches the point *i* on the edge of the head falls upon the shovel and

pushes forward the coke thereon over the edge of the shovel and onto the conveyer. Small particles of coke and ashes are forced out through openings *a a* in the bottom of the shovel.

The method of operation is as follows: The carriage is rolled in front of a coke oven and the operating mechanism is brought into engagement. When the ram B begins to move forward, the shovel is directly under the frame *f* with the roller *b* resting upon the front of the shovel. The mechanism first moves the shovel forward and when it advances to a sufficient point the roller *b* rises on the beveled face *i*, thus leaving the frame *f* clear of the back *h* of the shovel, and allowing the shovel to enter the furnace. Thereupon the turning mechanism is thrown into engagement and the shovel is moved from side to side so as to engage the coke. Part of the coke will pass over the head as the shovel moves into the furnace. When the shovel is retracted, it brings out the coke which has fallen behind it, as well as the coke which is resting on top of it. The latter portion is scraped off by the frame *f* when the shovel nears the end of its return stroke, and falls in the conveyer, which deposits it on the cars. This operation is repeated from time to time as is necessary until substantially all the coke is removed.

I claim as my invention:

1. In a coke extracting machine, the combination with the carriage and the reciprocating ram, of a wide, flat shovel arranged to be introduced under the coke in the furnace, and a scraper attached to the carriage of the machine, whereby when the shovel is retracted the coke is removed from the shovel by the scraper.

2. In a coke extracting machine, the combination with the carriage and reciprocating ram, of a wide, flat shovel provided with a high back arranged to be introduced under the coke in the furnace, and a scraper attached to the carriage of the machine, whereby when the ram is retracted the coke behind the shovel is drawn out by the back of the same, and the coke upon it is pushed off by the scraper.

3. In a coke extracting machine, the combination with the carriage and the reciprocating ram, of a wide, flat shovel provided with openings through which the smaller particles of coke can fall, arranged to be introduced under the coke in the furnace, and a scraper attached to the carriage of the machine, whereby when the shovel is retracted the coke is removed from the shovel by the scraper.

4. In a coke extracting machine, the combination with the carriage and the reciprocating ram, of a wide, flat shovel arranged to be introduced under the coke in the furnace, and a scraper attached to the carriage, composed of a frame conforming in shape to the shape of the shovel, whereby when the shovel is retracted the coke is removed from the shovel by the scraper.

5. In a coke extracting machine, the combination with the carriage and reciprocating ram, of a shovel arranged to be introduced under the coke in the furnace a suitable scraper, pivoted to the carriage and weighted so as to allow for irregularities in the ram bar or shovel and to maintain a constant distance between the bottom of the scraper and the shovel.

6. In a coke extracting machine, the combination with the carriage and reciprocating ram, of a shovel arranged to be introduced under the coke in the furnace a suitable scraper, pivoted to the carriage arranged to slide over the shovel when the latter is retracted and weighted so as to allow for irregularities in the ram bar or shovel and to maintain a constant distance between the bottom of the scraper and the shovel, and provided at one end with a roller for preventing wear of the scraper on the shovel.

7. In a coke extracting machine, the combination with the carriage and reciprocating ram, of a shovel arranged to be introduced under the coke in the furnace a scraper composed of a frame conforming in shape to the shape of the shovel, pivoted to the carriage arranged to slide over the shovel when the latter is retracted and weighted so as to allow for irregularities in the ram bar or shovel and to maintain a constant distance between the bottom of the scraper and the shovel, and provided with a roller at the loose end, for preventing wear of the scraper on the shovel.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two witnesses. this 15th day of November, 1906.

ENOCH H. ABRAHAM.

Witnesses:
WILLARD PARKER BUTLER,
JOHN FRENCH.