No. 628,069. Patented July 4, 1899.

A. E. BROWN.

PIG BREAKING MACHINE.

(Application filed Mar. 30, 1899.)

(No Model.) 3 Sheets—Sheet 1.

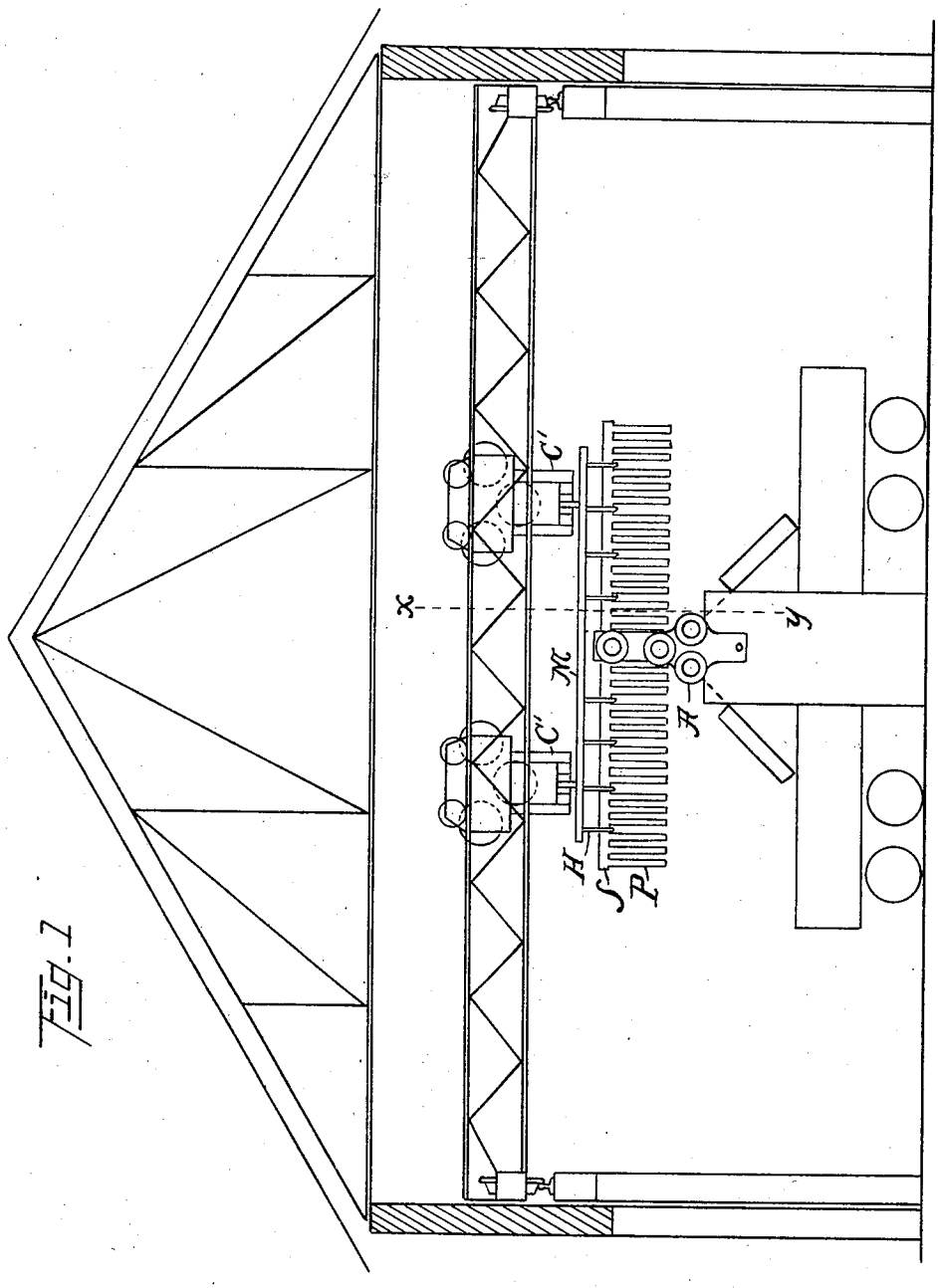


FIG. 1

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3 Sheets—Sheet 2.

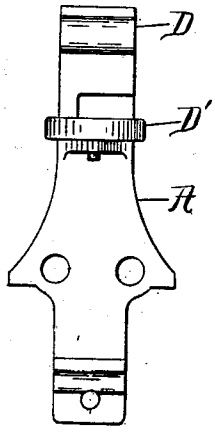


Fig. 5

Fig. 2

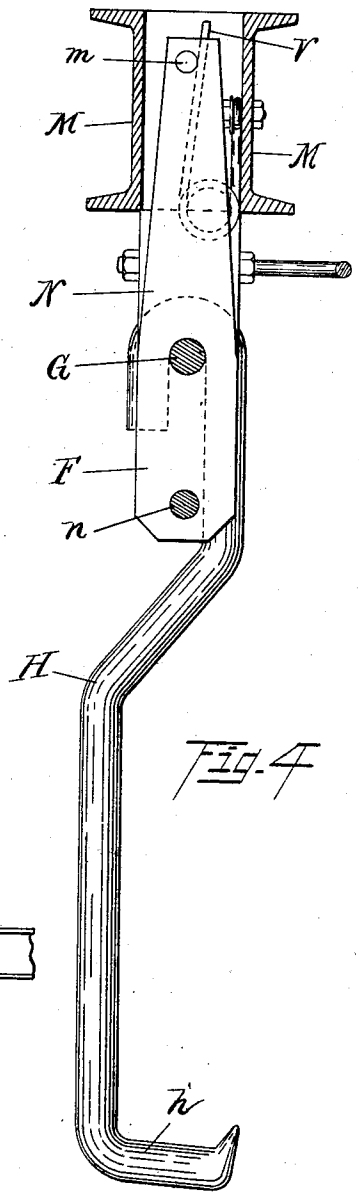


Fig. 4

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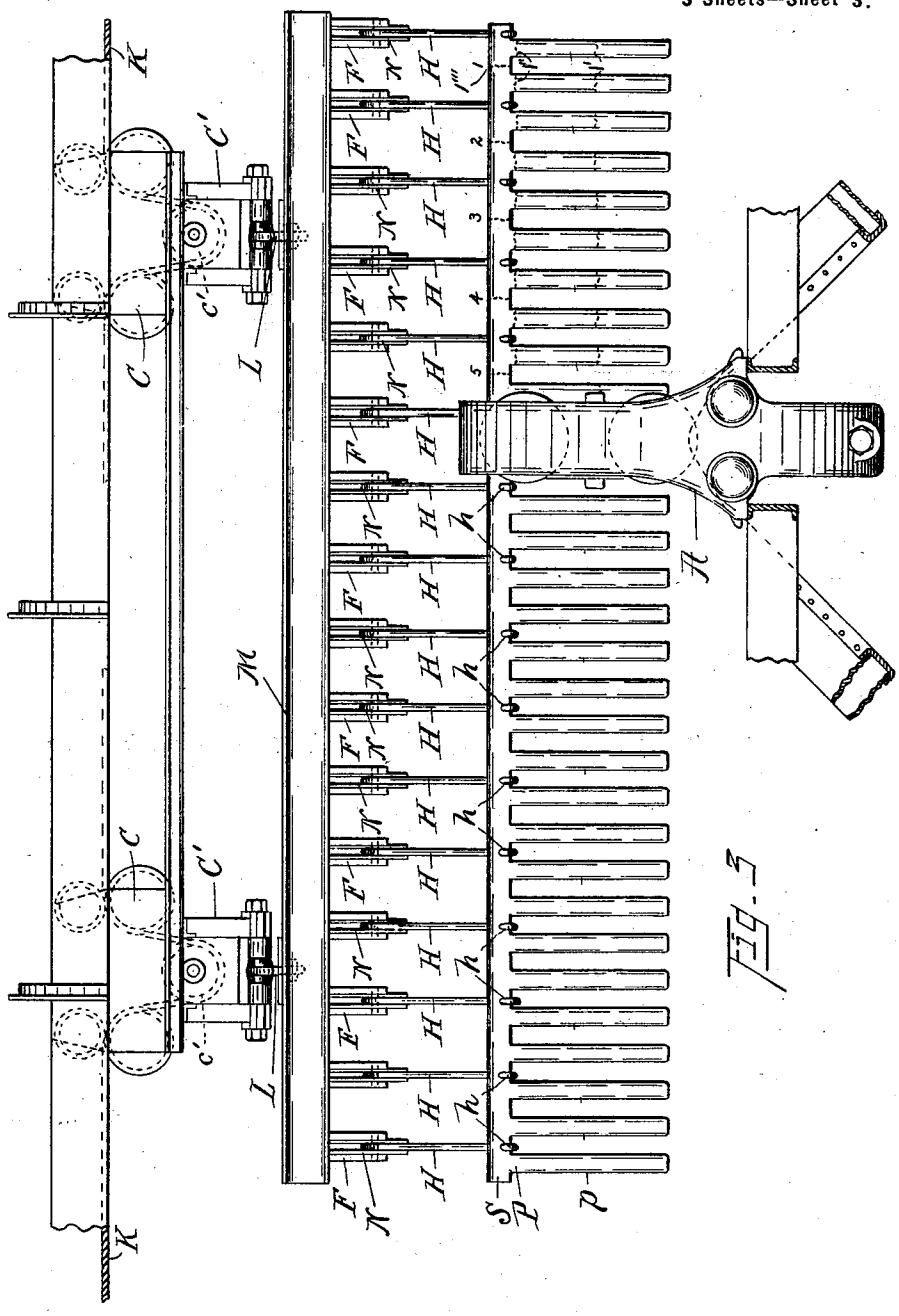


FIG. 3

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UNITED STATES PATENT OFFICE.

ALEXANDER E. BROWN, OF CLEVELAND, OHIO.

PIG-BREAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 628,069, dated July 4, 1899.

Application filed March 30, 1899. Serial No. 711,134. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER E. BROWN, a citizen of the United States, residing in the city of Cleveland, county of Cuyahoga, in the State of Ohio, have invented a new and useful Improvement in Pig-Breaking Apparatus; and I hereby declare the following to be a full, clear, and exact description thereof.

My said improvement belongs to that class or system of pig-bed-breaking apparatus wherein the breaking-machine proper consists of an upright U-shaped housing or frame for hydraulic or other type of plungers adapted to operate against the pig-bed when brought into position for the purpose by overhead carriers; and my invention consists in the construction and combination of parts, hereinafter more fully pointed out and claimed, whereby the pig-beds are grappled and suspended from the carrier in a manner to secure during the process of breaking a simple and uniform bearing for the bed no matter how irregular and variable is its surface, and not only at all the points by which the same is held beneath the carrier, but also against the dies themselves.

In the accompanying drawings like letters denote like parts in every instance.

Figure I is a diagrammatic sketch of a pig-breaking apparatus, showing the pig-bed in position for breaking. Fig. II is an enlarged partial sectional view of a similar apparatus through the line $x\ y$ of Fig. I. Fig. III is a front view of a pig-bed when grappled and swung from the carrier before a breaker, as herein claimed and described by me. Fig. IV is a sectional detailed view of one of the series of hooks shown in Fig. III. Fig. V is a front sketch of the die-field of the said frame or housing, showing the relative distribution therein of the several dies or teeth.

In the several drawings, wherever appearing, A represents a plunger-and-die breaking-machine available for use in the connection under consideration. It consists of two upright steel arms arranged oppositely to each other and containing and serving as a housing in the one for suitable plungers B B′ and in the other for the corresponding dies or teeth D and D′. Said plungers may be operated by any effective power, but in the present case are assumed to be hydraulically controlled. The plungers B B′ are provided with the heads $b\ b'$, of which heads b' is plain-faced, while b is preferably projected, in the manner shown, throughout its lower face, in advance of the upper portion of its face, to gain breaking efficiency when operated in connection with dies located with respect thereto in the special manner I have also shown in the drawings.

Referring to Fig. V, the stationary die D is of tool-steel set in the said frame or housing opposite to the upper portion of the plunger-face b. As indicated in the drawings, this die D is dovetailed into the frame or housing at the point thereof above specified. The lower die D′ is located in said frame at a point midway between the operative fields of the said plungers. It has a contact-face of sufficient dimension to receive two adjacent pigs at the same time thereon, and, unlike the upper die D, D′ is pivoted within its housing, so as to enable it to rock therein and thereby adjust itself to any superficial inequalities of the pig-bed at the several bearing-points of the dies and equalize the several bearings. P is the pig-bed to be broken, which is of the class composed of a sow S and pigs $p\ p\ p$, &c. In the several drawings, C indicates the carrier, which is to feed the pig-bed P to the breaker proper, A, in the interspace between the upright arms of the said frames or housing and the said plungers and dies. Manifestly the said carrier must be of the overhead type; but otherwise it is not material what kind of carrier is employed in the combination. As will be seen, Fig. III, I have preferably made use of two trolleys instead of one, in order to thereby gain greater steadiness in the vertical plane for the load carried. The system of tramways in connection with which the carrier is used in the combination claimed by me is also not an essential element thereof, and any form of carrier that is preferred and that will administer to the needs of a particular cast-house may equally well be used in the said connection.

Referring now more particularly to Figs. III and IV, H H H are a series of hooks having arms or prongs $h\ h\ h$ of suitable proportions to grapple a pig-bed beneath its sow and support the same thereby. Each of said hooks H is curved at its upper extremity to form a

hook or bail, by which it is hung and can swing freely around a pivot G, passing through and supported by two upright and parallel channel-pieces F F. Said pieces F F, on the other hand, are each riveted through the upper portions of their respective flanges to the exterior surfaces of two other channel-beams M M, which are arranged parallel to one another and at right angles to the pieces F F. The series of hooks are coupled, in the above-described manner, to and vertically hung from a single continuous hoisting-beam made up of the two parts or pieces M M so joined together. Said hoisting-beam is connected in any convenient manner with the carrier or carriers by which the pig-bed is brought into the position for breaking when grappled or supported by the series of hooks pertaining to the said hoisting-beam in the manner hereinafter described. A flexible or similar connection, however, between said beam and its supporting carrier or carriers, especially in conjunction with the freely-swinging hooks H H, permits the pig-bed to adjust itself to such a position as will allow the pigs being broken to be brought into solid bearing with the dies, without other portions of the pig-bed being, at such time, in solid contact with the machine, and a fracture of the pigs or sow at any other points than immediately before and against the dies is thus avoided. At the same time such portion of the bed as is not in contact with the dies is enabled to adjust itself without undue horizontal resistance according as the bending and breaking of the pigs in front of the dies require. I have accordingly claimed such a flexible or similar method of connection as an essential element of the more specific forms of the invention and improvement I have herein disclosed. One form of the connection last above referred to is represented in Figs. II and III as by the swivel connection L and the flexible hoisting-cable K, which passes under the sheave c', and thereby supports the frame C', connected with the beam M by the swivels L. I have found it desirable to have such a number of hooks in the entire series pertaining to a given hoisting-beam as will suffice to permit a grapple to be made beneath the sow between each second pig belonging to the same. Journaled upon the pivot G on either side of the upper extremity of the hook H when hung in its said position upon said pivot are two plates, extending above and below the pivot G and united at their tops and bottoms by the respective bolts m n to constitute the hook-lever N. The bolt n in said hook-lever N serves as a stop and bearing for the hook H in its vibration around the pivotal connection G, and the corresponding upper bolt m serves as a stop and bearing for and against the arm of a spring V, which is fastened to one of the horizontal channel-beams M in position to bear under tension upon said bolt m. As will be evident, the office of the above-described spring hook-lever N is to force the hook to which it is applicable to assume a position in advance of the vertical and to thereby insure that whenever by reason of superficial irregularities in a sow the load no longer rests upon the hook in question such hook shall, nevertheless, retain a position to regain a bearing the moment when by the breaking of the sow in some part a readjustment of bearings occurs.

Although in the specification I show a specific form of the hook employed and of its connections to the hoisting-beam, as well as other structural details in respect to the apparatus representing my invention, I by no means intend to limit my invention to these special forms and details. The number of parts also are not material or the precise form and location of plungers, dies, or other features I have disclosed, so far as the same are not made the subject of specific claims herein.

My said invention broadly extends to and covers any form or mechanism for bringing a pig-bed before the breaking device in such manner that the same is presented between the plungers and dies with the pigs in a vertical position and, in the more limited constructions herein shown and claimed, to any form or mechanism which provides for the flexible connection or suspension of said pig-bed referred to or for an automatic arrangement by which each of said hooks or supporting devices assumes a position to regain a bearing upon the load suspended thereby from its carrier when for any reason during the operation of breaking a pig-bed such hook for the time being has lost or has failed to gain a bearing upon the same.

Having now explained my said invention in detail, its mode of operation is manifest. Assume that the breaking-machine used in the combination is located at one end of the cast-house. The carrier to which the said hoisting-beam and its hooks H H are connected may then be located and travel upon an overhead tramway transverse to said house and which is itself adapted to travel, like a crane, upon trusses and tracks extending longitudinally to said house, or the carrier or trolley that is to immediately feed the breaker may travel on a fixed tramway that spans the cast-house transversely above said breaker and is itself fed by another carrier or trolley on a tramway that extends longitudinally above the house to and over the casting-beds. In either or any such arrangement with respect to the carriers employed the said hoisting-beam and the hooks H H may be used either to grapple and carry the pig-bed directly from the place of casting to the position for breaking or it may relieve and supplement some other form of grappling device that is used for picking up the loads and bringing them to the vicinity of the breaker, or pig-beds may be brought in the first instance by any manner preferred beneath or within the predetermined limits

of an overhead carrier and deposited and thereafter be grappled directly by said hooks connected with a carrier mounted on a fixed truss-tramway over the breaker and be carried to their destination. However the pig-bed is brought from the casting-beds when finally delivered upon my said hooks in the manner described the pigs will be brought by the carrier, in combination with which said hooks are to be employed, before the plungers in a vertical position and in such relative position with respect to the plungers and dies, when located as I have shown in the drawings in a particular case, that at one stroke of the plungers B B′ two adjoining pigs will be broken near their middle points *l′ l′* across the lower die or tooth D by the plunger B′ and at their junctures with the sow *l″ l″* across the die D by the stroke of the lower and more projecting portion of the face of the plunger B and the sow itself at the point *l‴* at the same stroke by the upper and less projecting portion of said face as the plunger B finishes out its stroke. As each set of two vertical pigs and their portion of the sow are broken the fragments fall and can be cleared away by gravity-chutes or be otherwise disposed of. The operator then advances the carrier with the remaining and unbroken portion of the bed until two other vertical pigs are in position for breaking, and the same operation is repeated until the entire pig-bed is broken, and the carrier, with its pendent hooks H H, can return and receive a second bed to be disposed of accordingly.

Having thus described my said invention, what I claim as new, and desire to secure by Letters Patent, is the following:

1. The combination with a pig-breaking machine, having horizontal plungers, of an overhead carrier and a series of hooks connected to the same for the purpose of grappling the sow and thereby suspending the pigs thereof vertically from said carrier during the process of breaking the pig-bed, substantially as shown and described.

2. In a pig handling and breaking machine, the combination of a carrier for bringing the pig-bed to the place for breaking the same, and a series of hooks connected to said carrier for the purpose of grappling the sow and supporting the pigs of the same vertically during the breaking thereof, the said hooks being provided with tension-springs, as described, to force them to automatically assume a position in advance of the vertical whenever out of bearing with the load to which they are applied, substantially as shown and described.

3. In a pig handling and breaking apparatus, having one or more plungers for breaking the pig-bed adapted to operate horizontally across a space or passage extending openly above, the combination of an overhead carrier and suitable hooks or supporting devices connected therewith whereby the pig-bed may be vertically suspended from said carrier and, in such position, brought into said space or passage before said plungers, substantially as shown and described.

4. The combination with a pig-breaking machine, having horizontal plungers, an overhead carrier adapted to bring the pig-bed in front of said plungers, and means for suspending the same from said carrier with the pigs thereof vertical, when brought thereby in front of said plungers, substantially as shown and described.

5. The combination of a pig handling and breaking machine, having horizontal plungers, an overhead carrier and suitable means for suspending the pig-bed from the said carrier with the pigs thereof extending downwardly, which said means permit the pig-bed, at the same time, to be swung around or beyond the vertical axis or plane with respect to said carrier, substantially as shown and described.

6. The combination of a pig handling and breaking machine, having horizontal plungers, an overhead carrier having a series of sustaining-hooks, as described, and suitable means for connecting said series to said carrier, which said means, at the same time, permit said series and the load sustained thereby to be swung around or beyond the vertical axis or plane with respect to said carrier, substantially as shown and described.

7. The combination with a pig handling and breaking machine, having horizontal plungers, of an overhead carrier and a series of sustaining-hooks, as described, together with means for flexibly connecting said series to said carrier, substantially as shown and described.

ALEXANDER E. BROWN.

Witnesses:
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L. F. GRISWOLD.