No. 646,015. Patented Mar. 27, 1900.

H. P. BOULNOIS & J. A. BRODIE.

REFUSE DESTRUCTOR.

(Application filed Dec. 23, 1897.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1.

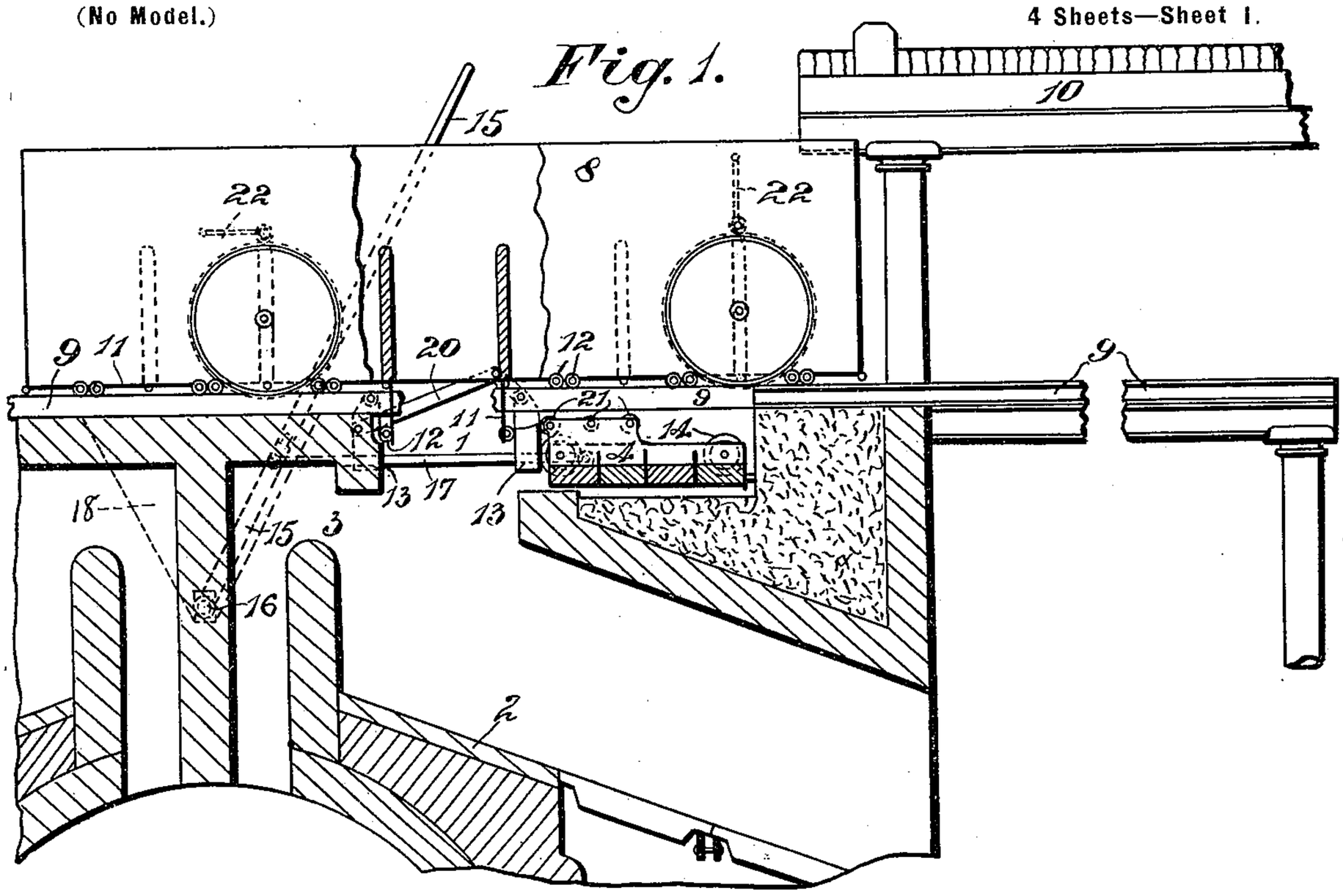

Fig. 2.

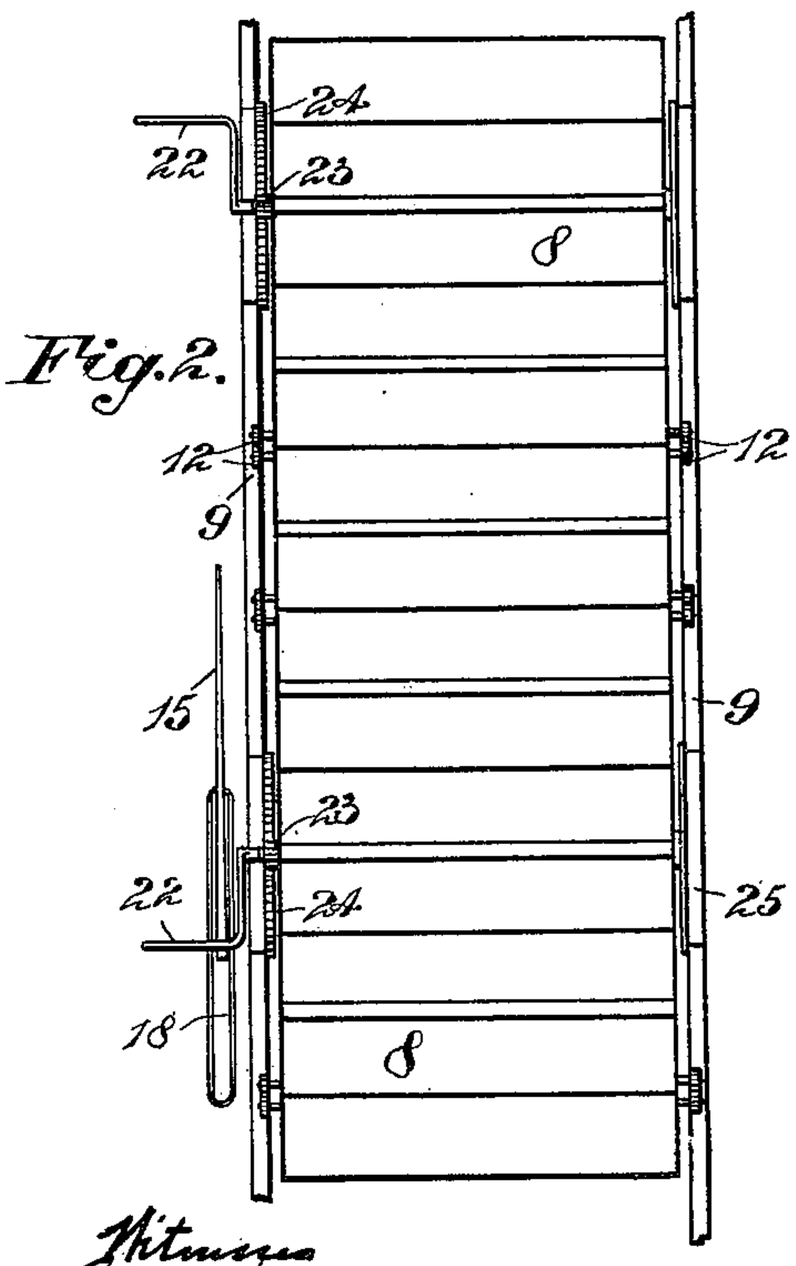

Fig. 3.

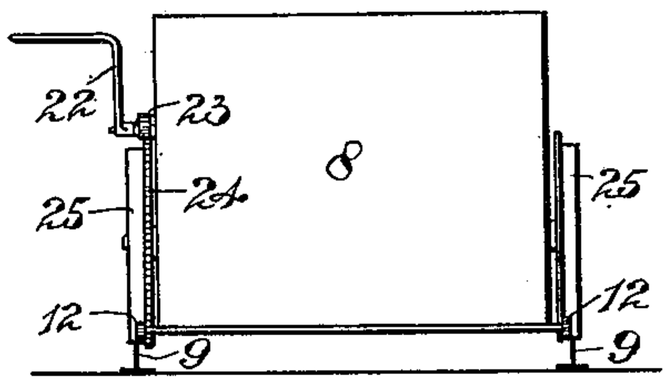

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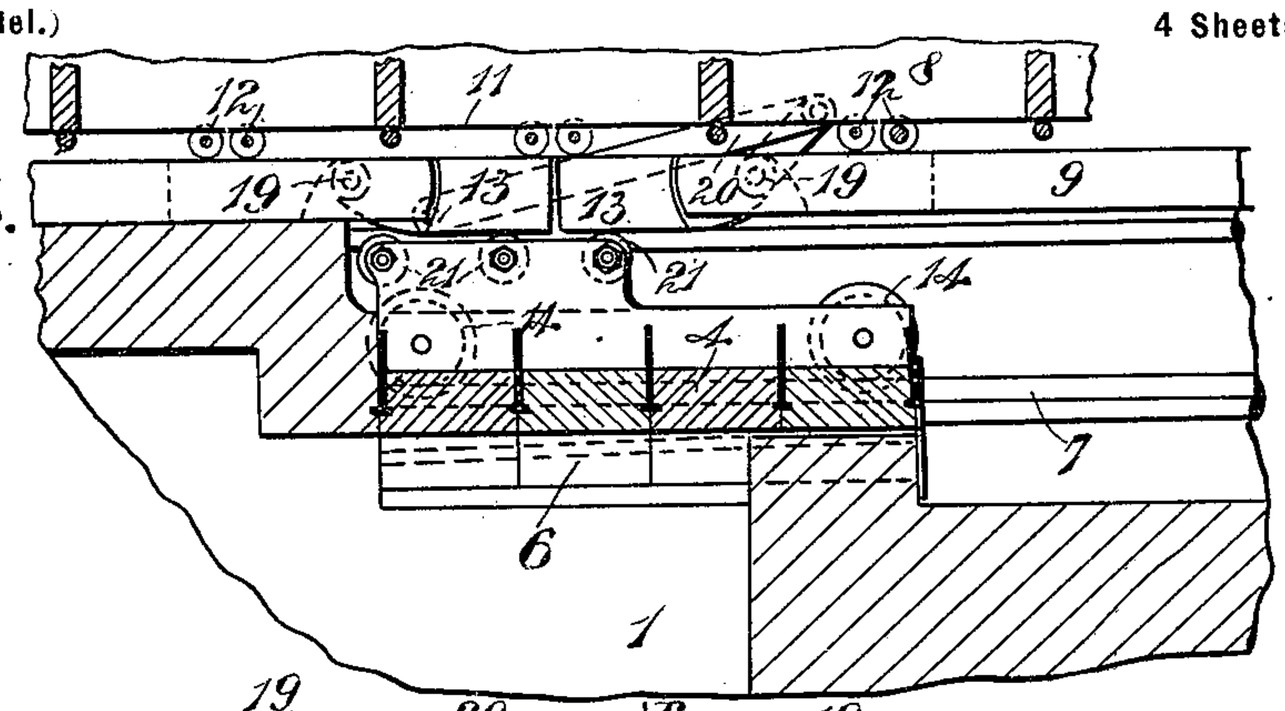
Fig. 4.



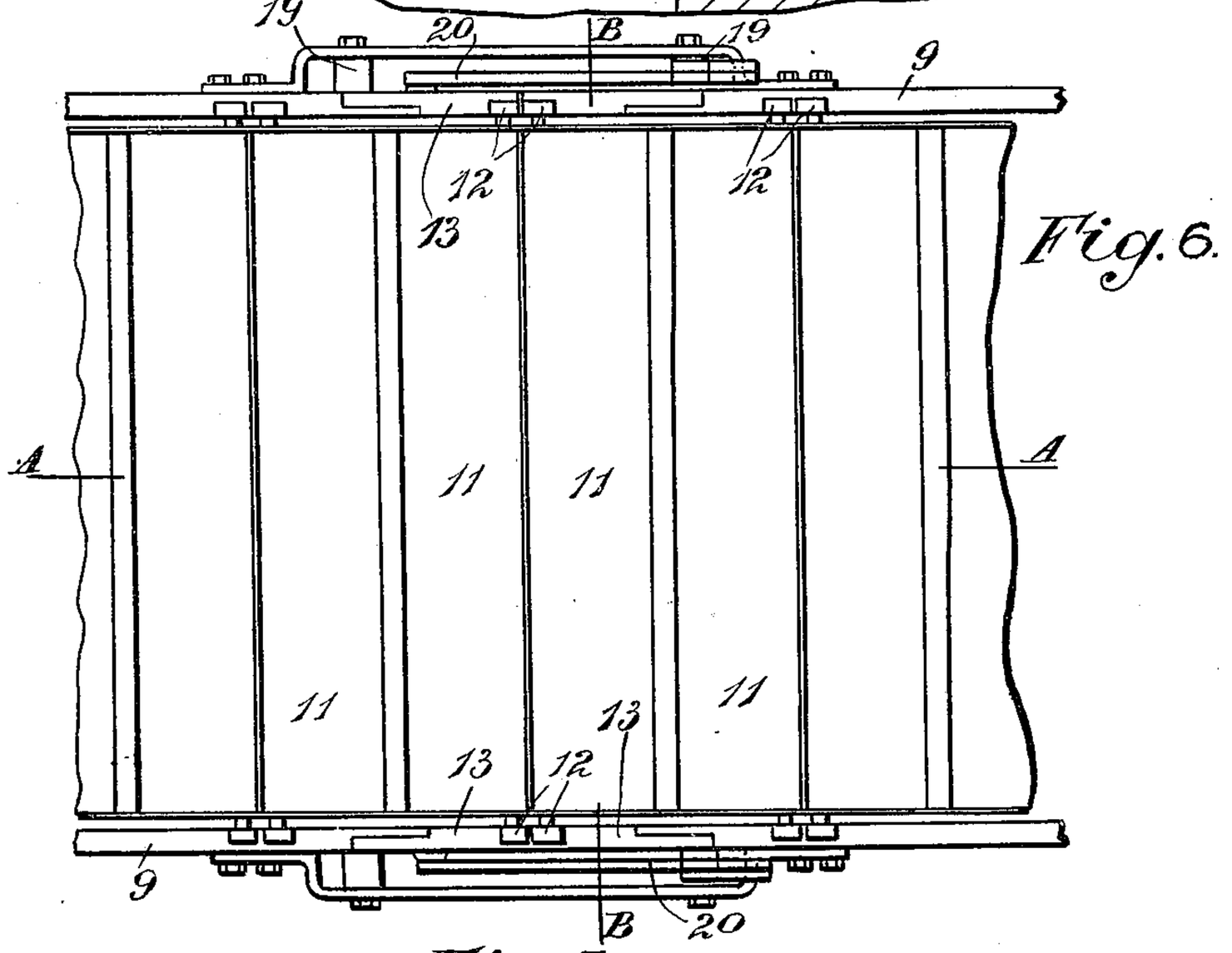
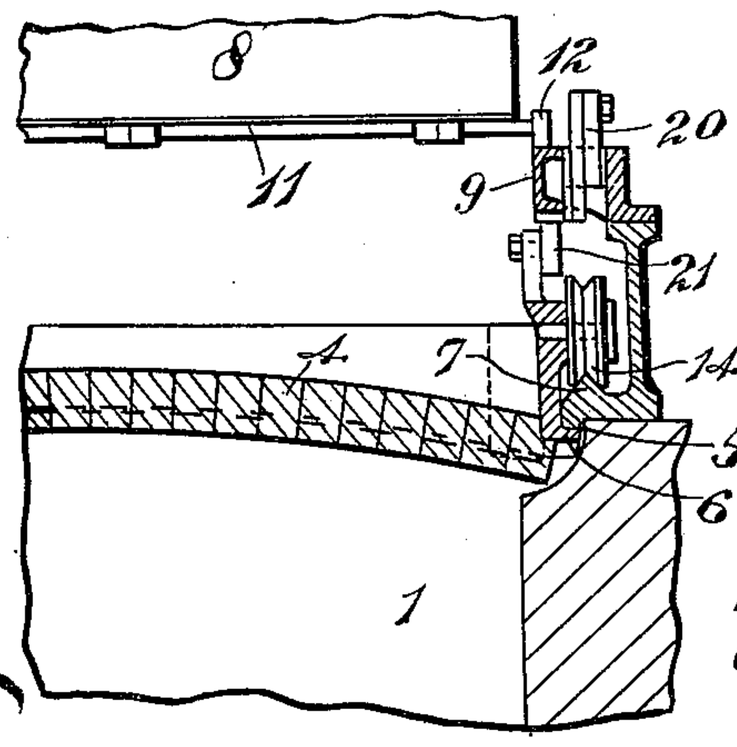


Fig. 6.

Fig. 5.



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REFUSE DESTRUCTOR.

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(No Model.) 4 Sheets—Sheet 3.

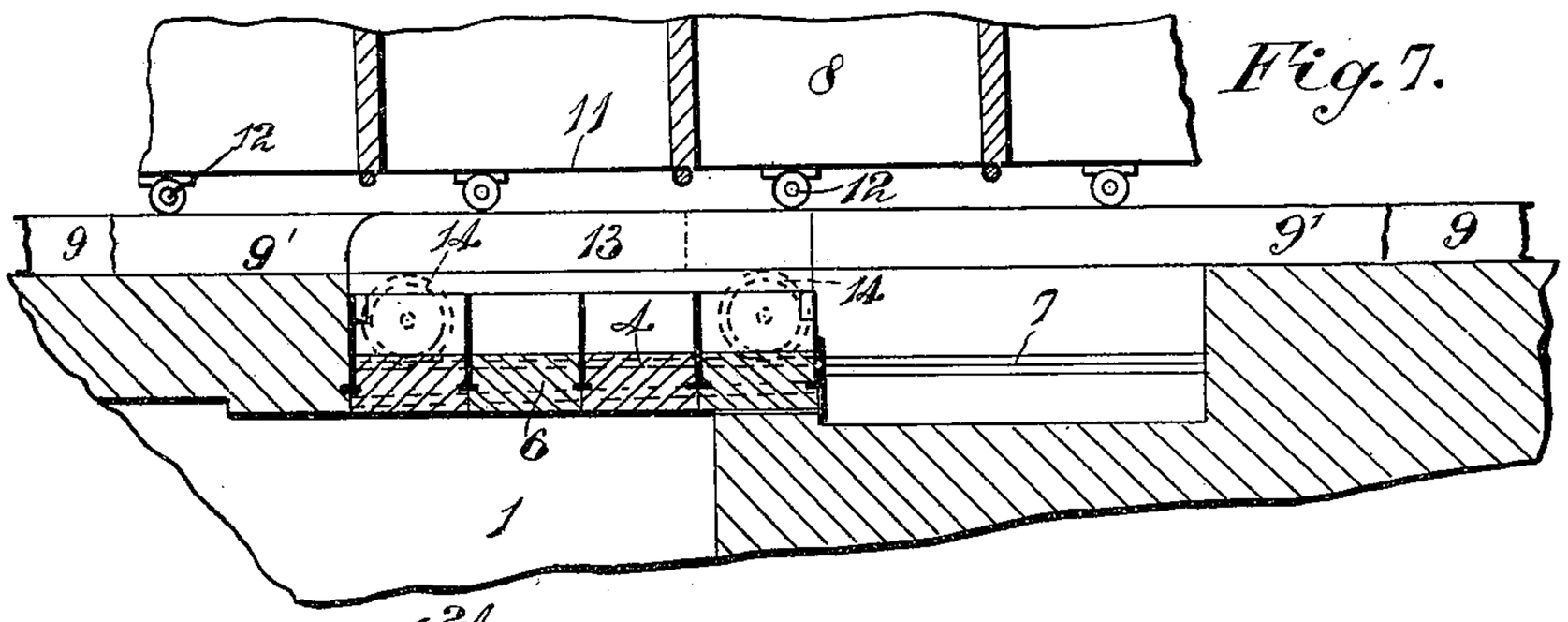

Fig. 7.

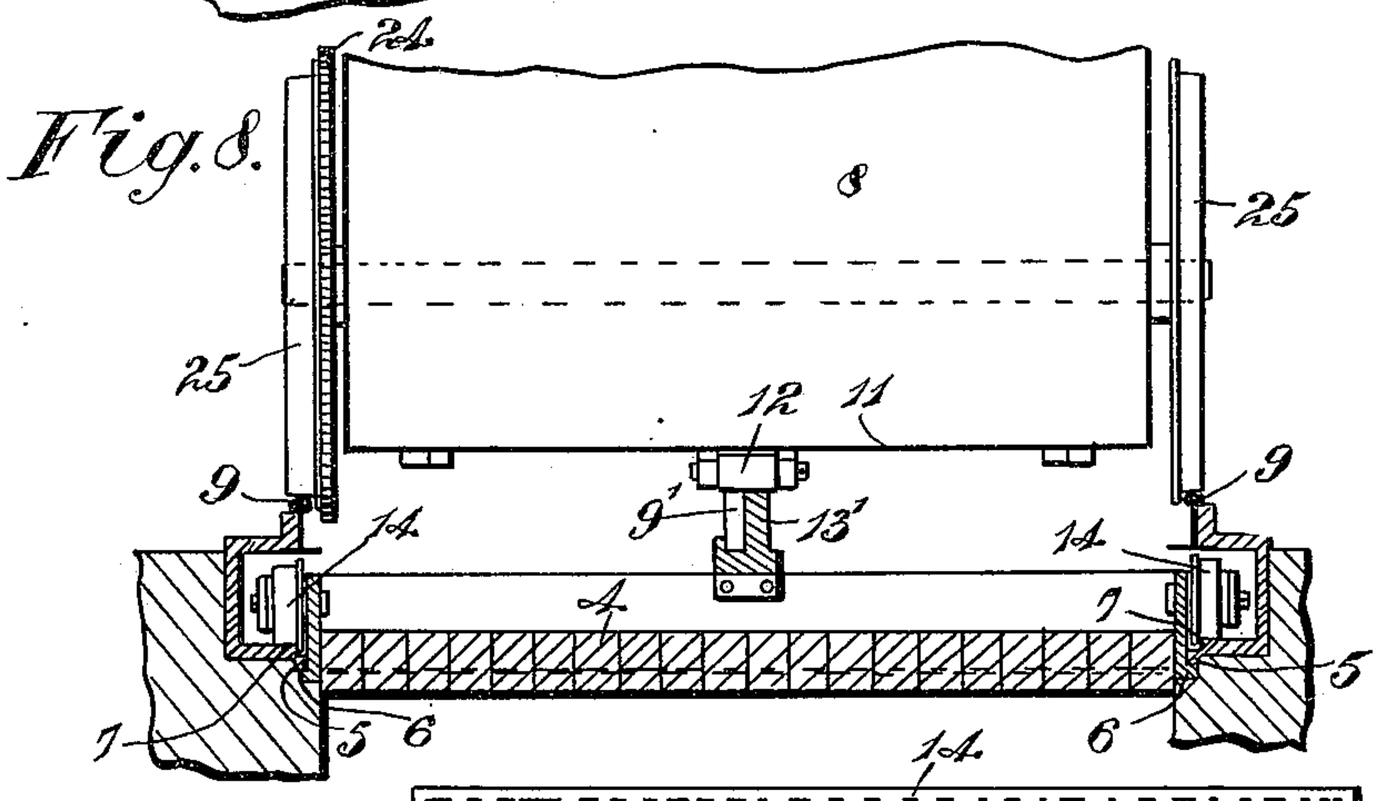

Fig. 8.

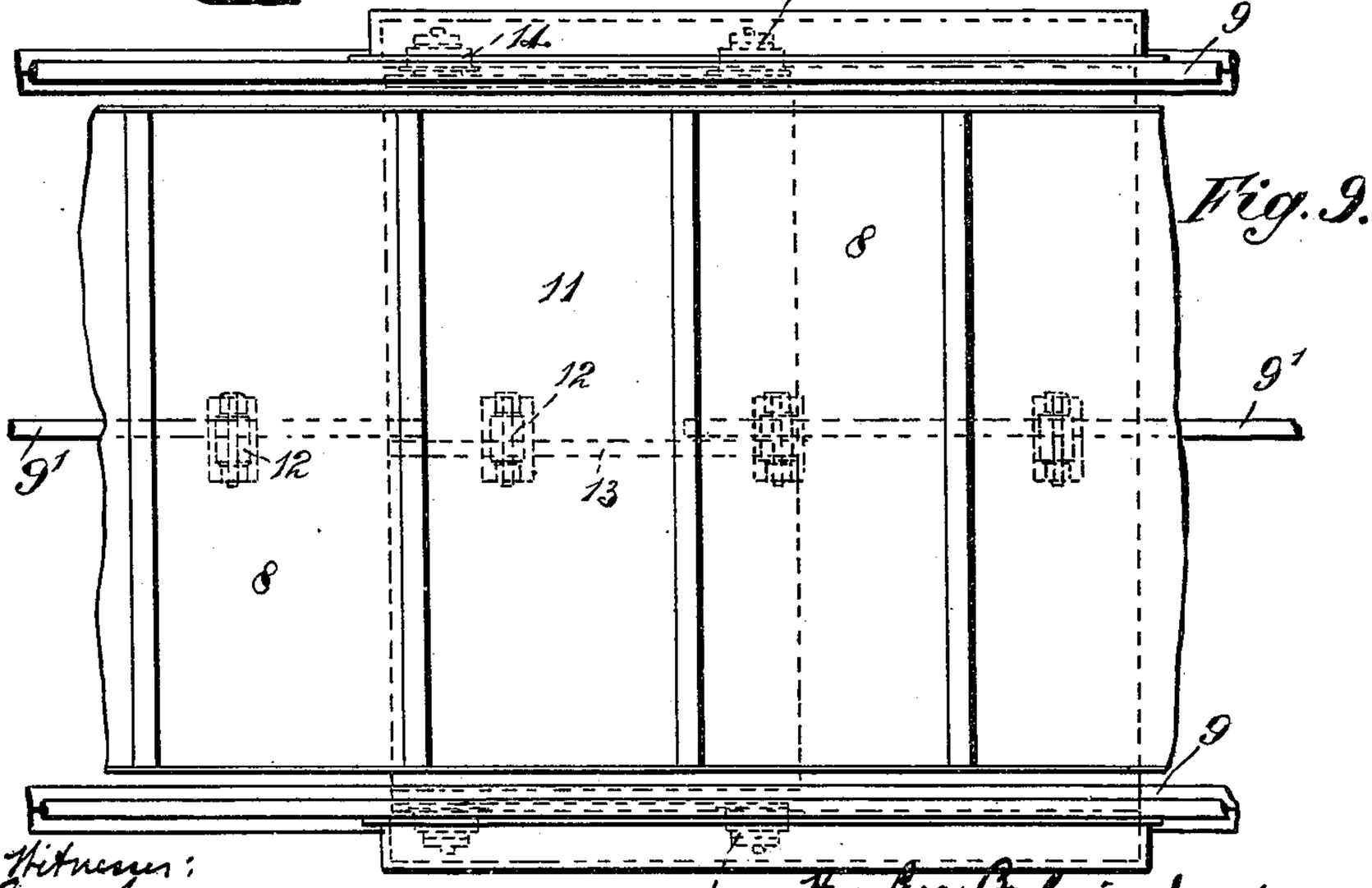

Fig. 9.

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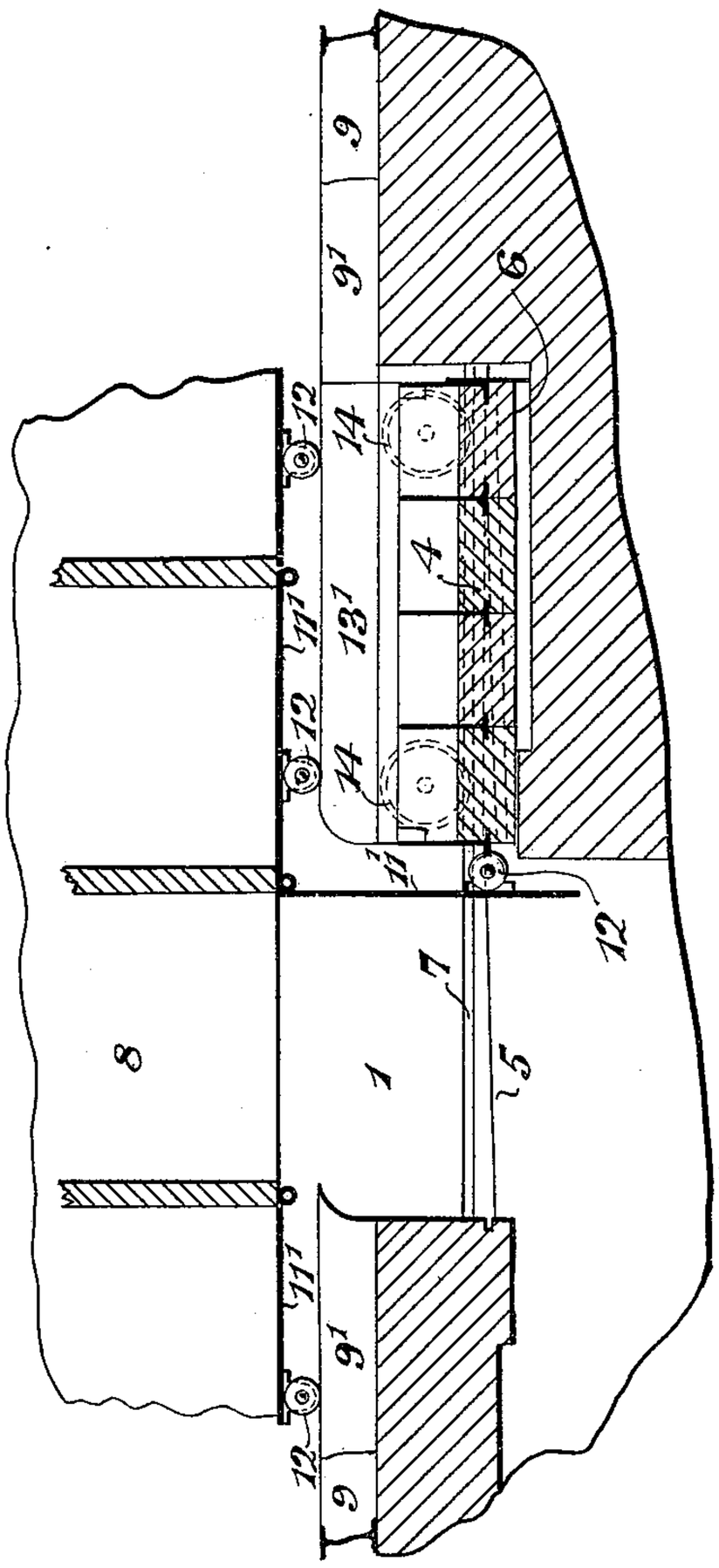
(Application filed Dec. 23. 1897.)

(No Model.) 4 Sheets—Sheet 4.

Fig. 10.



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UNITED STATES PATENT OFFICE.

HENRY PERCY BOULNOIS AND JOHN ALEXANDER BRODIE, OF LIVERPOOL, ENGLAND.

REFUSE-DESTRUCTOR.

SPECIFICATION forming part of Letters Patent No. 646,015, dated March 27, 1900.

Application filed December 23, 1897. Serial No. 663,146. (No model.)

To all whom it may concern:

Be it known that we, HENRY PERCY BOULNOIS and JOHN ALEXANDER BRODIE, subjects of the Queen of Great Britain and Ireland, residing at Liverpool, in the county of Lancaster, England, have invented Improvements in and Relating to Refuse-Destructors, of which the following is a specification, and which was patented in Great Britain November 16, 1891, No. 19,803.

This invention relates to apparatus commonly known as "refuse-destructors" used for burning town refuse and the like; and the object of the invention is to reduce the labor of working such apparatus by modifying the construction thereof and providing appliances for use in connection therewith, whereby handling of the refuse is as far as possible eliminated.

Refuse-destructors consist, usually, of a stack of furnaces or "cells" lying side by side and communicating at their back ends with a common flue. In some cases a double arrangement is adopted, the stack consisting of pairs of furnaces lying back to back on each side of the common flue. The front portion of each furnace is floored with fire-bars, the remaining portion, extending from the ends of the fire-bars to the opening to the common flue, acting as a "drying-hearth." The refuse is fed onto the drying-hearth of each furnace from a charging-platform on the top of the stack through a charging-hole and is pushed or pulled forward onto the fire as required, the fire being worked from the lower or ground level through a fire-door at the front of the furnace. The refuse is tipped onto the charging-platform from a dump or cart platform at a higher level, and as the bulk of the refuse arrives during a comparatively-short part of the day it accumulates, and according to existing arrangements considerable handling is thereby necessitated in order to feed it through the charging-holes. As already stated, the object of our invention is to eliminate as far as possible handling of the material treated in the destructors.

Figure 1 of the accompanying drawings shows, partly in elevation and partly in vertical section, the general arrangement of apparatus according to this invention. Fig. 2 is a plan, and Fig. 3 an end elevation, of the truck. Figs. 4 and 5 are sections on the lines A A and B B, respectively, of Fig. 6; and Fig. 6 is a plan showing enlarged views of details of the charging-door and truck-doors and mechanism for operating them. Figs. 7, 8, and 9 are similar views to Figs. 4, 5, and 6, respectively, showing a modification of the details illustrated in the latter figures. Fig. 10 is a similar view to Fig. 7, but showing certain parts in different positions.

Throughout the drawings similar parts are indicated by the same reference-figures, and in the case of sections the direction in which they are viewed is indicated by the small arrows placed adjacent to the letters denoting the plane of section.

1 is the charging-hole of the furnace, which is placed over the drying-hearth 2 and has a width equal to that of the hearth or approximately so in order that refuse can fall directly onto the hearth. The flue-opening 3 is also preferably made equal or approximately equal in width to the hearth. The door 4 of the charging-hole being comparatively large and exposed to a considerable temperature, it is formed preferably of iron, arched and covered below with fire-brick or other refractory covering. The door 4 is opened and closed, preferably, by traversing it laterally, the seating 5, Fig. 5, against which the projecting ledge 6 on the door closes, being inclined to the rails 7, upon which the wheels 14, supporting the door, traverse, so that when the door is closed the ledge 6 comes into close contact with the said seating 5. The seating may be above or below the corresponding ledge on the door, although the former is generally preferable, as by this arrangement, which is the one shown in the drawings, the refuse cannot lodge on the seating.

The following arrangements are provided for storing the refuse and delivering it into the charging-holes without the necessity of handling it. For each furnace (or pair of furnaces, if so arranged) there is or are provided one or more trucks 8, consisting or each consisting of a number of adjacent compartments or bins placed in line, the width of the

truck being about equal to that of the charging-hole. The side walls of the truck are extended up considerably higher than the transverse division-boards of the adjacent compartments or bins. This permits of the dumping of large cart-loads of refuse directly into the truck, the high sides thereof causing it to run into the various compartments and preventing the material being spilled over. Each truck is carried by wheels 25, running on rails 9, carried on the charging-platform and extended beyond it at each side a sufficient distance to allow all the bins to be brought in succession vertically over the charging-hole or either hole of a pair, as the case may be. The dump or cart platform 10 is placed over the rails sufficiently high to allow the trucks to be run underneath it, and when the carts are tipped the truck is worked along the rails as each bin is filled by means of the handle 22, pinion 23, and spur-wheel 24.

For discharging the bins into the charging-holes the bottoms of the bins are so made that they can be individually opened and closed by suitable gear. The bottoms are preferably made in the form of doors 11, hinged and arranged to open and close automatically when desired by supporting their free ends on rollers 12, arranged to run on rails 9, carried by the charging-platform, portions 13 of the said rails being movable at will, so that when a bin arrives at the proper position over a charging-hole the bottom may be allowed to open by lowering or laterally displacing the portions 13 of the rails upon which it is supported for the time being. If the said movable portions of the rails be supported by the door of the charging-hole, it will be seen that the discharge of the bins becomes automatic as a result of opening the charging-door.

The charging-hole door, as before mentioned, is carried by wheels 14, running on rails 7, and it is closed or opened by means of the lever 15, working in a recess or guide 18, formed in the top of the furnace. This lever is fulcrumed at 16 and connected to the door 4 by the connecting-rod 17. The details of the door 4 and the arrangement whereby the opening of the door allows the bottom of the bin over the charging-hole to open are shown in Figs. 4 to 10.

Figs. 4, 5, and 6 show an arrangement whereby the bottom of each bin is formed by two doors 11 and in which there are two movable parts 13 to each main rail 9, which drop down when the door 4 opens.

Figs. 7 to 10, inclusive, show an arrangement in which the bottom of the bin is formed by one door and in which the movable part of the rail is carried by the door 4 and is displaced laterally when the latter is opened.

The rollers 12 of the doors 11 are supported by the movable portions 13 of the rails 9, these movable portions being fulcrumed at 19 and connected together by a connecting-rod 20. The movable portions are supported by the bearing-rollers 21, carried by the framework of the door 4. It will be seen that when the door 4 is opened the portions 13 and the doors 11 drop into a vertical position, as shown in Fig. 1, and allow the refuse from the bin to fall through the charging-hole 1 onto the hearth 2. When the door 4 is closed, the first bearing-roller 21 raises the near movable rail, and the other rail is raised by the connecting-rod 20, and when the door 4 is fully closed the bearing-rollers support the movable rails, which in turn support the doors 11.

Figs. 7, 8, and 9 are analogous views to Figs. 4, 5, and 6 and illustrate a modification of the details shown in the latter views. The bottom of each bin in the modified arrangement is formed by a single door 11, which construction admits of there being but one movable part 13′ of the rail 9′, which supports the rollers 12 and which is now separate from the main rails, which may be made continuous. The movable part 13′ is carried by the door 4 and when endwisely displaced by the door being opened allows the door 11 to drop into a vertical position, as shown in Fig. 10, and so leaves the refuse free to drop through the charging-hole 1 onto the drying-hearth.

The capacity of the trucks should be sufficient to store the greatest accumulation of refuse that is likely to occur during the ordinary working of the destructor, and the capacity of each bin is preferably just sufficient to fully charge the furnace when discharged into the latter.

What we claim is—

1. In a refuse-destroying apparatus, the combination of a raised dump-platform, a destructor-furnace arranged at a lower level than said platform and having a charging-opening in its top, a door closing said charging-hole, a track extending longitudinally below said platform and above said furnace, a truck divided by transverse partition into a series of compartments each having a movable bottom, said truck being mounted to move endwise on said track so that its compartments can be moved in succession below the discharging end of said platform and brought over said charging-hole, means for opening the door of said charging-hole, and means for opening the movable bottom of each compartment when brought above said charging-hole, substantially as described.

2. In a refuse-destroying apparatus, the combination of a destructor having a charging-hole, a truck supported above the destructor and divided into a series of compartments, each of these compartments having a movable bottom and the truck being movable so as to bring the compartments in succession over the charging-hole, a door closing the charging-hole, and means whereby the opening of said door automatically opens the movable bottom of the truck-compartment registering with the charging-hole, substantially as described.

3. The combination of a furnace having a

charging-opening, a door for closing the same, a movable truck above the charging-opening and having a movable bottom, means for preventing the opening of the bottom until it registers with the charging-opening, and devices for simultaneously opening the bottom and the charging-door when the truck-compartment registers with the charging-opening, substantially as described.

4. The combination of the truck having hinged doors 11, rollers 12, hinged rails 13 and bearing-rollers 21 carried by the door 4, substantially as described and illustrated.

5. The combination of the truck having hinged doors 11, rollers 12 and rail 13′ carried by the door 4, substantially as described and illustrated.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

HENRY PERCY BOULNOIS.
JOHN ALEXANDER BRODIE.

Witnesses to the signature of Henry Percy Boulnois:

J. J. BROUGHAM,
C. E. BROUGHAM.

Witnesses to the signature of John Alexander Brodie:

JAMES W. ALSOP,
ALFRED WILKINSON.