

No. 674,354.

Patented May 14, 1901.

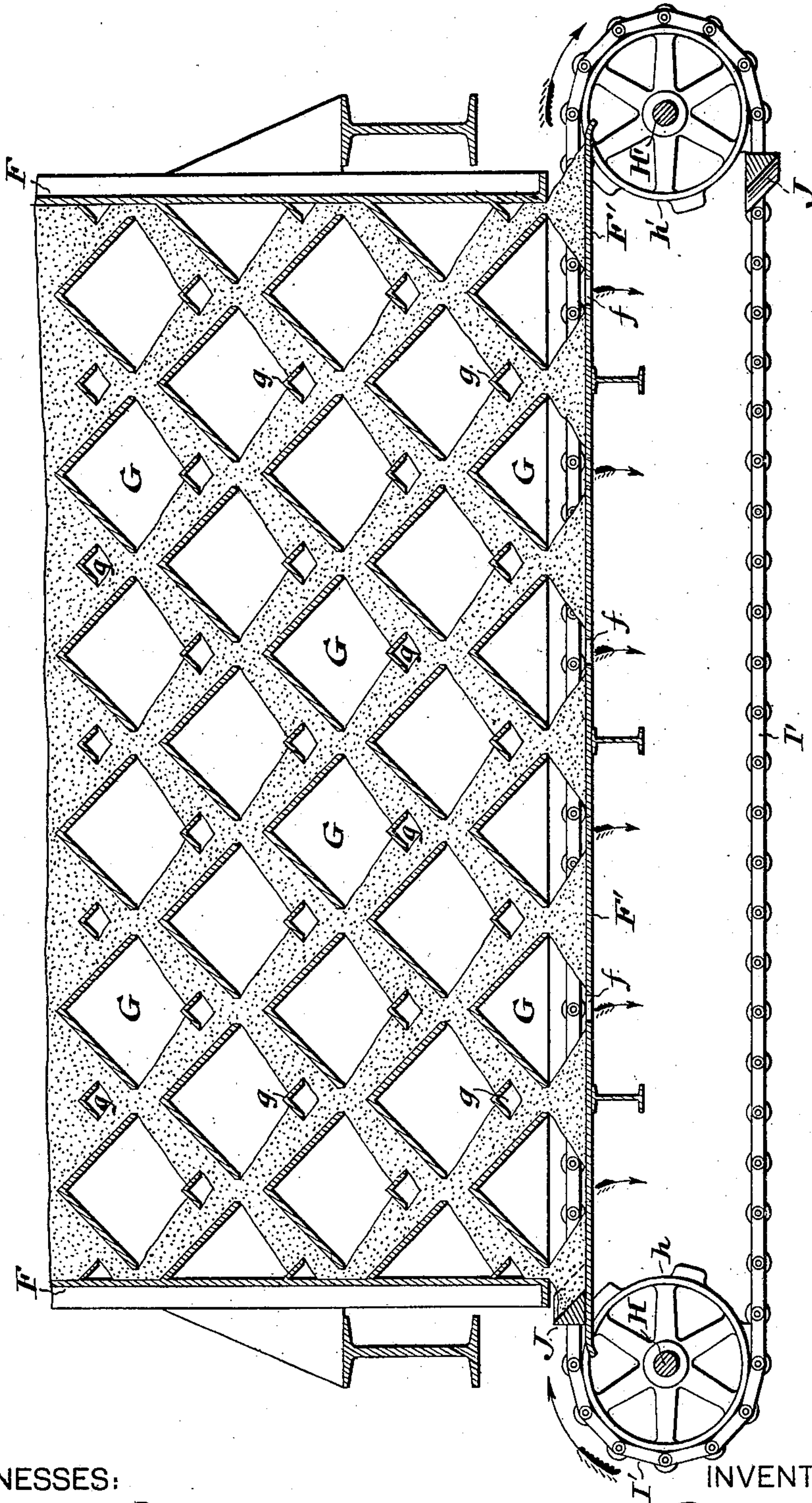
F. C. DURANT.  
ORE COOLING DEVICE.

(Application filed Dec. 22, 1899.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 1



WITNESSES:

*Arthur E. Paige*  
*James H. Bell*

INVENTOR:

*F. C. Durant*  
*My Mary & Paul, Attorneys.*

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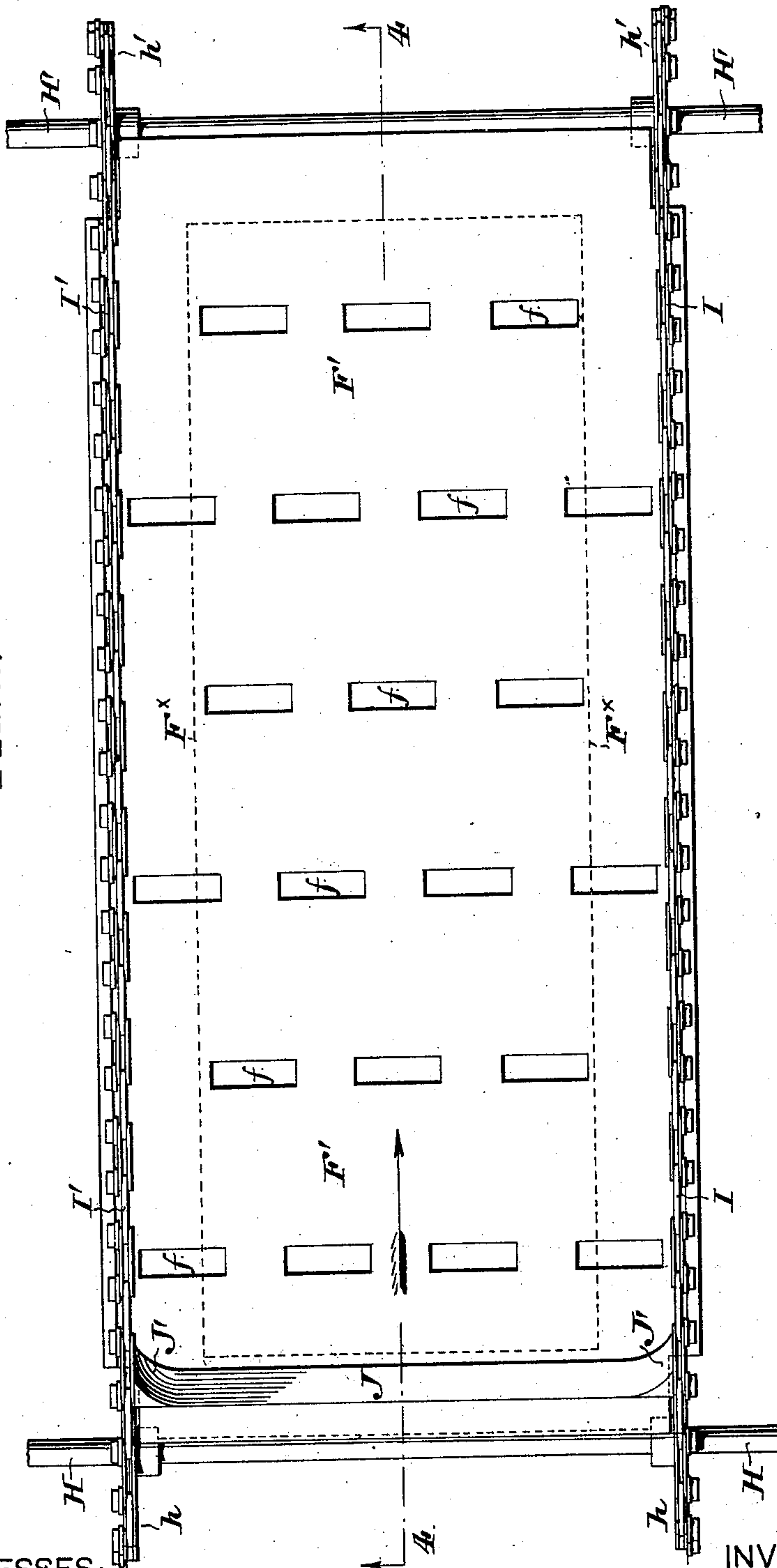
F. C. DURANT.  
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2 Sheets—Sheet 2.

(No Model.)

FIG. 2.



WITNESSES:

*Arthur E. Paige*  
*James H. Bell*

INVENTOR:

*F. C. Durant,*  
*My Proxy & Paul,*  
*attorneys.*



# UNITED STATES PATENT OFFICE.

FREDERICK C. DURANT, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO SPENCER PENROSE, CHARLES L. TUTT, AND CHARLES M. MACNEILL, OF COLORADO SPRINGS, COLORADO.

## ORE-COOLING DEVICE.

SPECIFICATION forming part of Letters Patent No. 674,354, dated May 14, 1901.

Application filed December 22, 1899. Serial No. 741,338. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK C. DURANT, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, but now temporarily residing at Colorado Springs, in the State of Colorado, have invented certain new and useful Improvements in Ore-Cooling Devices, whereof the following is a specification, reference being had to the accompanying drawings.

The object of my invention is to provide an efficient means for cooling roasted ore rapidly and uniformly.

Where the cooling of ore has been effected by passing it continuously through a receptacle containing conduits or passages which permit the circulation of currents of air through the body of the ore, it has been found that there is a marked tendency for the hot ore to make localized channels, and thus take a short cut through the apparatus, leaving therein an accumulated mass of cooler material, which remains almost permanently in the chamber, so that thereafter additions of hot ore result to a great extent in the immediate discharge thereof through the self-formed channels without material lowering of its own temperature. I have found that this difficulty can be obviated or minimized by the action of such an apparatus as is hereinafter described, the important feature of operation being the repeated detention of the ore, either as a whole or in localized regions of its path practically at rest, for a period of time sufficient to check the tendency of the hot ore to find short cuts through the mass of material. The cooling effect is thus practically uniform upon all of the ore that passes through.

In the accompanying drawings, Figure 1 represents a central longitudinal section through the apparatus embodying my invention, and Fig. 2 is a plan of the apparatus with the chamber and its sheds removed.

F designates the ore-chamber, rectangular in shape and provided with series of transverse A-shaped sheds G g, arranged in zigzag order, as clearly shown in Fig. 1, to subdivide the descending body of ore and form air-conduits therethrough, the sides of the chamber

being provided at the ends of every shed with openings for the free passage of air. The floor of the chamber is represented at F' and is separated from the body thereof by a short interval to permit the longitudinal travel of the discharging devices, as will hereinafter be described.

The floor F' of the ore-chamber is considerably wider than the chamber itself, the dimensions of the latter being indicated by the dotted lines at F<sup>x</sup> in Fig. 2. Discharge-openings f, preferably staggered, as shown, are formed in the floor. Beneath each end of the floor F' transverse shafts H H' are arranged, said shafts carrying sprocket-wheels h h and h' h', respectively, which engage with and actuate the endless chain belts I I', carrying discharge-scrappers J—in this instance two in number. Said scrapers extend across the floor and are arranged to travel in contact with the surface thereof during their passage above the same, and the ends of the scrapers are curved, as indicated at J', so as to throw any material which they encounter upon that portion of the floor inwardly and prevent its falling over at the sides. The sprocket-wheels are actuated by suitable driving mechanism, (not shown,) and as they rotate the chain belts bring the scrapers alternately into position to sweep along the floor F'. As will be noted, the discharge-openings f are arranged beneath the center of the respective conduits G of the lower row, the result of this arrangement being that when the chamber is filled with ore it will find a position of rest, and consequently no discharge will take place through the openings unless the ore is disturbed. The necessary disturbance is effected by the travel of the scrapers J, which as they pass along the floor dislodge the body of the ore resting thereon, carrying it to the openings f, and thus effect the desired discharge in the direction of the arrows in Fig. 1. The chain belts travel slowly, and as the scrapers are only operative upon that portion of the ore which is in their immediate vicinity it will be seen that the discharge will be effected successively at each row of openings f and that the main body of ore will be at rest in the chamber except when the



scraper is operative for the time being. This system insures the detention of the ore in the chamber for a sufficient time to prevent it from channeling or making a short cut, 5 and thus attains the desired object.

Having thus described my invention, I claim—

1. In combination with an ore-chamber, having a series of air-inlets in its sides, a series of sheds or inverted-trough-like conduits 10 connecting said air-inlets, and discharge-openings in the bottom of the chamber, and directly under and covered by each shed of the lower series of sheds, of a discharge device 15 movable along the bottom of the chamber, and means for actuating the same, said discharge device being so constructed and arranged as to intermittently discharge the material; substantially as described.

20 2. The combination of an ore-chamber, hav-

ing its bottom spaced from its walls, and provided with discharge-openings, series of sheds in the chamber, the sheds of one series alternating with those of the next series to subdivide the ore and form air-conduits there- 25 through, the walls of the chamber having air-inlets at the ends of the several sheds and the sheds of the lower series extending over the discharge-openings, with a discharge device traveling across said bottom, and comprising endless chains exterior to the cham- 30 ber, and a scraper having inwardly-curved ends and connected at its ends to said chains, and means for actuating said chains; substantially as described.

FREDERICK C. DURANT.

Witnesses:

JAMES H. BELL,  
E. REESE.