

(Model.)

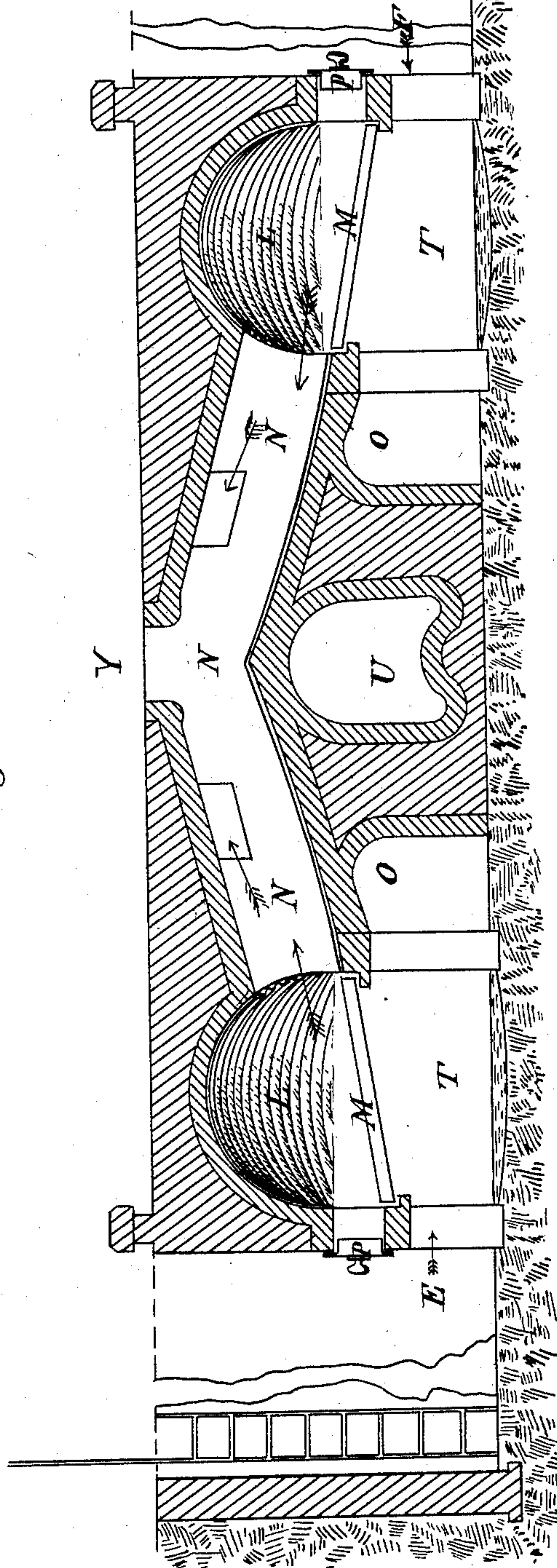
4 Sheets—Sheet 1.

J. E. STAFFORD & J. T. PEARSON.
FURNACE FOR THE COMBUSTION OF REFUSE.

No. 363,558.

Patented May 24, 1887.

Fig. 1.



Witnesses.

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(Model.)

4 Sheets—Sheet 2.

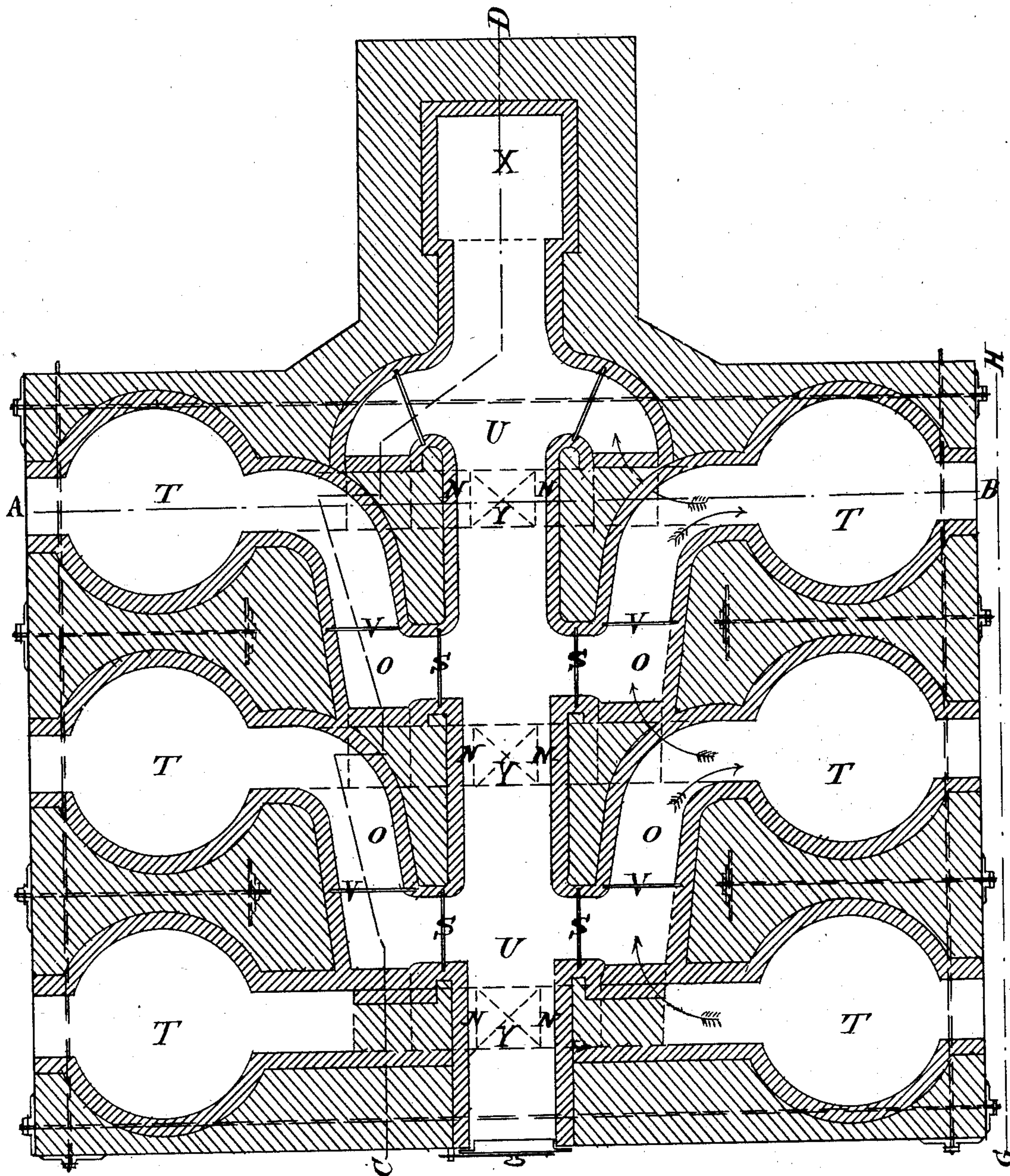
J. E. STAFFORD & J. T. PEARSON.

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Fig. 2.



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Fig. 3.

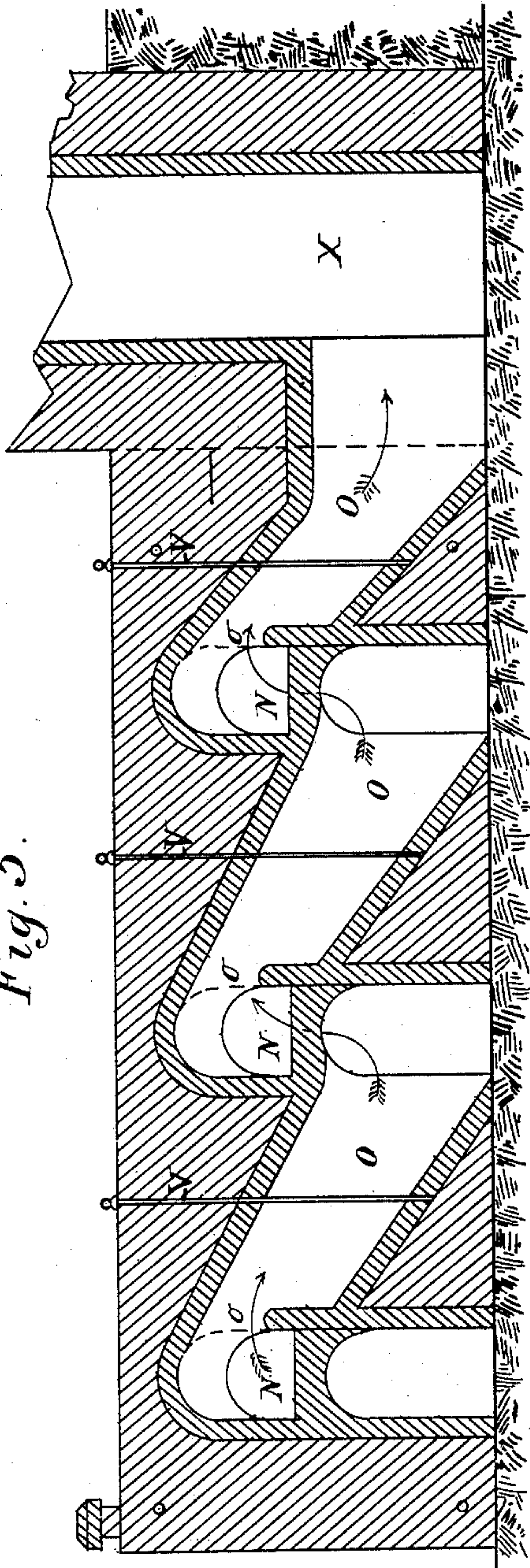


Fig. 4.

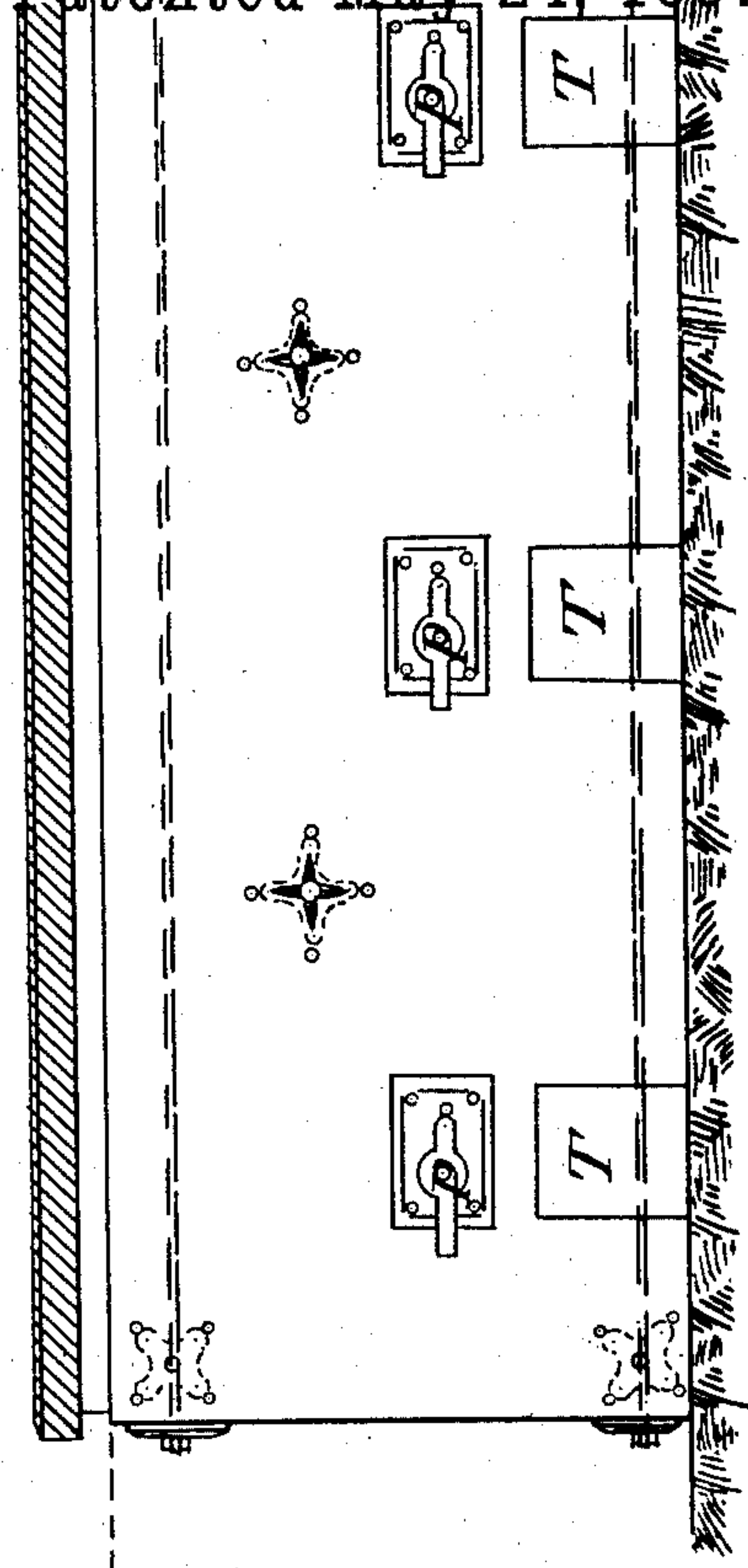
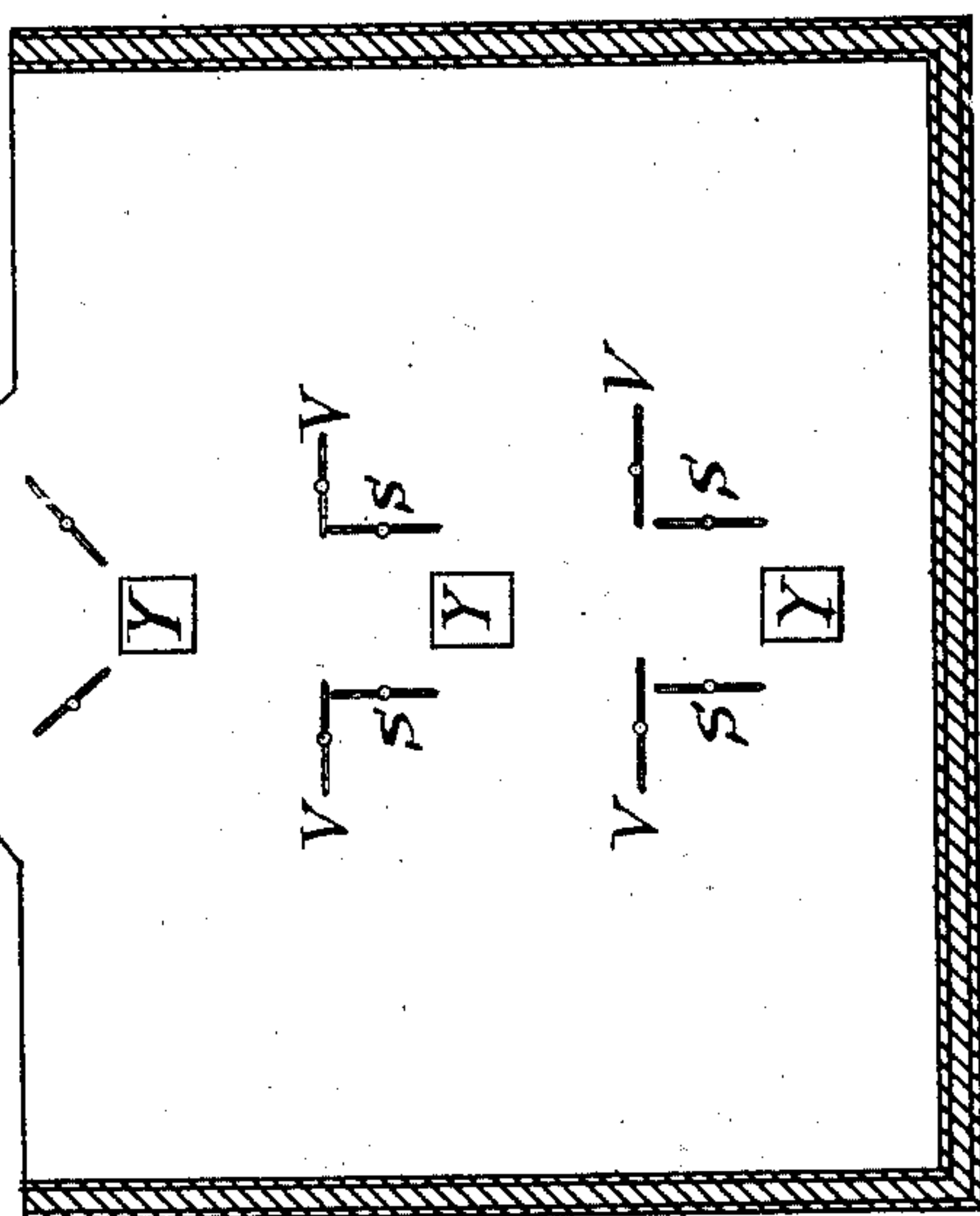


Fig. 5.



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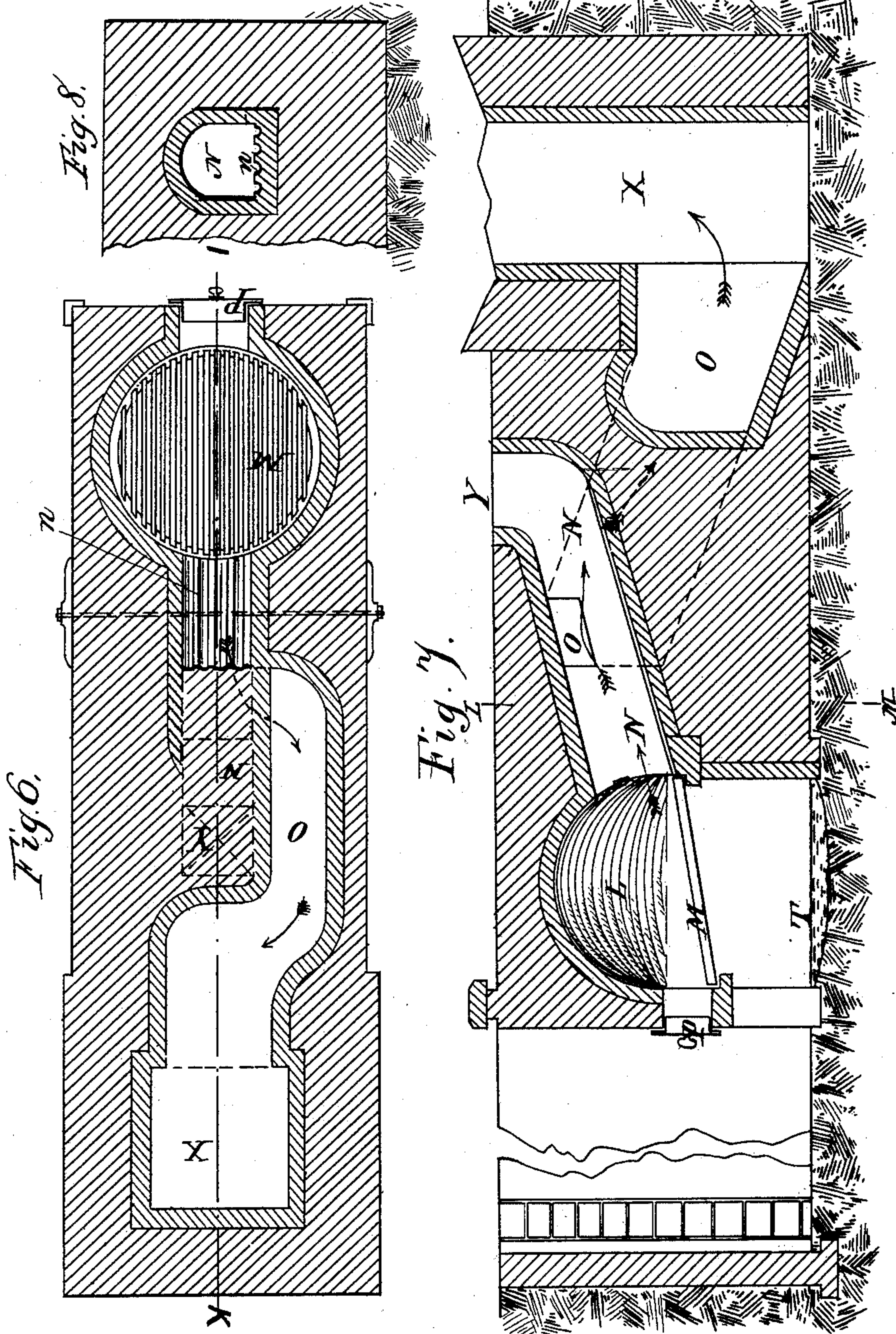
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UNITED STATES PATENT OFFICE.

JOHN EDWARD STAFFORD AND JAMES TOWNSLEY PEARSON, OF BURNLEY,
COUNTY OF LANCASTER, ENGLAND; SAID STAFFORD ASSIGNOR TO JOHN
STEPHENSON, OF SAME PLACE.

FURNACE FOR THE COMBUSTION OF REFUSE.

SPECIFICATION forming part of Letters Patent No. 363,558, dated May 24, 1887.

Application filed July 17, 1885. Serial No. 171,891. (Model.) Patented in England February 21, 1884, No. 3,864; in Austria-Hungary March 7, 1884, No. 45,222; in France April 2, 1884, No. 161,370; in Belgium November 26, 1884, No. 67,011; in Germany November 27, 1884, No. 32,092; in Italy December 31, 1884, No. 2,396; and in Spain July 10, 1885, No. 7,237.

To all whom it may concern:

Be it known that we, JOHN EDWARD STAFFORD, a subject of the Queen of Great Britain, residing at Swindlehurst House, Burnley, in the county of Lancaster, England, and JAMES TOWNSLEY PEARSON, a subject of the Queen of Great Britain, residing at 3 Albert street, Burnley aforesaid, have invented certain new and useful Improvements in Furnaces for the Combustion of Towns' Refuse, (for which we have obtained a patent in Great Britain, No. 3,864, dated February 21, 1884; France, No. 161,370, dated April 2, 1884; Belgium, No. 67,011, dated November 26, 1884; Austria, No. 45,222, dated March 7, 1884; Germany, No. 32,092, dated November 27, 1884; Italy, No. 2,396, dated December 31, 1884, and Spain, No. 7,237, dated July 10, 1885,) of which the following is a specification.

This invention relates to improvements in the construction of furnaces or "destructors" for the combustion of animal, vegetable, and other decomposed matter or town's refuse, embracing novel arrangements and devices applied to single, double, or to a series of furnaces, the design of which improvements has reference to the reduction of the noxious fumes and vapors evolved during the combustion of the refuse, to economy in the cost of constructing and maintaining the furnaces in working order, and to the economical combustion of the refuse in respect of coal and of labor.

In order that our invention may be properly understood and readily carried into effect, we have hereunto attached the accompanying sheets of drawings, reference being had to the figures and letters marked thereon, the same letters referring to the same parts in the various views and figures.

Figure 1 represents a transverse section, taken in the plane of the line A B, Fig. 2, of a block of six furnaces placed back to back and designed for the combustion of town's refuse on a large and extended scale. Fig. 2 is a horizontal section taken in the plane of the line E F, Fig. 1. Fig. 3 is a longitudinal section taken in the plane of the line C D, Fig. 2. Fig. 4 is a side elevation of the same, and Fig. 5 a reduced plan view, showing the

top of these furnaces and the arrangement and position of the dampers, and also the charging-holes through which the refuse to be consumed is tipped. Fig. 6 is a horizontal section showing arrangements for a single furnace or destructor, and Fig. 7 a vertical section of the same taken in the plane of the line I K, Fig. 6; and Fig. 8 is a transverse section on the line L M, Fig. 7.

These furnaces or destructors are built of brick-work and braced firmly together by suitable tie-rods and plates, as shown on the drawings. The inner walls or lining of the furnaces and flues are built of fire-brick, and the walling not in immediate contact with the flame and heated gases is built of common red brick.

L represents the combustion chamber; M, the fire-bars or grating; N, the refuse-chamber; O, the communicating flues conveying waste heat and noxious fumes and vapors from one furnace to another. V and S are dampers to divert the course of the gases into the main flue, in case their continuity of action from one furnace to the other be interrupted, and P is a doorway through which fuel is charged upon the grating or fire-bars to support the combustion of the refuse and for the removal of clinkers as they form from time to time on the bars or grating. The hot ashes falling through the grating are received in a reservoir of water contained in the chamber or ash-pit T.

In this arrangement of furnaces the refuse to be consumed may be conveyed by carts or trucks over the mouth or opening Y, down which the refuse may be tipped each way upon the inclined floors of the two adjoining furnaces, sufficient refuse being deposited to choke or fill up the opening.

In commencing operations fuel is fed through the doorway P to support the combustion of the refuse until the process is in full operation, when the application of coke or coal is discontinued, the burning refuse now serving as fuel for subsequent deposits of refuse which may be placed upon it.

Each furnace is provided with a dome-shaped roof, the inner surface of which is preferably

corrugated to present to the flame and heated gases an extended heating-surface, against which they impinge in ascending from the burning refuse on the fire-bars or grating M, and are deflected on the refuse. This impingement of the heated gases will also impart to the curvature of the dome a considerable amount of heat, which is transmitted to the refuse by radiation.

The direct and indirect action of the heated gases, as above described, will not only effect a thorough combustion of the refuse deposited on the grating, but will insure a considerable reduction of the noxious fumes and vapors evolved during the process of combustion.

The heated gases, after their deflection on the refuse in the chamber L, enter the refuse-chamber N, upon the corrugated floor of which (see *u*, Fig. 6) the refuse is deposited and most thoroughly and effectively dried preparatory to being drawn or pushed down by a rake upon the grating M to be consumed. The throat *o* of each communicating flue O is considerably contracted, that the gases may be confined and prevented from passing away too freely, that the reverberation of the flame and heated gases may dry the refuse more effectually before entering the contracted throat of the flue O, down which they are conveyed under the grating of the adjoining furnace, mixing with the heated gases newly evolved in this furnace, accumulating as they proceed through each succeeding furnace, insuring a most effectual reduction of the noxious fumes and vapors.

If from any cause the continuous action of the heated gases from one furnace to another be interrupted, or it be desired to burn the refuse separately in each furnace without the assistance of the heated gases from the adjoining furnaces, the dampers V are closed and the dampers S opened to allow the heated gases from each furnace to pass direct into the main flue U to the chimney X.

Referring to Figs. 6 and 7, we would observe that the course and action of the heated gases are similar in every respect, as described in the foregoing description, with the exception that the gases, after leaving the refuse-chamber N, are conveyed down the flue O direct to the chimney X.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is—

1. The combination, with a series of combustion-chambers located back to back, of the oppositely-inclined refuse-chambers N, leading to said combustion-chambers, and the flues O between the combustion-chambers, said flues communicating at one end with an exit-flue and at the other end with the lower part of a combustion-chamber to establish communication between the chambers and provided with contracted throats *o*, substantially as described.

2. The combination, with a series of combustion-chambers, of a series of oppositely-inclined refuse-chambers leading to the respective combustion-chambers, a series of valved flues between the respective combustion-chambers, said flues communicating at one end with an exit-flue and at the other end with the lower part of a combustion-chamber to establish communication between the chambers, and a main flue communicating with said valved connecting-flue, substantially as described.

3. In a furnace for the combustion of refuse, the combination, with a series of combustion-chambers located oppositely to each other or back to back, of the oppositely-inclined refuse-chamber N, with central opening, Y, flues O between the combustion-chambers and communicating at one end with an exit-flue and at the other end with the lower part of a combustion-chamber and establishing a communication between the chambers, dampers located in said flues, and flue U, connecting with said flues O, substantially as described.

4. The combination, with a series of combustion-chambers, L, communicating with each other, inclined refuse-chambers N, communicating flues O, and main flue U, of the dampers V S, located in flues O, substantially as herein described, for the purposes set forth.

In testimony whereof we have hereunto set our hands this 20th day of June, 1885.

JOHN EDWARD STAFFORD.

JAMES TOWNSLEY PEARSON.

Witnesses:

RICHARD LEEMING,

ALFRED WALSH,

Both of 2 Lime street, Preston.