No. 863,718. PATENTED AUG. 20, 1907.

E. G. JEWETT.

WOOD DISTILLING APPARATUS.

APPLICATION FILED MAY 24, 1906.

4 SHEETS—SHEET 1.

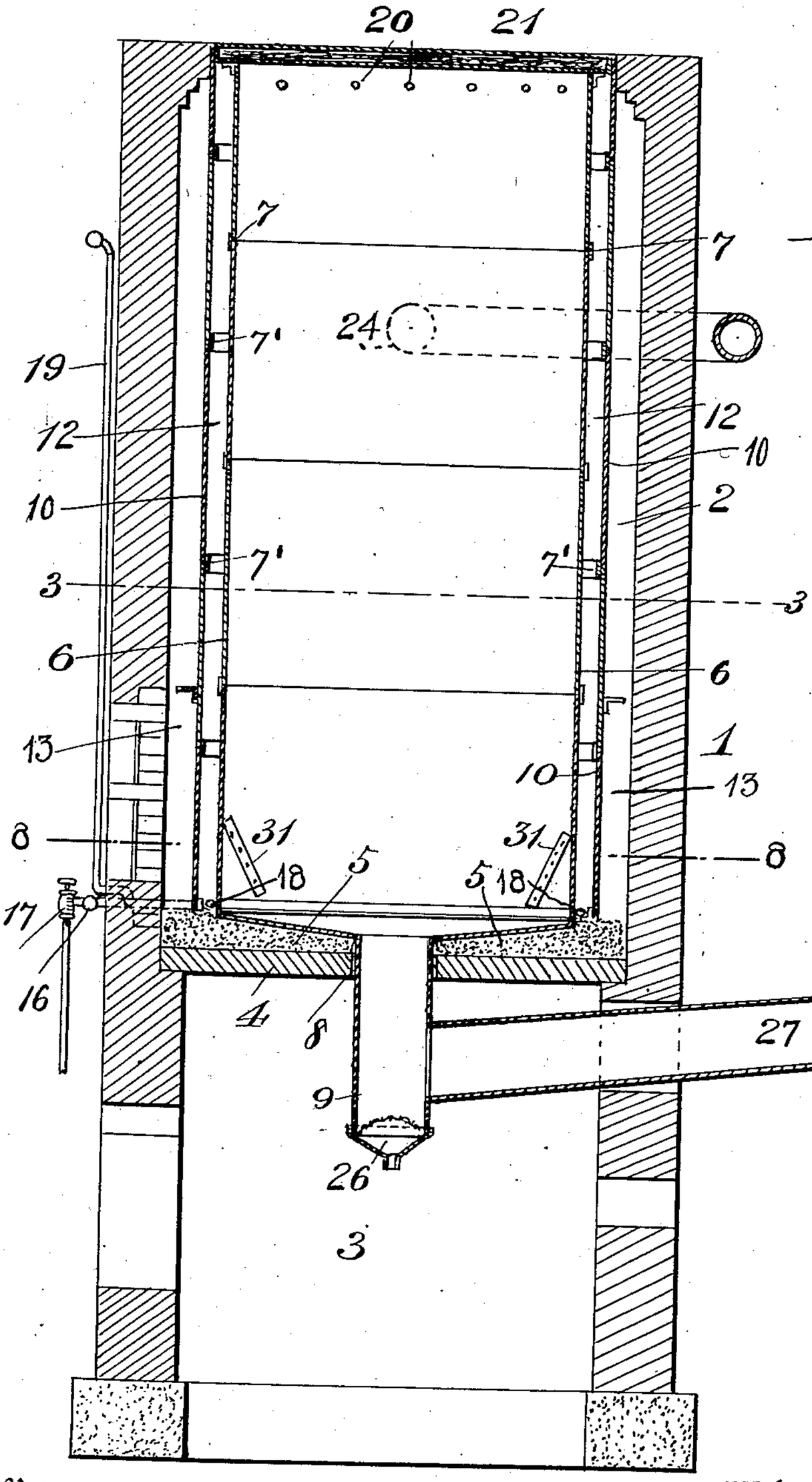

Fig. 1.

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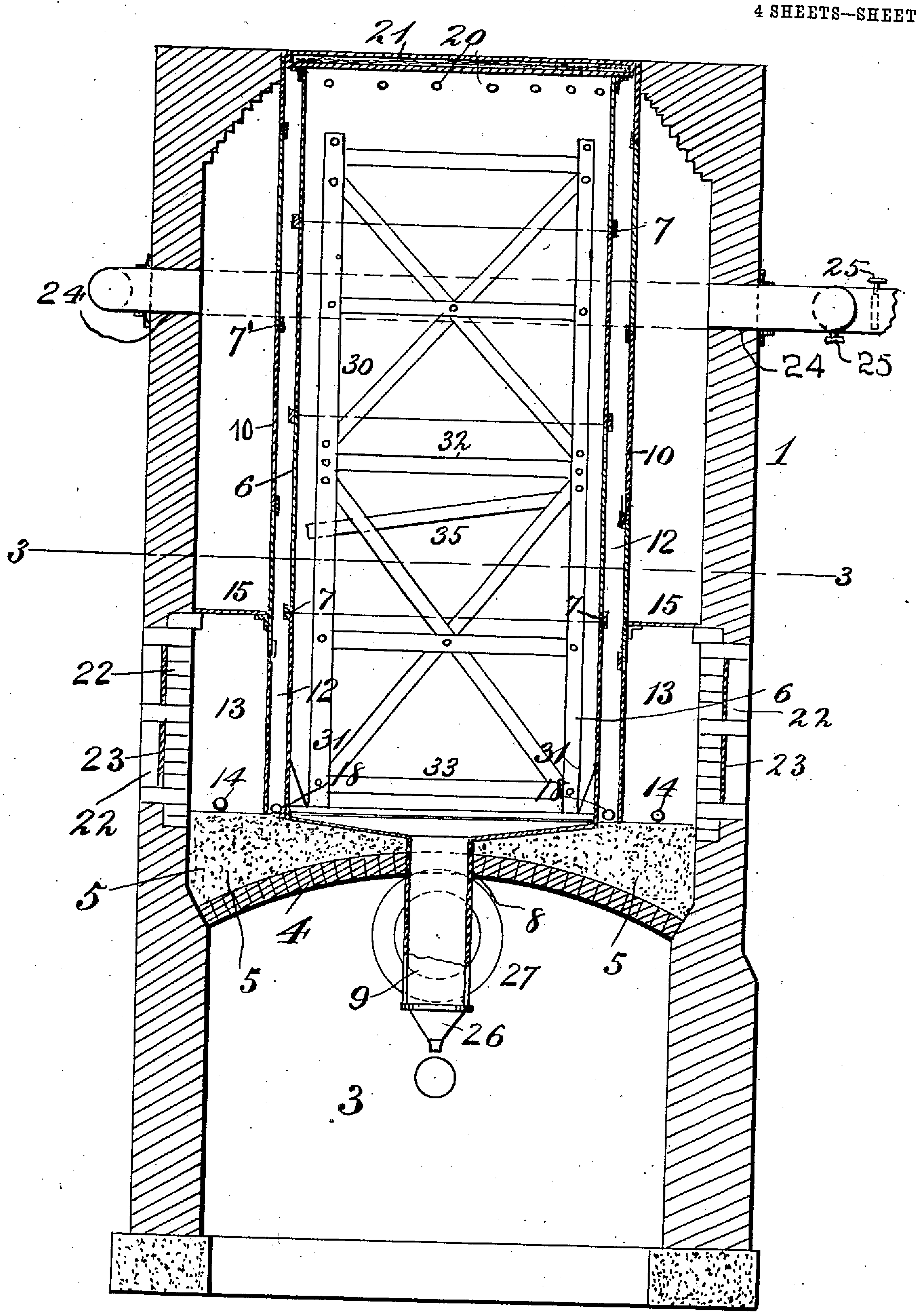

Fig. 2.

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4 SHEETS—SHEET 3.

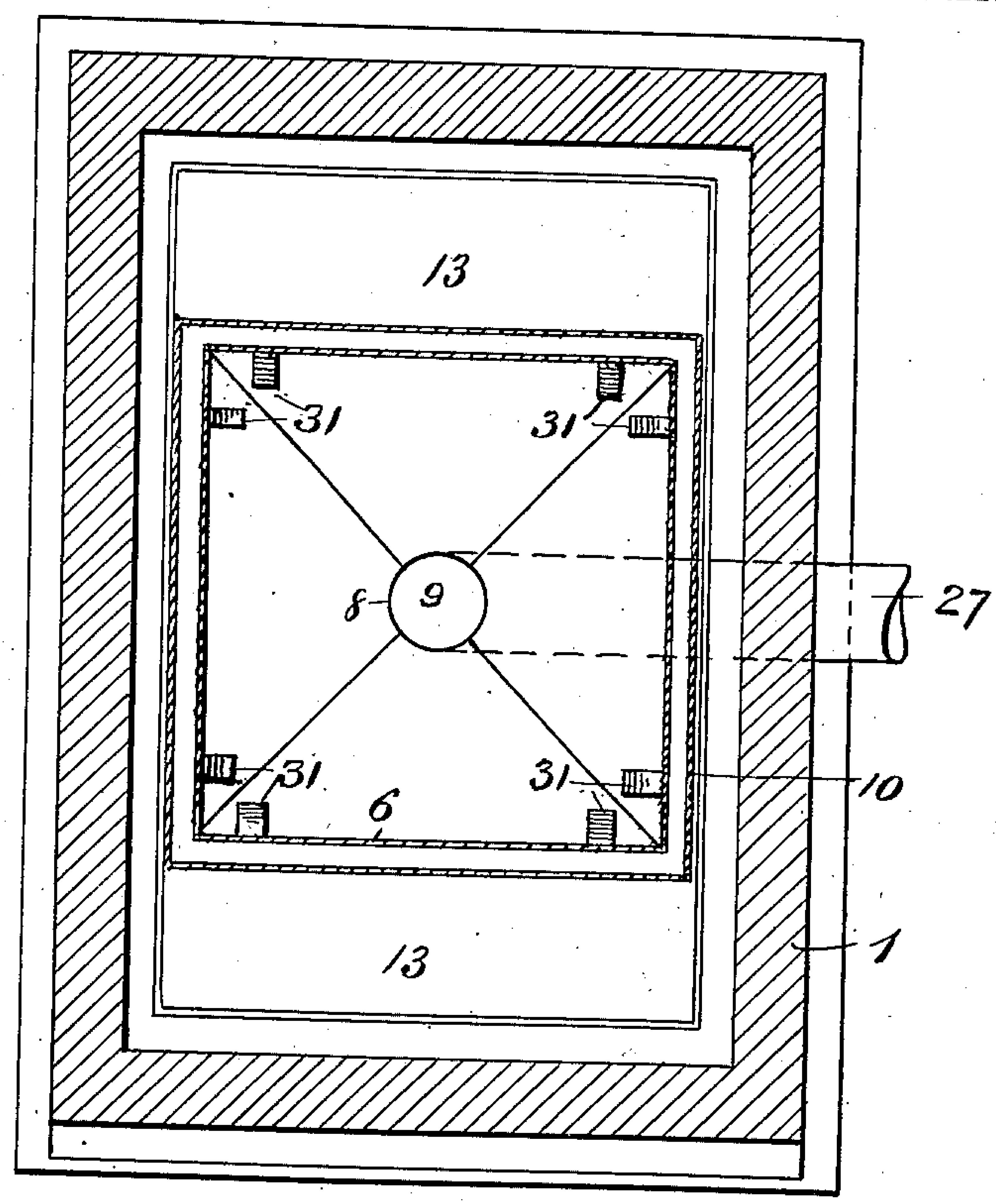

Fig. 3.

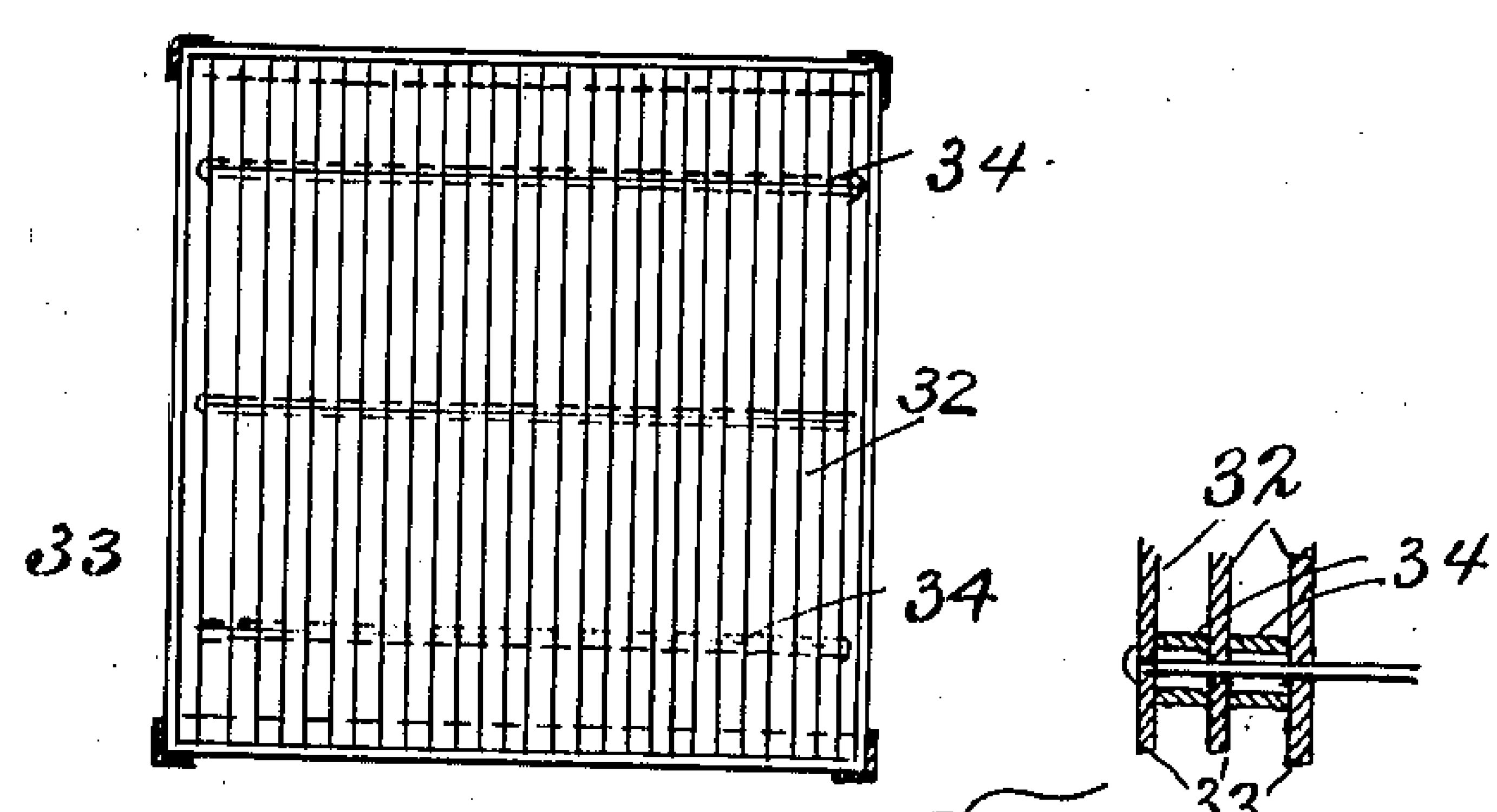

Fig. 6

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4 SHEETS—SHEET 4.

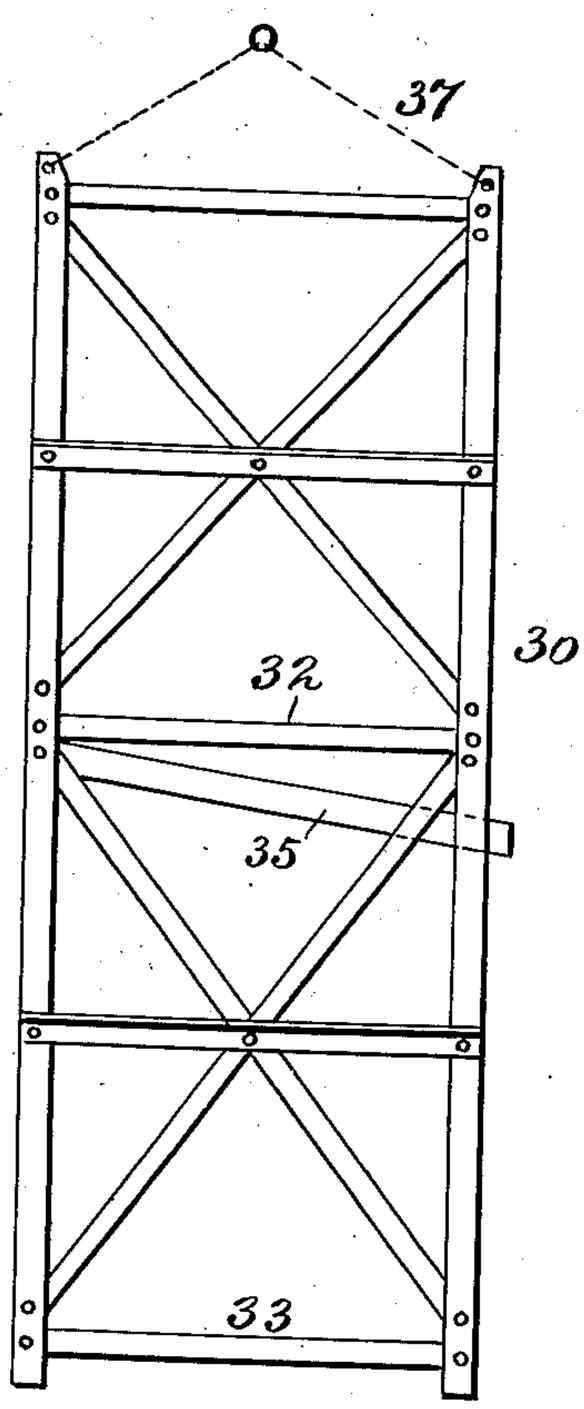

Fig. 4.

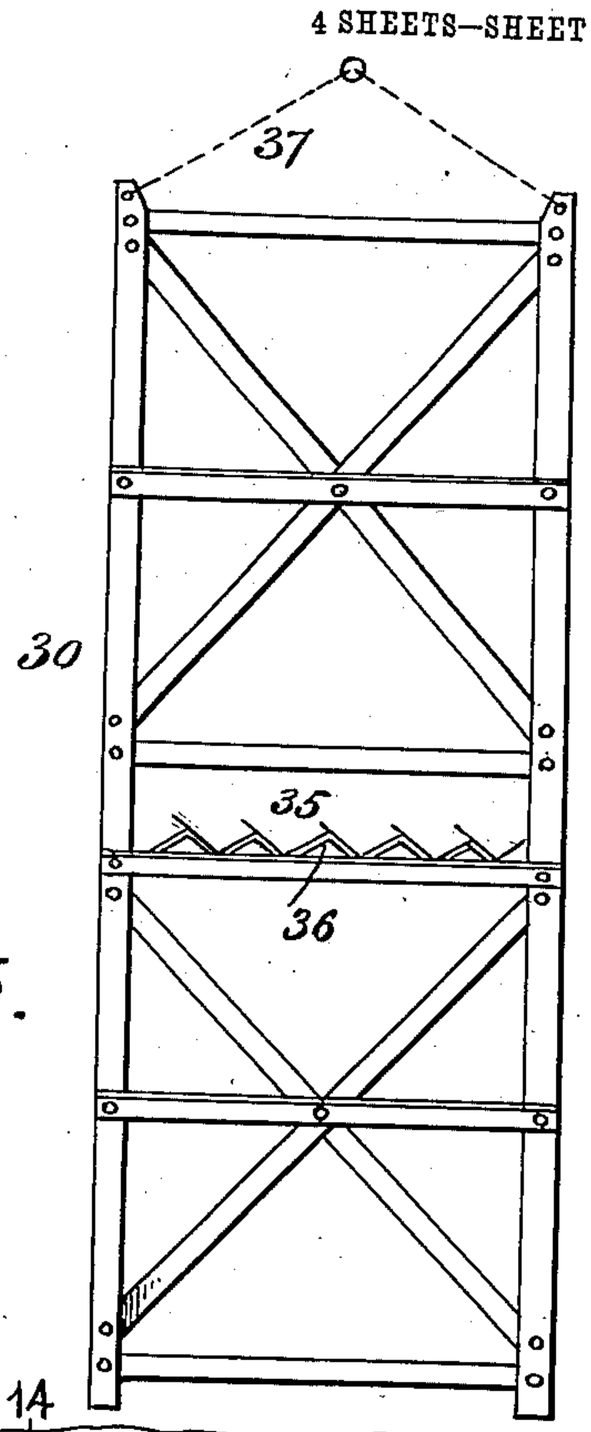

Fig. 5.

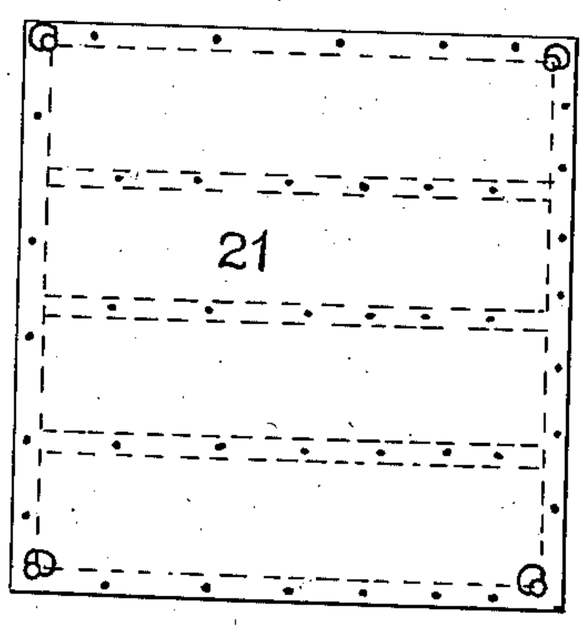

Fig. 7.

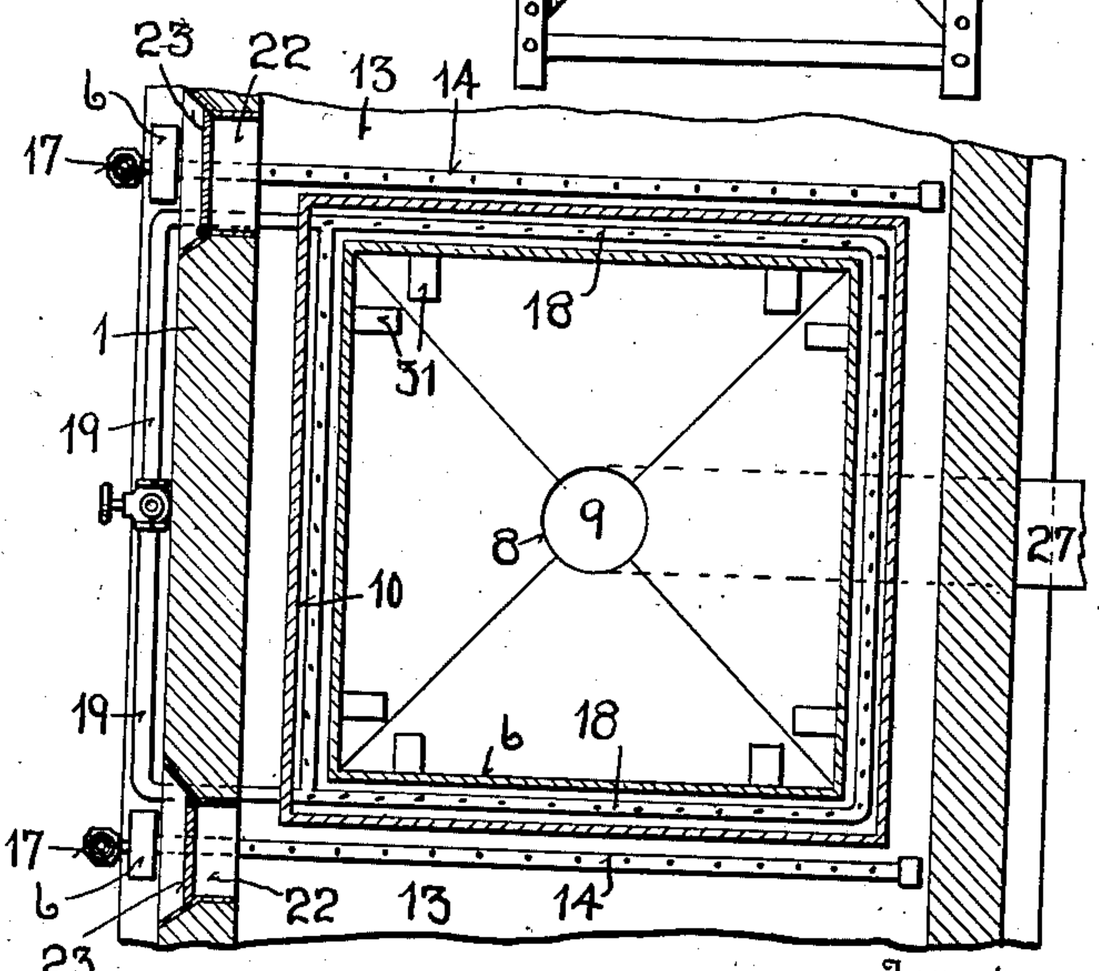

Fig. 8.

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UNITED STATES PATENT OFFICE.

EDMUND G. JEWETT, OF BELLINGHAM, WASHINGTON.

WOOD-DISTILLING APPARATUS.

No. 863,718. Specification of Letters Patent. Patented Aug. 20, 1907.

Application filed May 24, 1906. Serial No. 318,483.

To all whom it may concern:

Be it known that I, EDMUND G. JEWETT, a citizen of the United States, residing at Bellingham, in the county of Whatcom and State of Washington, have invented certain new and useful Improvements in Wood-Distilling Apparatuses; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in wood distilling apparatus.

The object of the invention is to provide an apparatus of this character, in which wood may be distilled and the distillates and gases therefrom may be conducted from the retorts, separated and delivered to suitable receptacles, means being provided whereby the wood may be readily supplied to and removed from the retorts, and means whereby the wood is supported therein in position to be thoroughly acted on by the heat from the furnace.

With the above and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts, as will be hereinafter described and claimed.

In the accompanying drawings:—Figure 1 is a vertical sectional view through a furnace and retort constructed in accordance with the invention; Fig. 2 is a similar view, taken at right angles to Fig. 1, and showing a wood holding crate arranged therein; Fig. 3 is a horizontal sectional view on the line 3—3 of Fig. 1; Fig. 4 is a side view of one side of the wood holding crate removed from the retort; Fig. 5 is a vertical sectional view, taken on a plane at right angles to Fig. 4; Fig. 6 is a horizontal sectional view of the crate taken above the grated wood supporting partition arranged therein; and Fig. 7 is an enlarged detail sectional view of the retort cover. Fig. 8 represents a horizontal section taken on line 8—8 of Fig. 1.

Referring more particularly to the drawings, 1 denotes the furnace, which is preferably rectangular in horizontal cross section and constructed of masonry. The furnace 1 consists of an upper retort chamber 2, below which is formed a passage or compartment 3, said compartment 3 being separated from the chamber 2 by an arched ceiling 4, above which is arranged a bed of concrete 5. Arranged in the upper chamber 2 and resting on the concrete bed 5 is a retort 6, said retort being preferably rectangular in shape and formed of a series of sheet metal plates, the joints of which are covered on their outer sides by strips 7, to which the meeting edges of the plates are bolted. The lower end of the retort 6 is inclined from the sides of the retort toward the center forming an inclined bottom where a discharge opening 8 is formed, said opening communicating with a discharge pipe 9 said inclined bottom is preferably extended beyond the side walls of the retort and to the outer edge thereof is secured a fire screen 10, which is preferably formed of sheet metal and extends entirely around the retort, as shown. This shield may be made in sections and connected by strips 7′ similar to the strips 7 of the retort. Said fire screen is arranged a suitable distance from the outer sides of the retort to form a steam space 12. Between the fire screen 10 and the inner side of the furnace wall is formed a fire chamber or space 13, in the lower portion of which along two sides of the furnace are arranged elongated gas burners 14, which may be of the usual or any suitable construction. In the spaces or chambers 13 above the gas burners 14 are arranged suitably supported baffle plates 15 by means of which all of the heat from the gas burners is prevented from passing upwardly in the chambers or spaces above the gas pipe, some of said heat being deflected by said plates around the fire screen into the spaces at the sides thereof in which there are no gas burners, thereby providing for an even distribution of heat from said burners when passing upwardly in the spaces between the screen and the inner sides of the furnace wall, as will be understood. The gas burners 14 are connected to suitable supply pipes 16 arranged at one side of the furnace, said pipes being provided with a cutoff valve 17 by which the flow of gas to the burners is controlled.

At the lower end of the space 12 around the retort 6 is disposed a perforated steam discharge pipe 18, said discharge pipe being connected with a suitable supply pipe 19 arranged out side the furnace, as shown. The steam discharged from the steam discharge pipe 18 passes upwardly in the space between the retort and the fire screen and enters steam passages or openings 20 formed in the side of the retort adjacent to its upper end. The steam in passing up the passages 12 will be superheated by coming into contact with the hot fire screen, so that said steam enters the retort through the passages 20 heated to an extremely high temperature.

The upper open end of the retort 6 is adapted to be closed by a cover 21, said cover being preferably in the form of a hollow metal box constructed as clearly shown in Fig. 7 of the drawings, and to be filled or packed with asbestos. In the walls of the furnace adjacent to the spaces containing the gas burner are formed clean out openings 22, adapted to be closed by iron doors 23. In the upper portion of the side walls having the clean out openings are formed draft openings 24, in which are arranged thimbles having dampers 25, by means of which draft and ventilation of the furnace may be controlled.

In the lower end of the discharge pipe 9 is arranged a funnel 26, by means of which the distillates passing through the discharge pipe 9 is discharged into a suitable receptacle or conduit, not shown. Connected to the pipe 9 above the funnel 26 is a gas conduit 27, which

extends through the side of the compartment 3 and is closed at its outer ends by a plug 28. Connected to the pipe 27 adjacent to the closed end are one or more upwardly projecting gas discharge pipes 29, by means of which the gases from the retort are conducted to a suitable place of discharge.

Adapted to be placed in the retort 6 is a wood holding crate 30, which is here shown as preferably constructed of angle iron strips and braces to form a rectangular receptacle somewhat smaller than the diameter of the retort, said crate being adapted to be let down into the retort through the upper end of the same. The crate when let down into the retort is centered therein by means of inclined guide bars 31, arranged on the inner sides of the retort adjacent to each corner thereof, as shown. By providing the guide bars 31 an equal space will be formed between each side of the crate and the adjacent sides of the retort. Substantially midway between the upper and lower ends of the crate is arranged a partition 32 which separates said crate into two parts, in each of which is adapted to be placed the wood to be treated, the pieces of wood being stood on end on said partition and the bottom of the crate. The partition 32 and the bottom of the crate are preferably formed of a series of horizontally-disposed metal bars 33, which are connected together by tie rods or bolts. The bars 33 are spaced apart by sections of gas pipe forming sleeves 34, through which and the bars 33, said tie rods are adapted to pass.

Immediately below the partition 32 is arranged a series of inclined troughs 35, the edges of which overlap as shown in Fig. 5 of the drawings, said troughs being held in position by straps 36 bolted or otherwise fastened to the cross bars of the crate, as shown in Fig. 4. By means of the troughs 35, the distillate from the wood in the upper section of the crate is caught and conveyed to one side of the crate, where the same is discharged and falls onto the inclined bottom of the retort which conducts the same and the distillates in the wood from the lower portion of the crate to the discharge pipe 9. If desired hoisting chains 37 may be connected at one end to the corner bars of the crate and at their opposite ends to a centrally-disposed ring to which is adapted to be connected a hoisting cable by means of which the crate may be readily placed in or removed from the retort.

The bottom as well as the partition of the crate 30 is composed of metal bars 33, connected by tie rods, and the crate being of skeleton or open form the wood may be placed in the lower compartment through the openings in the crate.

By means of an apparatus constructed as herein shown and described such products as alcohol, tar, turpentine and other distillates may be obtained from the wood and the gases eliminated or removed therefrom.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention, as defined by the appended claims.

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

1. In a wood distilling apparatus, a retort, means for closing said retort, a wood holding crate adapted to be removably disposed in said retort, said crate comprising an open frame having a transversely disposed slatted partition, and troughs arranged below said partition.

2. In a wood distilling apparatus, a retort having arranged near its upper end a series of steam inlet passages, a cover to close said retort, a wood holding crate arranged therein, steam discharge pipes arranged near the lower end of the retort and means whereby the steam of said pipe is superheated before passing into the steam inlet passages at the upper end of the retort, substantially as described.

3. In a wood distilling apparatus, a retort having arranged near its upper end a series of steam inlet passages, a hollow, packed cover adapted to close the upper end of said retort, a crate arranged in the latter, perforated steam discharge pipes, means whereby the steam in said pipes is superheated before entering the steam inlet passages in said retort, a discharge pipe arranged in the lower end of the retort, a gas conduit connected to said discharge pipe, and gas discharge pipes connected to said conduits, substantially as described.

4. In a wood distilling apparatus, a furnace, a retort in said furnace, said retort having steam inlet openings near its upper ends, a fire screen arranged around said retort and spaced therefrom, a perforated steam discharge pipe arranged in the space between said fire screen and the side of said retort, the steam from said pipe being adapted to pass upwardly through said space and to enter the retort through the inlet openings therein, said steam being superheated by contact with said fire screen, substantially as described.

5. In a wood distilling apparatus, a furnace, a retort arranged in said furnace, said retort having steam inlet passages near its upper end, a fire screen arranged around said retort and spaced therefrom, steam discharge pipes arranged in the space between said retort and fire screen, gas burners arranged in the space between said fire screen and the inner side of the furnace walls along two sides of the latter, baffle plates arranged above said burners to distribute the heat to the spaces between the other side of the furnace and the retort, and a wood holding crate arranged in said retort, substantially as described.

6. In a wood distilling apparatus, a furnace comprising a retort chamber arranged above an open compartment or passage, a fire screen arranged in said upper chamber of the furnace and spaced from the inner side walls thereof, a retort arranged within said fire screen and spaced therefrom, said retort having formed near its upper end steam inlet passages, a removable cover arranged on said retort, perforated steam supply pipes arranged in the lower end of the space between said fire screen and retort, means whereby heat is generated in the spaces between two opposite sides of the furnace wall and said fire screen, baffle plates arranged in said spaces to direct the heat to the spaces in the other sides of the furnace wall and fire screen, a discharge pipe arranged in the inclined bottom of said retort, a gas conduit connected to said discharge pipe, a crate adapted to be inserted in said retort, a slatted partition arranged in said crate to separate the latter into upper and lower wood holding spaces, and means whereby the products of distillation are discharged from the wood in said upper space onto the inclined bottom of said retort, substantially as described.

7. In a wood distilling apparatus, a retort having a removable cover, means whereby steam is let into said closed retort, means to superheat said steam, a wood holding crate adapted to be placed in said retort, said crate comprising an open, rectangular frame, a slatted partition arranged in said frame to separate the crate into upper and lower wood holding spaces, and troughs arranged below said partition, whereby the products of distillation from the wood in said upper space is discharged onto the bottom of said retort, substantially as described.

8. In a wood distilling apparatus, a furnace, a fire

screen arranged in said furnace, a retort arranged in said fire screen, means whereby steam is discharged into said retort, means to superheat said steam, an inclined bottom formed in said retort, a discharge pipe arranged in said bottom, a wood holding crate adapted to be inserted into said retort, means to center said crate within the retort, a slatted bottom and a slatted partition arranged in said crate, said partition separating the same into upper and lower wood holding spaces, a series of inclined troughs arranged below said partition, the edges of said troughs being adapted to overlap, hoisting cables connected to the upper end of said crate, clean-out doors arranged in the walls of said furnace, ventilating thimbles arranged in the walls of and near the upper end of the latter, and draft dampers arranged in said thimbles, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

EDMUND G. JEWETT.

Witnesses:

L. L. CROSBY,

HERBERT D. COOLEY.