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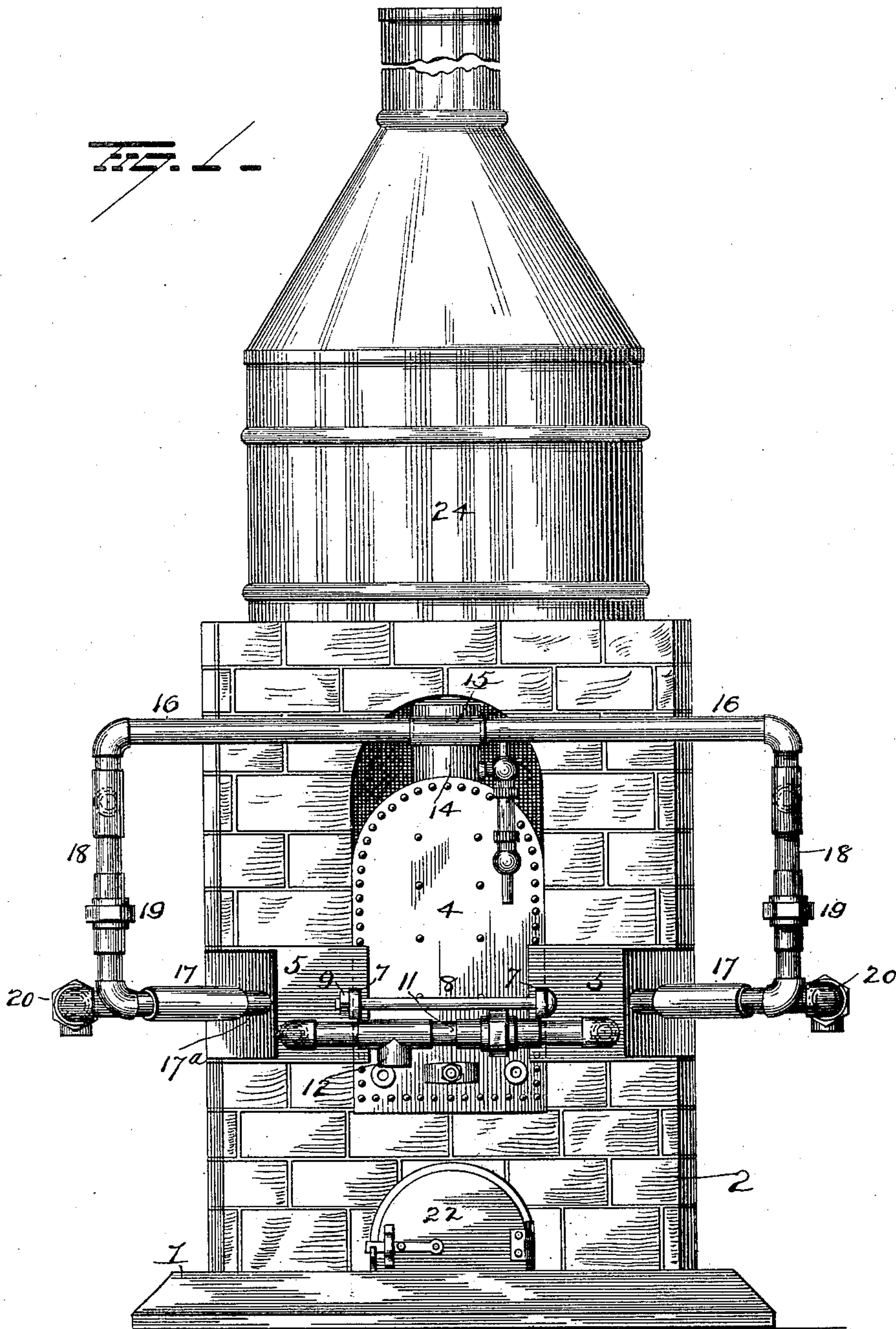
Patented Feb. 18, 1902.

W. GLEASON.
LIMEKILN.

(Application filed May 4, 1901.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES

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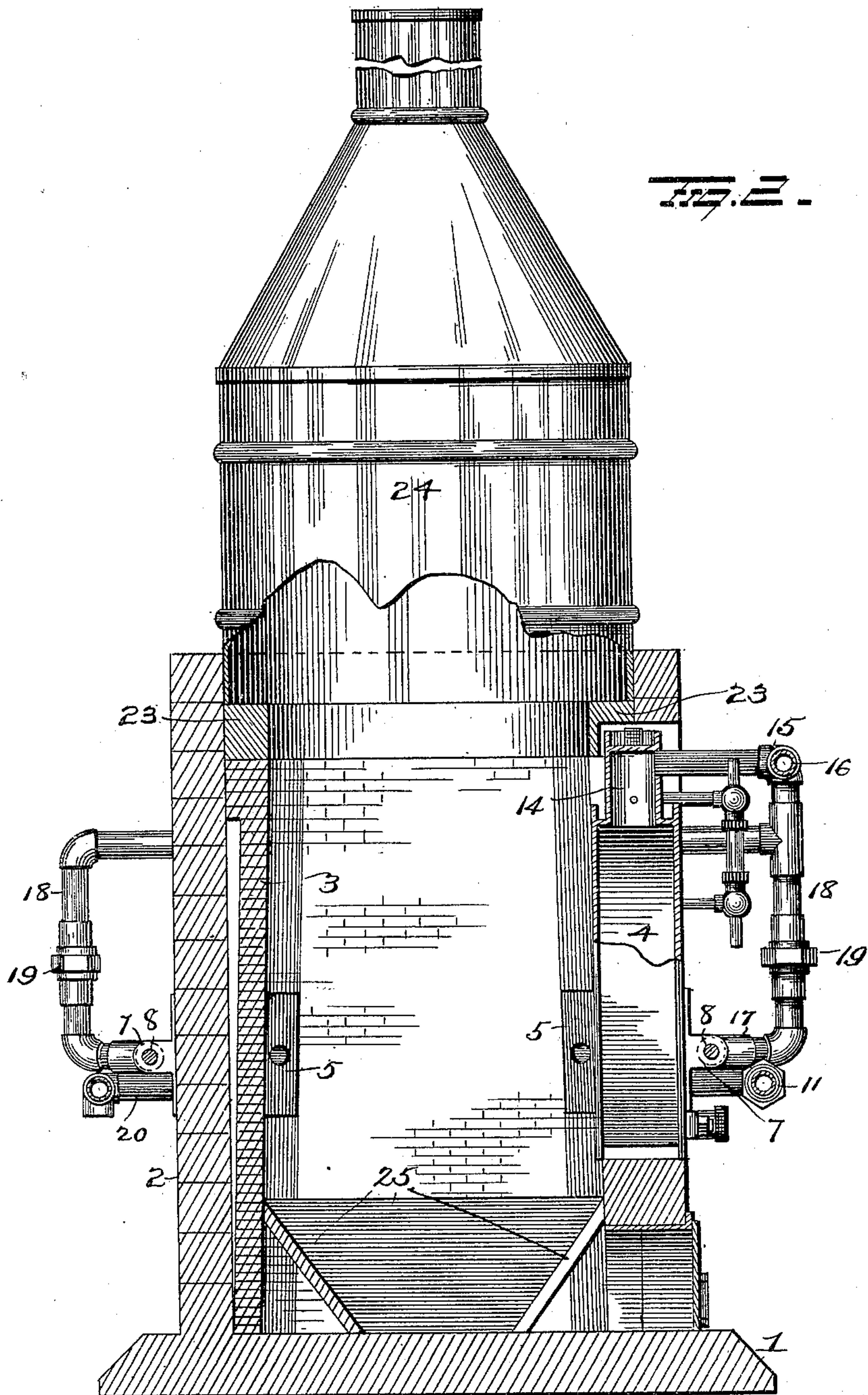
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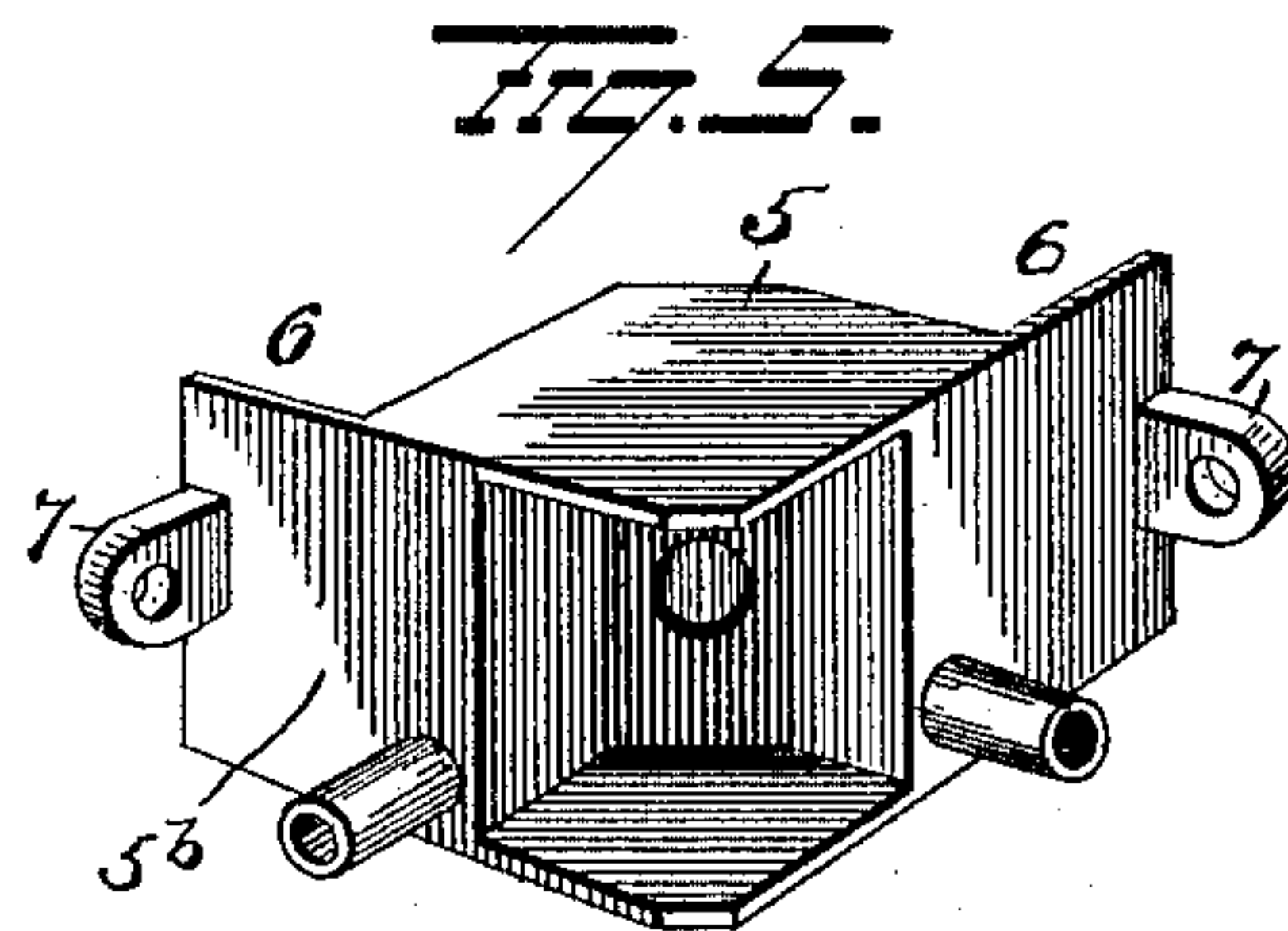
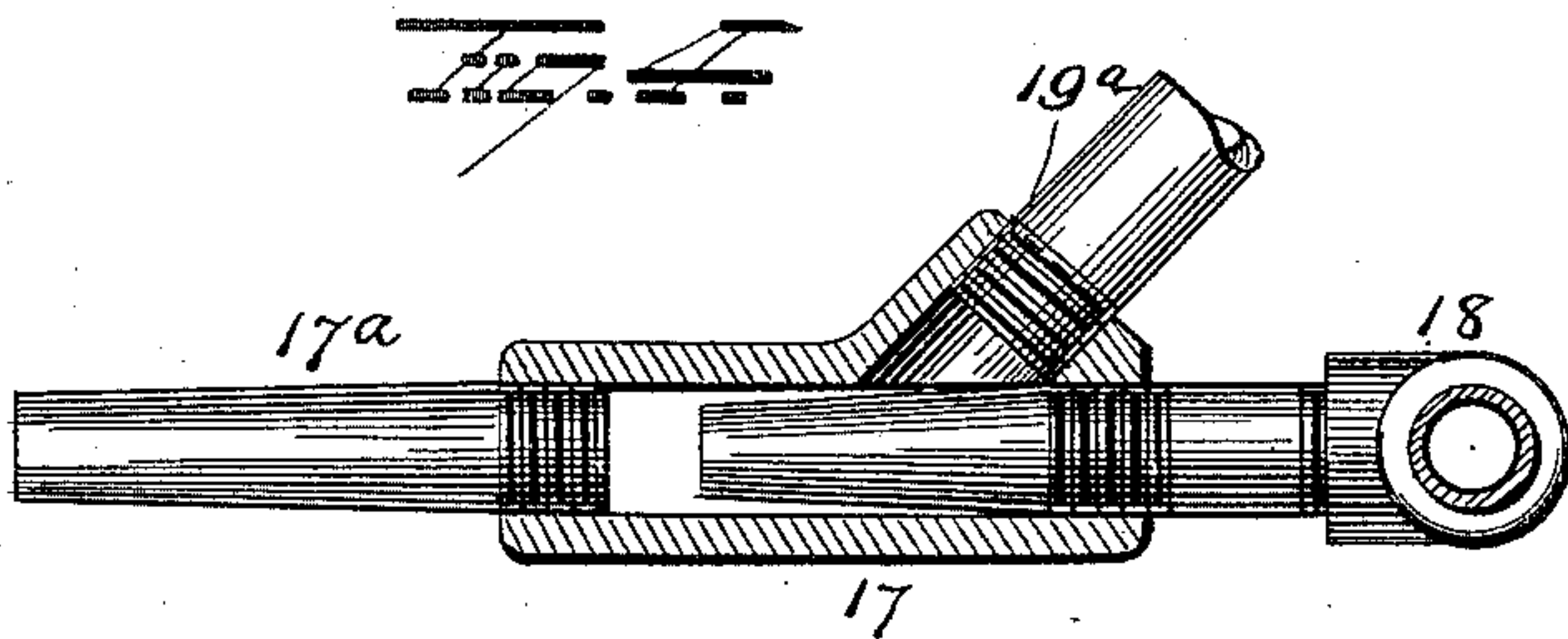
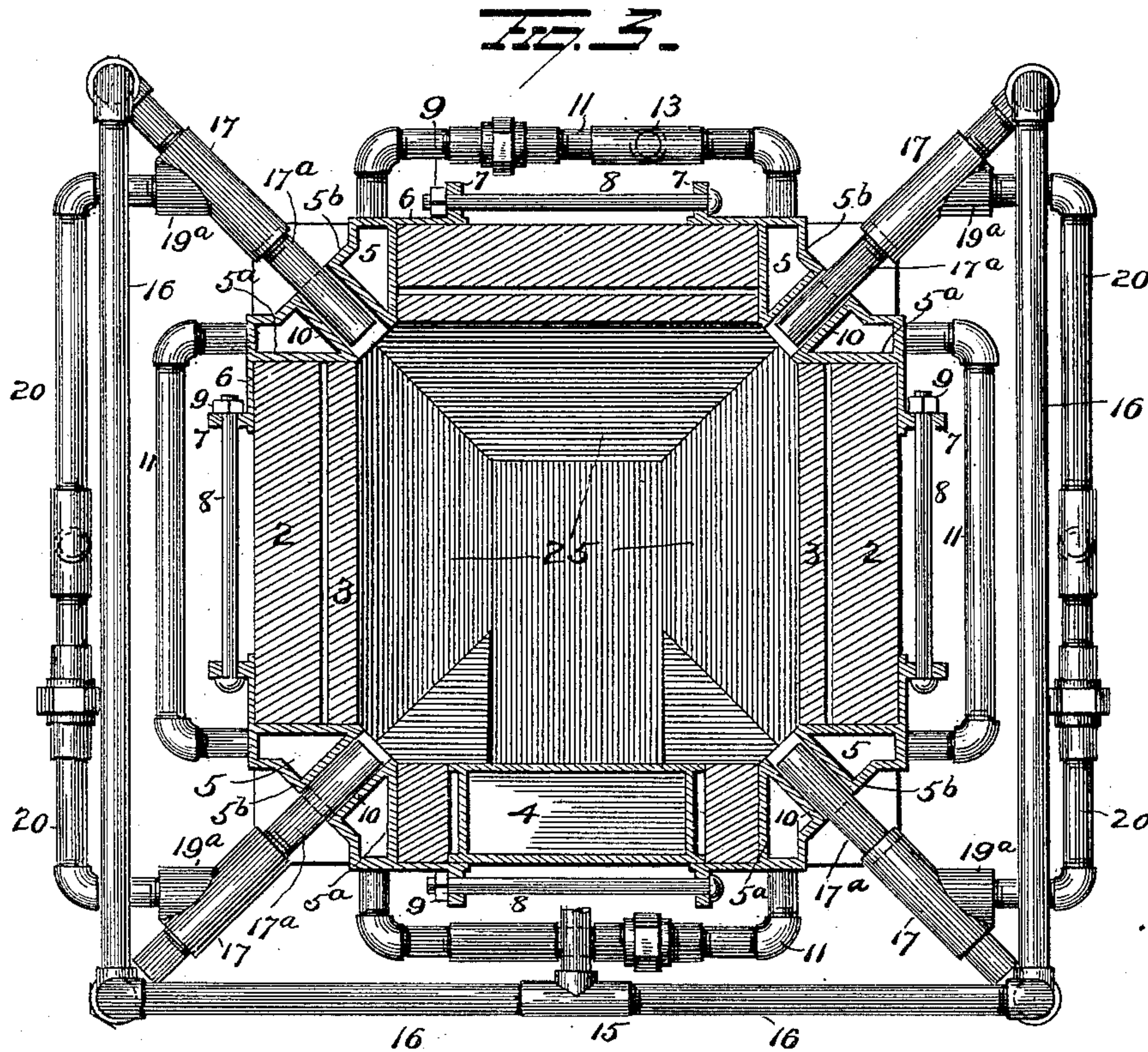
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UNITED STATES PATENT OFFICE.

WILLIAM GLEASON, OF SOUTH GLENS FALLS, NEW YORK.

LIMEKILN.

SPECIFICATION forming part of Letters Patent No. 693,599, dated February 18, 1902.

Application filed May 4, 1901. Serial No. 58,768. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM GLEASON, a resident of South Glens Falls, in the county of Saratoga and State of New York, have invented certain new and useful Improvements in Limekilns; and I do hereby 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.

My invention relates to an improvement in limekilns, an object of the invention being to provide an improved kiln of this character in which oil will be injected into the same by steam and burned therein.

A further object is to provide an oil-burning kiln with improved water-lined burner-tubes.

A further object is to provide a limekiln into which oil will be injected by steam into all sides thereof to completely burn all the contents thereof.

A further object is to provide an improved limekiln which will be simple in construction, comparatively cheap to manufacture and operate, and which will most effectually and rapidly burn all of the rock.

With these objects in view the invention consists in certain novel features of construction and combinations and arrangements of parts, as will be more fully hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view illustrating my improvements. Fig. 2 is a view in longitudinal section of the same. Fig. 3 is a view in section taken at right angles to Fig. 2, and Figs. 4 and 5 are views of details of construction.

1 represents the base or foundation of the kiln, which is composed of brick or masonry and has built thereon the approximately rectangular body 2, composed of outer or main walls of stone and inner walls or coatings of fire-brick 3. The front wall of the kiln is provided with an arched opening to receive therein a boiler 4, hereinafter referred to.

A suitable draw-hole and door 22 therefor are provided in the front wall of the kiln, at the bottom thereof, for the removal of lime, and I preferably employ in front of this door a suitable screen (not shown) over which the lime must be drawn to sift the same simul-

taneously with its removal from the kiln. The upper end of the kiln is made with an internal support for the removable cap-ring 23, on which is supported the approximately conical metal combustion-chamber and smoke-stack 24, and the bottom of the kiln is made with inclined sides and rear end to form a hopper or trough and direct the burnt lime to the center, where it can be readily removed through the draw-hole.

Pockets are formed in all four corners of the kiln, between its ends, for the reception of water-boxes 5, which are composed, preferably, of metal and comprise top and bottom plates, a rear plate 5^a, conforming in shape to that of the pocket and projecting across the opening in the inner wall of the kiln, and an outer plate 5^b, approximately parallel with the inner plate. The boxes 5 are provided on their side edges with flanges 6, overlapping the walls of the kiln, and said flanged portions are made with perforated lugs 7 to receive rods 8, headed at one end and screw-threaded at their other ends for the reception of nuts 9 to secure the boxes in the pockets. The boxes 5 are provided with tubular central portions 10 and are connected in circuit by pipes 11, with one of which an inlet-pipe 12 communicates and is adapted to connect the boxes with a water-pump, reservoir, or other source of supply, so as to maintain a supply of cold water to the boxes, and a suitable outlet-pipe 13 communicates with one of the pipes 11 to carry off the water and make room for the incoming fresh supply and maintain the tubes 10 at all times cool.

The boiler 4, above referred to, is constructed to fit into the arched opening in the front wall of the kiln and is made in any desired manner and of a strength in excess of that required to insure safety, and the dome 14 of the boiler is connected by a T-coupling 15 with pipes 16 and the latter with injectors 17, having burner-tubes 17^a, projecting into the tubular portions 10 of boxes 5 by short pipes 18, having suitable couplings 19 to permit the disconnection of the parts when desired. The ends of pipes 16 where they terminate in the injectors project beyond oil-inlets 19^a and are contracted to eject the steam in a small stream and inject the oil through burner-tubes 17^a into the kiln. The oil-inlets are disposed at

an angle to the steam-pipes, and oil is supplied thereto by pipes 20, connected with any suitable oil reservoir or pump, (not shown,) and suitable valves are provided in said pipes to regulate the feed to the injectors.

The operation of my improvements is as follows: The boiler 5 is heated by the intense heat of the kiln to make steam, which latter is conveyed to the injectors 17 by pipes 16 and 18, and the oil is conveyed to the injectors 17 by the pipes 20, as above explained, and is forced into the kiln by the steam and burned in all four corners thereof. The water-boxes 4 being maintained cool by the constant supply of cold water maintains the burner-tubes 17^a cool and prevents any damage thereto by the intense heat of the kiln, thereby lengthening the life of the tubes for an indefinite period and insuring the perfect operation of the burners.

By locating the burners in all four corners of the kiln I am enabled to burn all the rock and remedy a defect which has existed in kilns of this character heretofore known, wherein the corners were the most dormant part thereof and in which it was extremely difficult, if not quite impossible, to burn all the rock, an unnecessary amount of fuel being expended in order to get a small quantity into the corners. With my improvements every part of the kiln is maintained at an intense heat, and by distributing the burners as I have I am enabled to economize fuel and to obtain better results than heretofore.

If desired, the water after passing through the boxes 4 and becoming heated by its close contact with the kiln may be utilized as feed-water for the boiler and may be returned to the boxes after being cooled in the event of the failure for any reason of the main water-supply. In fact, by constructing a kiln as above described the water, oil, and steam can be most economically employed by various slight changes, which would readily suggest themselves, according to the location of the kiln and the facilities for operating the same, and various changes might be made in the general form and arrangement of the several parts described without departing from the spirit and scope of my invention, and hence I do not wish to limit myself to the precise details set forth, but consider myself at liberty to make such slight changes and alterations as fairly fall within the spirit and scope of my invention.

Having fully described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

1. The combination with an angular kiln having a series of radial openings in its corners, a series of injectors projecting into said openings so as to all discharge toward the center of the kiln and means for supplying oil and steam to said injectors.

2. The combination with an angular kiln, of burner-tubes projecting radially through the corners of the kiln, a steam-pipe communicating with each burner-tube and an oil-supply pipe arranged to discharge in rear of the outlet of the steam-pipe and enter the burner-tube with the steam.

3. The combination with an angular kiln having radial openings in its corners, of injectors entering said radial openings, means for supplying oil to the injectors, a boiler located in one wall of the kiln and heated thereby and steam-pipes connecting the boiler and injectors.

4. The combination with a kiln, of a water-jacketed burner-tube in said kiln, means for permitting a continuous flow of water through the jacket, and means for supplying oil to the burner.

5. The combination with an angular kiln, of water-boxes in the corners thereof, supply and escape pipes connecting said boxes, and burner-tubes projecting through said boxes.

6. The combination with an angular kiln, of water-boxes in the corners thereof, supply and escape pipes connecting said boxes, injectors, burner-tubes communicating with the injectors and projecting through the water-boxes, and oil-supply devices for said injectors, a boiler in the wall of the kiln and steam connection between the boiler and injectors.

7. In a kiln, the combination with an outer wall of stone, and an inner wall of fire-brick terminating near the top of the stone wall, of a cap-ring on the top of the brick wall, an approximately conical combustion-chamber and smoke-stack on said ring, a trough-shaped bottom in said kiln and a draw-hole door in the front of the kiln at the bottom thereof to permit the removal of the lime.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WILLIAM GLEASON.

Witnesses:

W. H. SCOTT,
GERTRUDE M. CALLEN.