

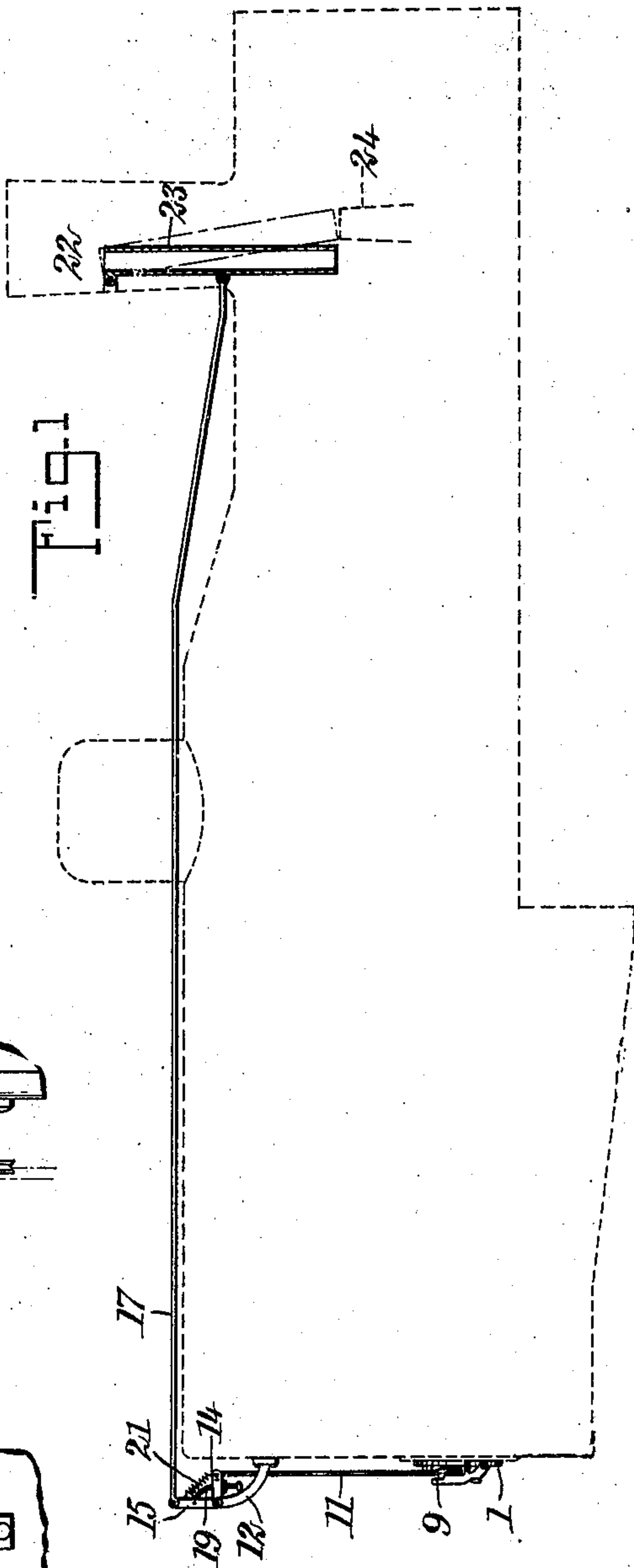
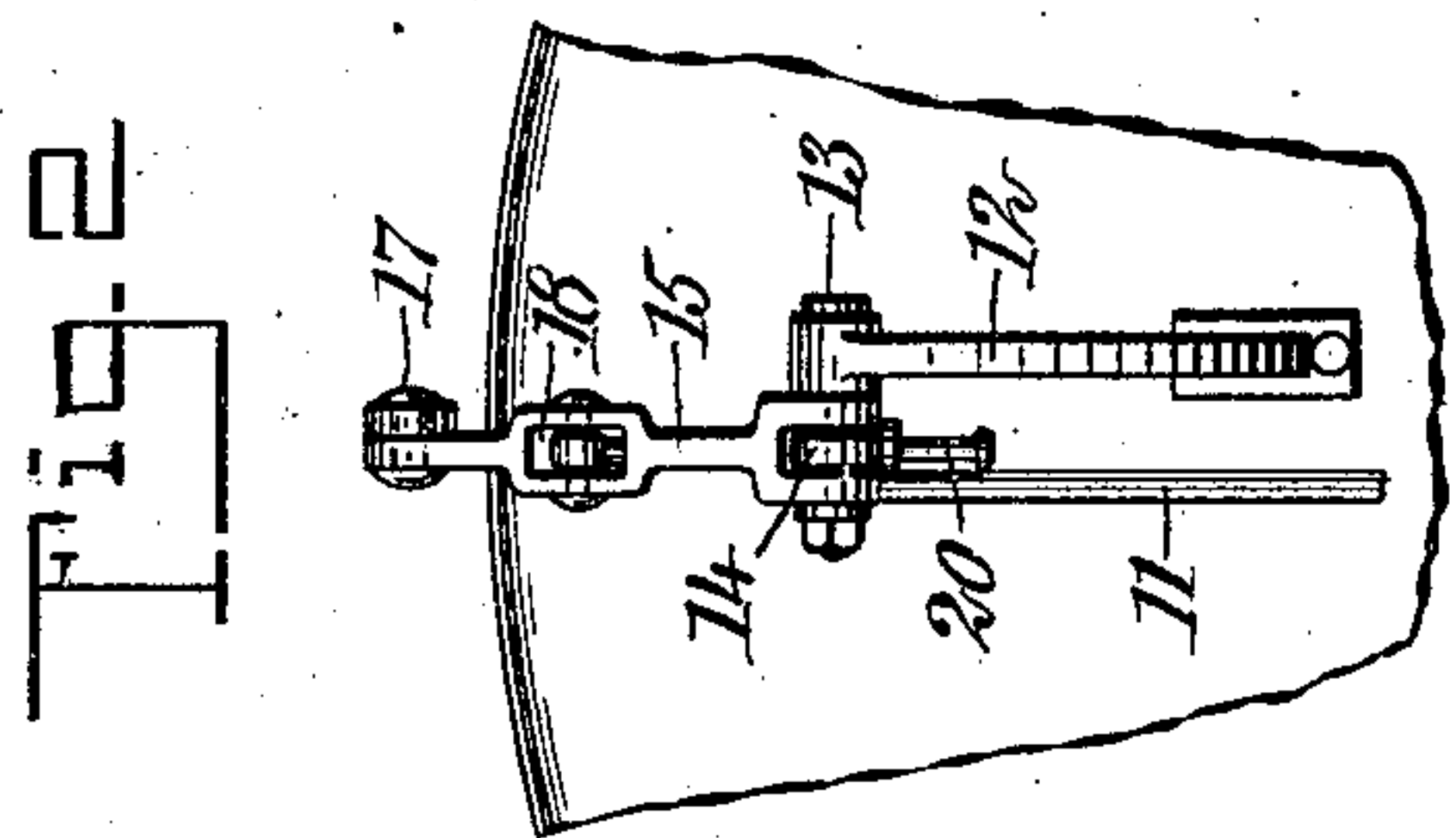
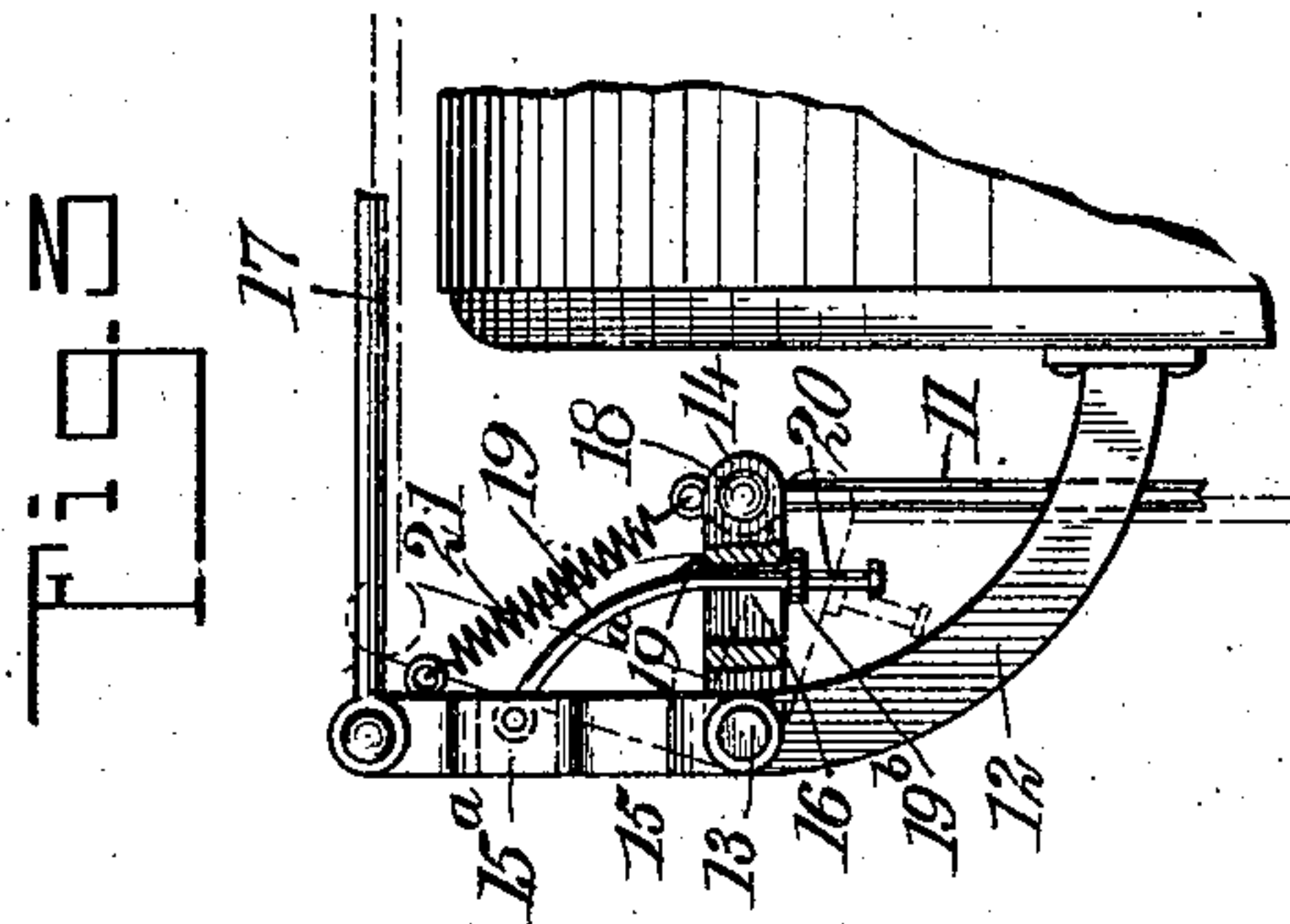
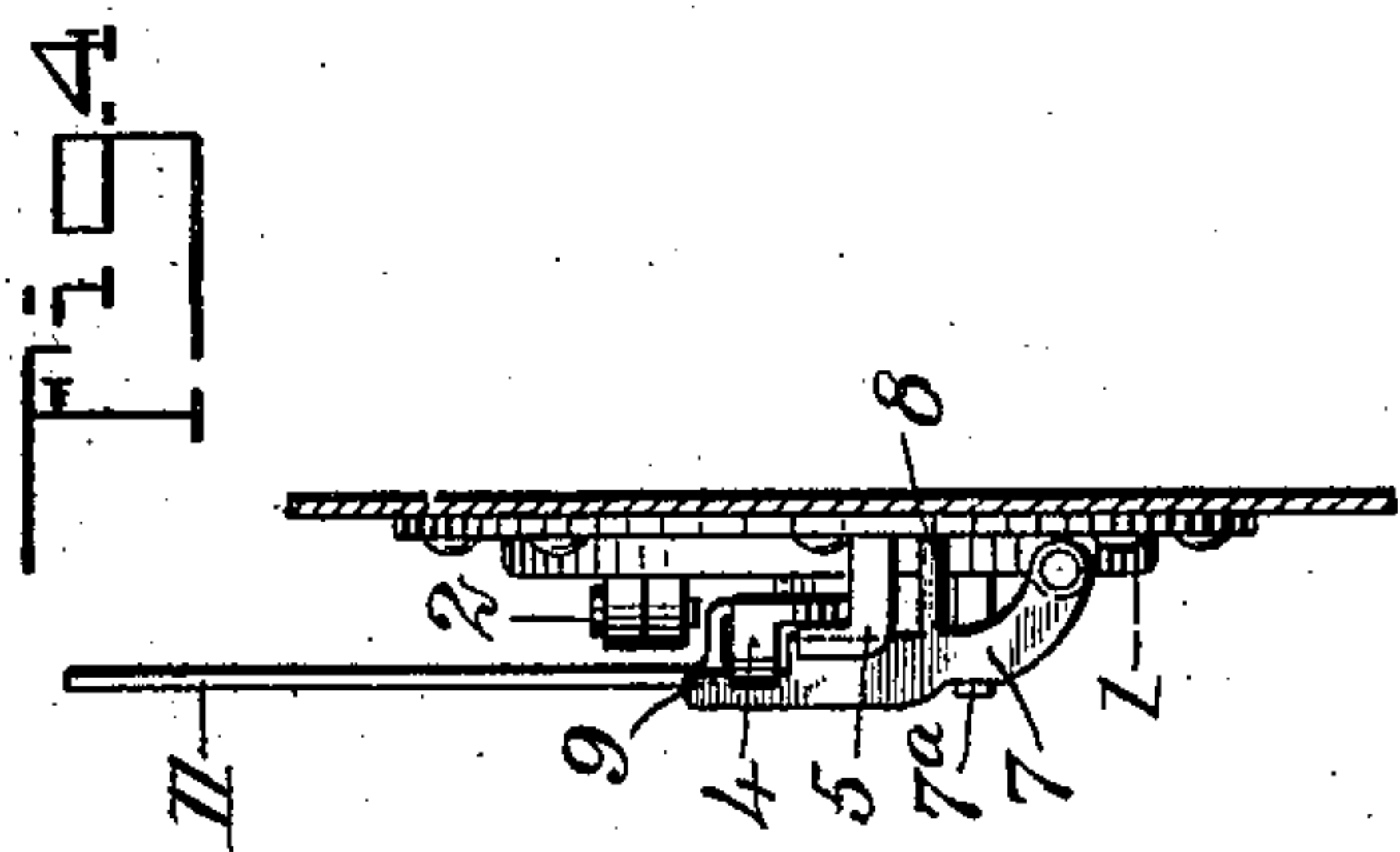
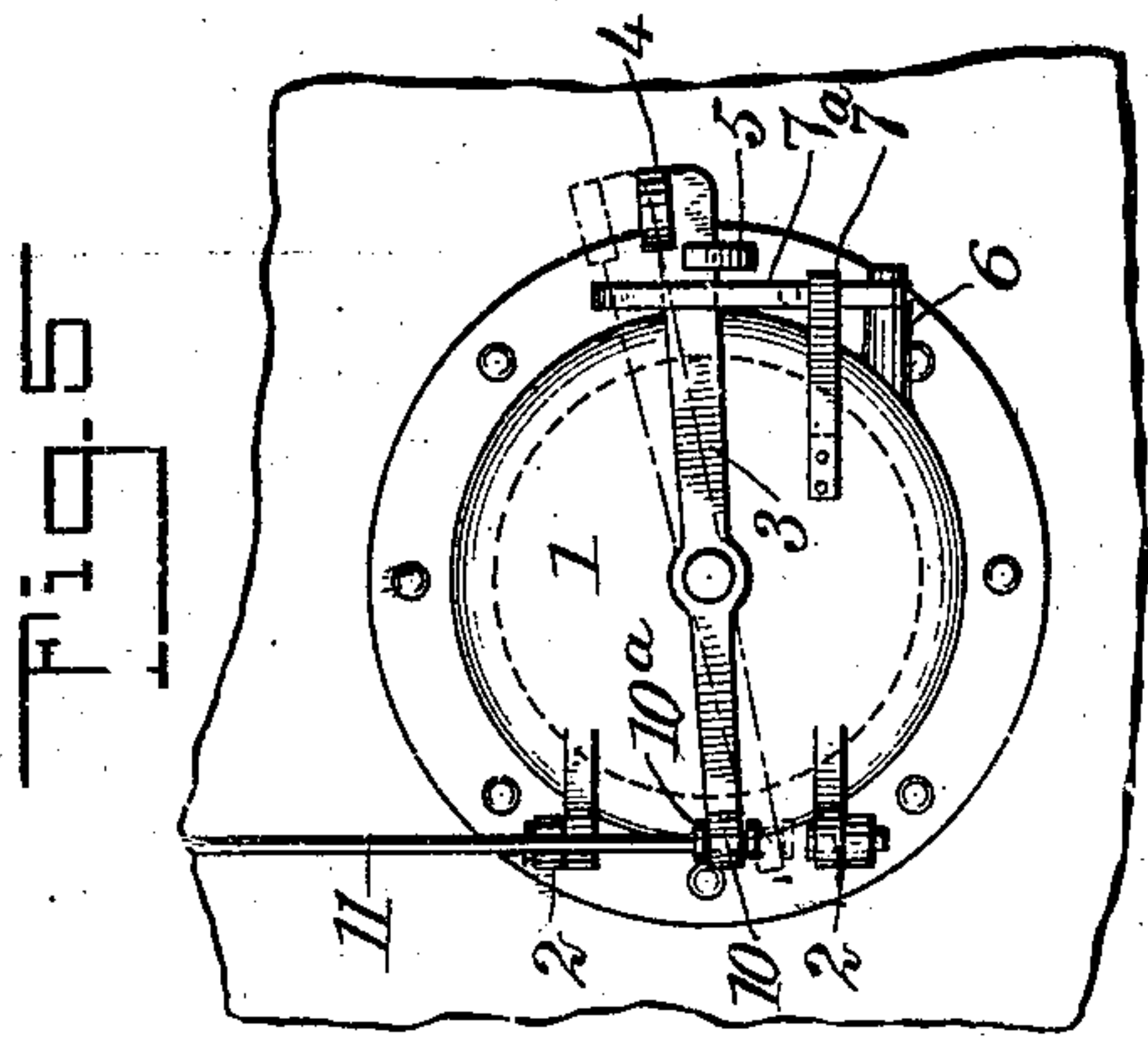
No. 847,209.

PATENTED MAR. 12, 1907.

A. J. SNOW.

DRAFT REGULATOR FOR STEAM BOILERS.

APPLICATION FILED APR. 3, 1906.



WITNESSES

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DRAFT-REGULATOR FOR STEAM-BOILERS.

No. 847,209.

Specification of Letters Patent.

Patented March 12, 1907.

Application filed April 3, 1906. Serial No. 309,595.

To all whom it may concern:

Be it known that I, ALONZO J. SNOW, a citizen of the United States, and a resident of Fromberg, in the county of Carbon and State of Montana, have invented a new and Improved Draft-Regulator for Steam-Boilers, of which the following is a full, clear, and exact description.

This invention is an improvement in draft-regulators for steam-boilers, more especially boilers for locomotives or the like, and has for an object, among others, to provide automatic means to prevent the suction of cold air by the exhaust of the engine through the fire-box and boiler-flues when the fire-box door is for any purpose open.

It is well known by those skilled in the art of locomotive construction that the exhaust of an engine is discharged through the exhaust-pipe at the forward end of the boiler, just under the engine smoke-stack. This construction, when the engine is exhausting, causes a forced draft through the fire-box and boiler-flues, making the fire burn faster and the engine steam better when the fire-box door is closed. When this door is open, the suction of the exhaust draws cold air through the box and flues, cooling the fire and boiler and causing a straining of the boiler seams and flues, due to the contraction of the boiler-plates caused by the cooling.

With this invention the exhaust is employed as usual to cause a forced draft through the fire-box, but dispense with it automatically by the opening of the fire-box door or by hand when the engine is steaming too fast.

Generally stated, my invention comprises a pipe forming an extension for the exhaust-pipe, adapted to be projected over the exhaust-pipe automatically by the opening of the fire-box door or by hand, if desired, thereby conducting the exhaust to the outer atmosphere and avoiding the usual draft when the exhaust is discharged in the smoke-box. For a more particular description reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation, partly in section, of my improved draft-regulator as applied to a locomotive, the outline of the loco-

motive being shown in dotted lines. Fig. 2 is an end view of the lever mechanism employed intermediate the fire-box door and engine-stack. Fig. 3 is a side elevation of the same, partly in section. Fig. 4 is a side elevation of the fire-box door and connections, and Fig. 5 is a face view of the construction shown in Fig. 4.

The numeral 1 indicates an ordinary fire-box door, hinged at 2, a latch 3 being pivoted at the center of the fire-box door, having a weighted handle portion 4 engaging a hook 5 when the door is closed. Pivoted on a lug 6, extending from the door on the side opposite the hinges, is an arm 7, normally forced inwardly by a spring 7^a, said arm having a foot 8 to press against the fire-box sheet or casing and a notch 9 at its upper end to contain the end of the latch 3 when in inoperative position. The opposite end of the latch 3 is extended beyond its pivotal connection, terminating in an eye 10, substantially in alinement with the pivot-bolts of the hinges, and is coupled to a rod 11 through the eye 10 by means of enlargements 10^a on said rod.

Fixed to the upper end of the boiler-head is an outwardly and upwardly extending bracket 12, having an eye at its upper end for a pivot-bolt 13, which in turn supports levers 14 and 15, the former extending into a bifurcation of the latter. (See Fig. 2.) The lever 14 is provided substantially at its center with a vertical slot 16 and is connected by a pivot-bolt 18 at its outer end to the rod 11. The lever 15 is pivotally connected at its upper end to a rod 17 and has at or near its center a slot 15^a, in which is pivoted a curved arm 19, extending downwardly through the slot 16 in the lever 14 and terminating in a handle 20. The arm 19 is provided with shoulders 19^a and 19^b for rigidly connecting the levers 14 and 15 together at substantially right angles, the shoulder 19^b being adapted to be passed through the slot 16 when desired, for a purpose hereinafter made apparent. Said levers are normally forced together by a spring 21, connected to the outer end of each, as most clearly shown in Fig. 3.

To some convenient portion of the engine-stack is pivotally supported at 22 a pipe 23, pivotally connected near its center to the

rod 17 and adapted when moved to the dotted position shown in Fig. 1 to form an extension for an exhaust-pipe 24, (shown in dotted lines in Fig. 1,) said pipe 23 normally occupying the position shown in full lines in said figure.

In the operation of the regulator the parts occupy the position shown in full lines in Fig. 1. When the latch 3 is raised to open the door, the eye 10^a is lowered, pulling the rod 11 downward, rocking the rigidly-connected levers 14 and 15 on their pivot 13 and pushing the rod 17 forward, which carries the pipe 23 over the exhaust-pipe 24. At the same time the arm 7, by virtue of the spring 7^a, is forced inwardly and engages the latch with the notch 9 and holds it in the dotted position shown in Fig. 5 until the door is securely closed. It is thus apparent that by opening the fire-box door the exhaust is automatically piped to the outer atmosphere and does not act to draw cold air through the door-opening and cool down the fire and boiler.

When the door is closed, the foot 8 presses on the fire-box casing, pushing the arm 7 backward, thereby releasing the latch 3 from the notch 9, which, in view of the weighted end 4 of the latch and the manner in which the pipe 23 is suspended, returns the parts to the positions shown in Fig. 1. In case the engine is steaming too fast, instead of operating the engine-damper the handle 20 is drawn backward, disengaging the shoulder 19^b from the lever 14, which shoulder by the action of the spring 19 is forced through the slot 16, and at the same time said spring draws the lever 15 toward the lever 16, pushing the rod 17 and the pipe 23 to the same position as if the fire-box door were open. When the boiler is sufficiently cooled down, the handle 20 is raised to rigidly connect the levers together, as shown in Figs. 1 and 3.

It is not my intention to limit the invention to the exact details of construction herein described; but I consider that I am entitled to such modifications as fall within a fair interpretation of the claims.

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

1. In an engine, the combination with a fire-box door, of a latch pivoted to the door, an arm pivoted to the door and having a notch at its upper end for engaging the latch, a bracket, levers pivotally supported on the bracket and adapted to be rigidly connected together, a pipe pivoted to the engine-stack, and rods connecting the levers with the latch and pipe, whereby when the latch is lifted it is engaged with the notch and the pipe is projected over the engine's exhaust.

2. In an engine, the combination with a

fire-box door, of an extension for the exhaust-pipe, adapted to be swung into and out of alinement with the exhaust-pipe, a latch pivoted to the door, an arm pivoted to the door and having a foot, means for normally throwing the arm inwardly, and means intermediate the extension and latch whereby when the latter is raised the extension is projected into alinement with the exhaust-pipe.

3. In an engine, an extension for the exhaust-pipe adapted to be projected into and out of alinement therewith, a fire-box door, a latch for said door, a pair of levers supported on a pivot-bolt above the door, means for rigidly connecting the levers together and disconnecting them, and means connecting the levers with the extension and latch, whereby when the latch is raised the extension is projected into alinement with the exhaust-pipe.

4. In an engine, an extension for the exhaust-pipe adapted to be projected into and out of alinement therewith, a fire-box door, a weighted latch pivoted on the door, an arm pivoted to the door having a foot and a notch and normally forced inward by a spring, and means intermediate the door and extension, whereby when the latch is raised it engages the notch and the extension is carried in alinement with the exhaust-pipe, and when the door is closed the latch, by the action of the foot, is released and the parts returned to normal position.

5. In an engine, the combination with an exhaust-pipe, an extension movable into and out of alinement therewith, a fire-box door, means for fastening said door, and means intermediate of and connected to the extension and fastening means whereby as the latter is operated the extension is moved into and out of alinement with the exhaust-pipe.

6. In an engine, the combination with an exhaust-pipe, an extension movable into and out of alinement therewith, a fire-box door, a latch pivoted to the door, and means intermediate of and connected to the extension and latch whereby as the latter is operated the extension is moved into and out of alinement with the exhaust-pipe.

7. In an engine, the combination with an exhaust-pipe, an extension movable into and out of alinement therewith, a fire-box door, a latch pivotally mounted on said door, means intermediate of and connected to the extension and latch whereby as the latter is pulled upwardly the extension is moved into alinement with the exhaust-pipe, and means for holding the latch in an elevated position while the door is open.

8. In an engine, the combination with an exhaust-pipe, an extension movable into and out of alinement therewith, a fire-box door, a

latch pivotally mounted on said door, means
intermediate of and connected to the exten-
sion and latch whereby as the latch is oper-
ated the extension is moved into and out of
5 alinement with the exhaust-pipe, and means
adapting said extension to be operated inde-
pendently of said latch.

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

ALONZO J. SNOW.

Witnesses:

ABRAHAM E. PIERSON,
ALICE D. PIERSON.