

J. R. MORTON & W. H. STODDARD.
SMOKE PREVENTING DEVICE.

APPLICATION FILED DEC. 21, 1908.

945,339.

Patented Jan. 4, 1910.

2 SHEETS—SHEET 1.

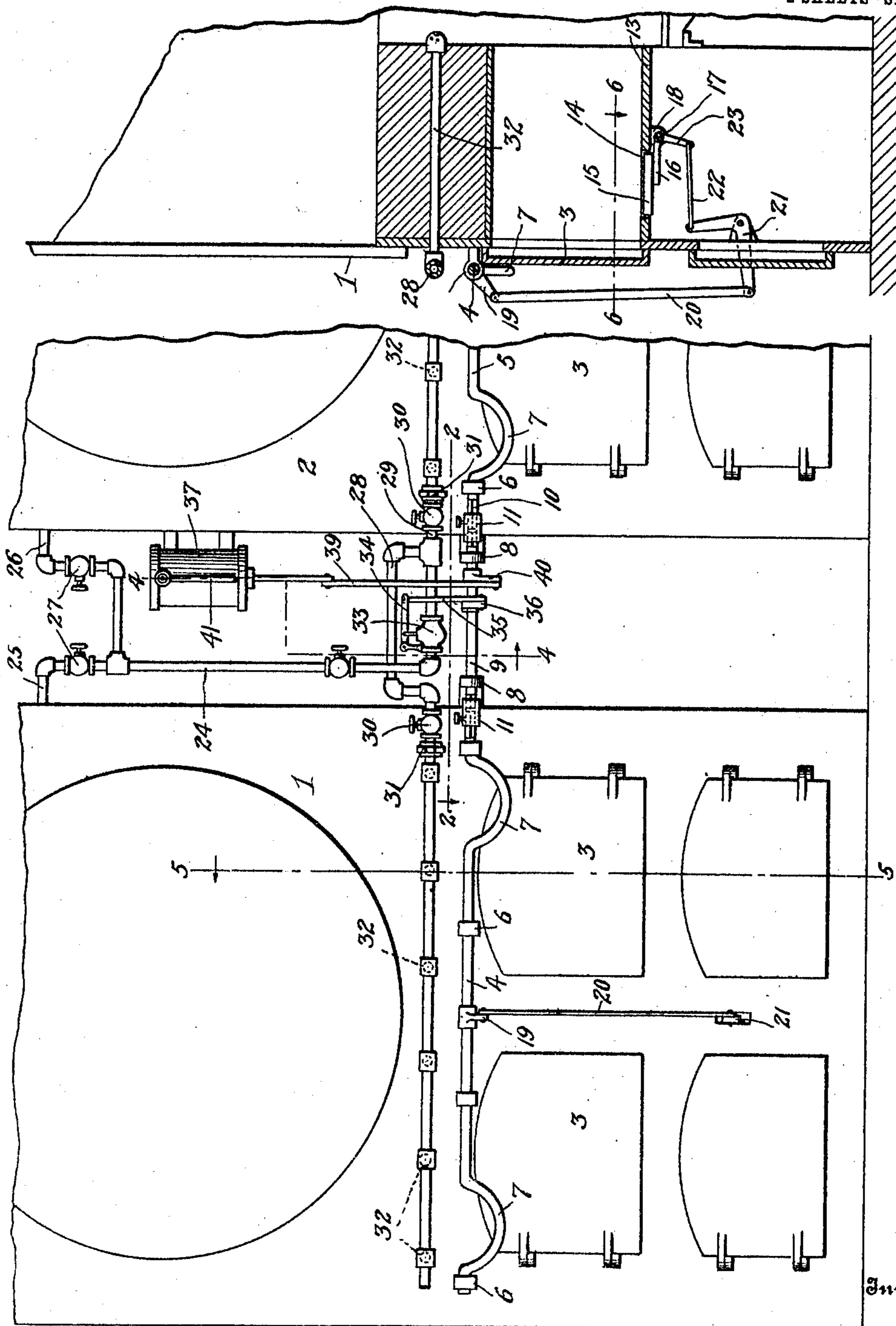


Fig. 1.

Fig. 2.

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Witnesses

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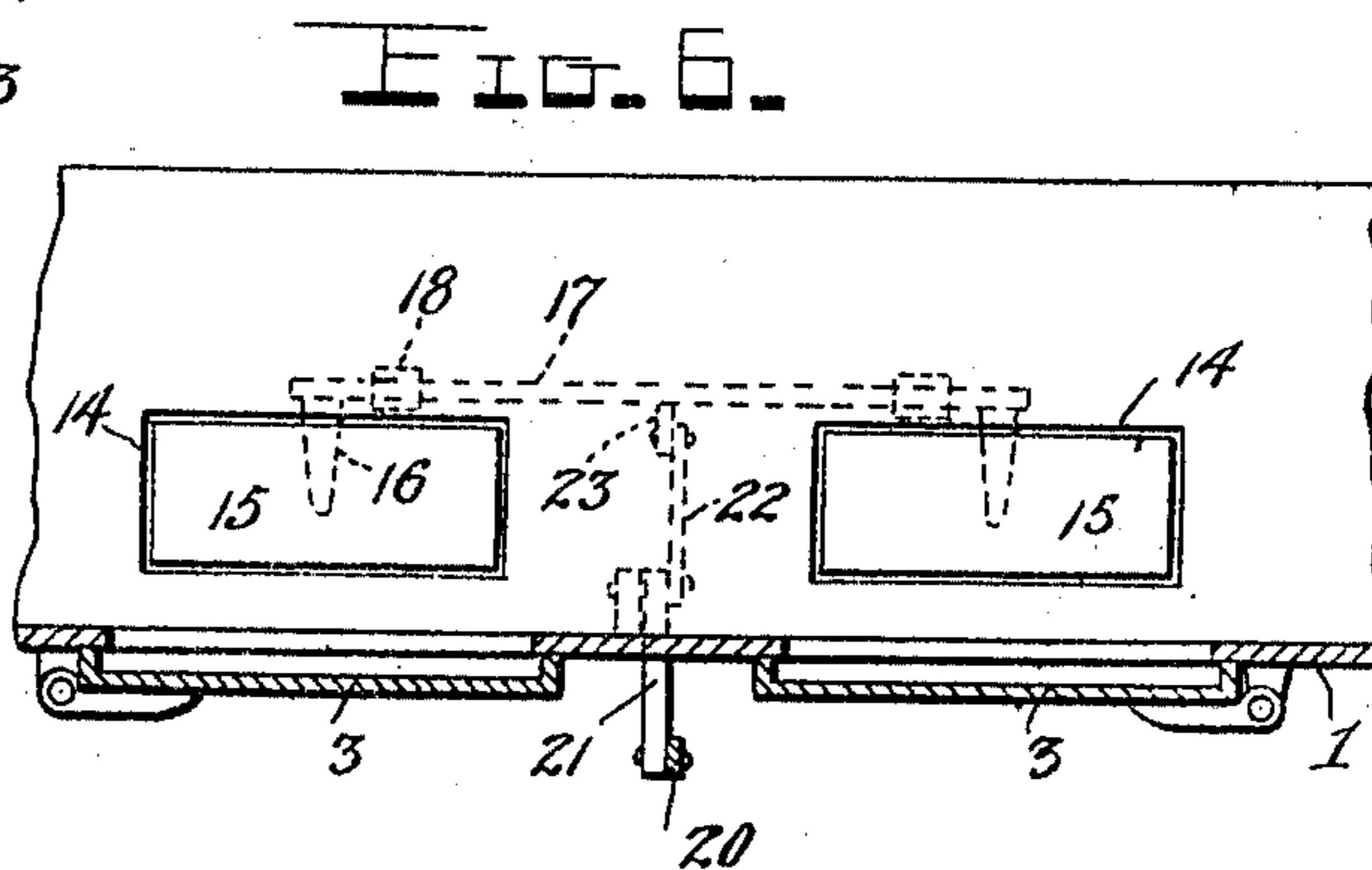
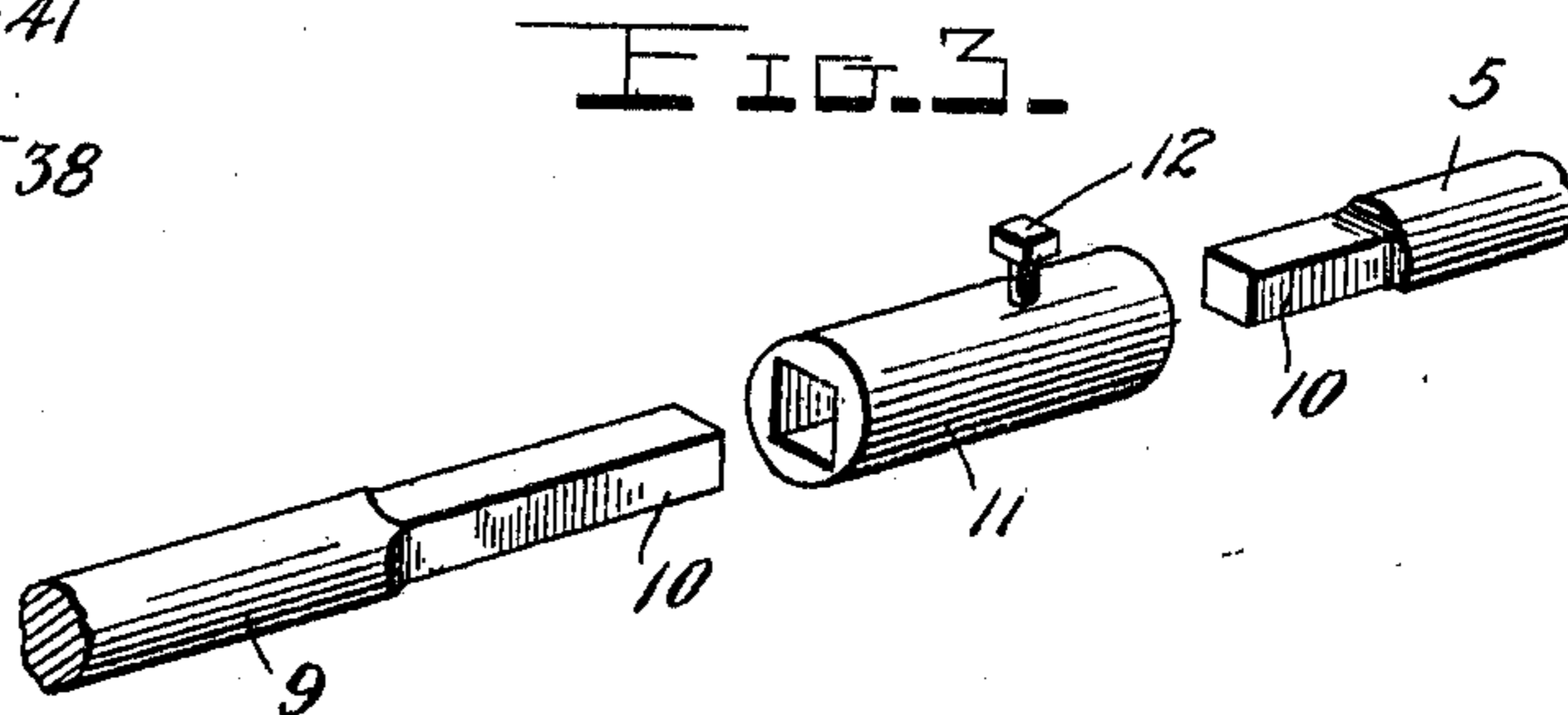
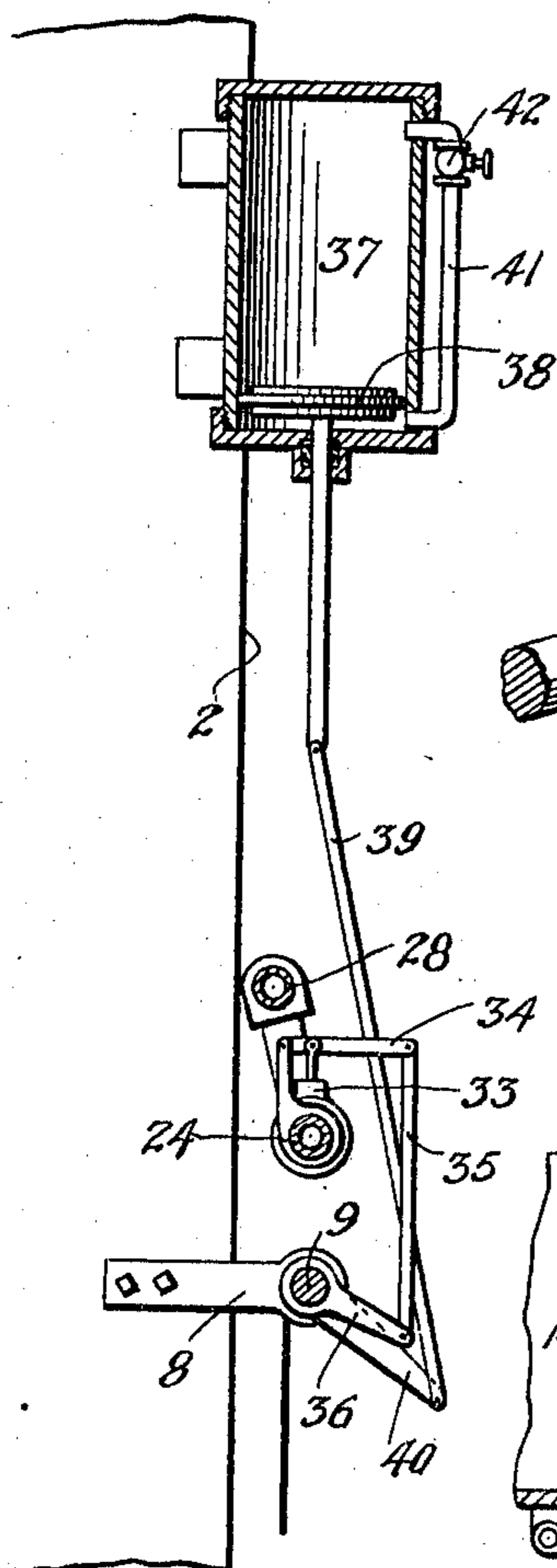
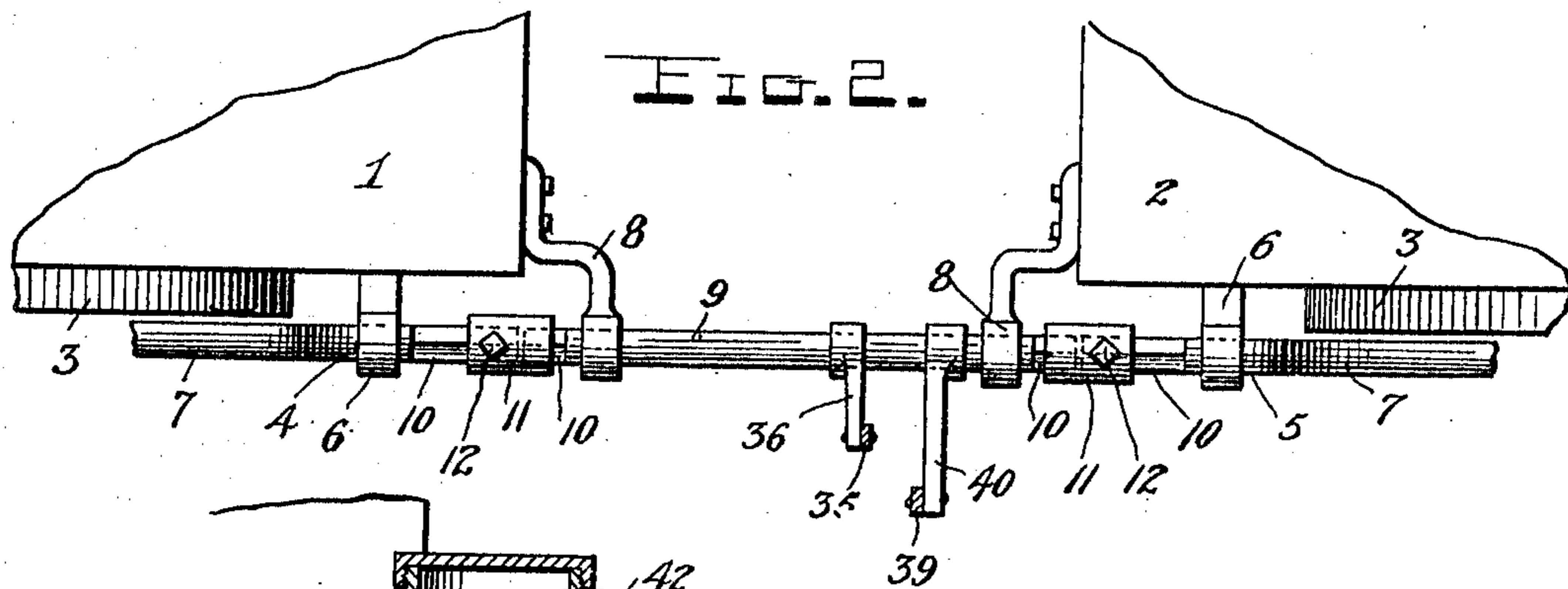


FIG. 4.

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UNITED STATES PATENT OFFICE.

JUDSON R. MORTON AND WILLIAM H. STODDARD, OF DETROIT, MICHIGAN.

SMOKE-PREVENTING DEVICE.

945,339.

Specification of Letters Patent.

Patented Jan. 4, 1910.

Application filed December 21, 1908. Serial No. 468,602.

To all whom it may concern:

Be it known that we, JUDSON R. MORTON and WILLIAM H. STODDARD, citizens of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Smoke-Preventing Devices, of which the following is a specification.

This invention relates to improvements in smoke consumers or preventers for steam boiler furnaces, and more particularly to that class of such devices in which steam or both steam and air are automatically admitted into the fire box of the furnace for a predetermined time after the opening of the fuel door.

The object of the invention is to provide a mechanism which will be more simple and reliable than devices of the same character heretofore produced and which has the special advantage of enabling either one of two boiler furnaces to be worked by the one mechanism, improved coupling means being provided whereby either of the furnaces may be thrown out of action.

The above object is attained in the embodiment of the invention illustrated in the accompanying drawings, in which:

Figure 1 is a front elevation of portions of two steam boiler furnaces showing the application of the invention thereto; Fig. 2 is a detail horizontal section taken on the plane indicated by the line 2—2 in Fig. 1; Fig. 3 is a perspective view showing one of the coupling devices; Figs. 4 and 5 are detail sectional views taken respectively on the planes indicated by the lines 4—4 and 5—5 in Fig. 1, and; Fig. 6 is a detail horizontal section taken on the plane indicated by the line 6—6 in Fig. 5.

Referring more particularly to the drawings, 1 and 2 denote the front portions of two steam boiler furnaces of well known form and construction having swinging fire box doors 3 through which fuel is fed to the fire. These doors when opened to replenish or stir up the fire, are adapted to actuate rock shafts 4, 5 arranged in longitudinal alinement with each other and journaled in bearing brackets 6 on the furnace fronts above said doors. Portions of said shafts are bent to form bow-shaped loops 7 which are disposed adjacent to the upper and inner corners of the doors to serve as lever or crank arms and which are swung upwardly

by the doors when opened so as to actuate said shaft in one direction.

Journaled in bearing brackets 8 projecting from the opposing side walls of the two furnaces is an intermediate rock shaft 9 which is disposed between and in longitudinal alinement with the shafts 4, 5 and is adapted to be operatively connected to or disconnected from either or both of said shafts. The coupling and uncoupling of these three shafts are preferably effected by forming their adjacent ends with flat faces or squared portions, as indicated at 10 in Fig. 3, and arranging slidable coupling sleeves 11 with similar shaped openings on said portions 10. When it is desired to connect the first mentioned shafts 4, 5 to the intermediate one 9 for simultaneous movement therewith, the sleeves 11 are engaged with the flat faced portions 10 of the adjacent shafts and secured by means of set screws 12 upon the sleeves or by any other fastening means. When it is desired to disconnect either of the shafts 4, 5 from the intermediate one 9, the sleeve 11 of such shaft is slipped inwardly upon it until the sleeve disengages the flat faced portion or end of the shaft 9 whereupon it may be secured by the set screw which it carries.

Air is admitted into the fire boxes or combustion chambers of the furnaces through draft opening 13 formed in their dead plates 14 and controlled by two dampers 15. The latter are connected to arms 16 upon a rock shaft 17 journaled in bearings 18 as seen in Figs. 5 and 6 of the drawings. These rock shafts of the two furnaces are operatively connected to the rock shafts 4, 5 respectively by providing upon each of the latter an arm 19 and connecting it by a link 20 to one arm of a bell-crank 21 which swings in a slot in the furnace front and has its other arm connected by a link 22 to an arm 23 on the shaft 17, as clearly shown in Fig. 5. By reason of these connections, it will be seen that when the fuel doors 3 of the furnaces are opened, their dampers 15 will be opened to admit air to the fire box. Steam is also admitted into the fire boxes of the furnaces when their doors are opened. This is accomplished by providing a main steam pipe 24 having two branches 25, 26 leading from the steam spaces of the two boilers and each containing a cut-off valve 27. Said main pipe 24 is also provided with two

branches 28, 29 containing cut-off valves 30 and connected by unions 31 to two steam pipes extending across the furnace fronts and provided with jets 32 which extend
 5 through the front walls of the furnaces, as shown in Fig. 5, and discharge steam into their fire boxes. In the main pipe 24 is arranged a quick acting valve 33 the stem of which is operated by a lever 34 connected by
 10 a link 35 to an arm 36 on the intermediate rock shaft 9, so that when the latter is operated the valve 33 will be opened.

The rock shafts 4, 5, 9 are actuated in one direction by the opening of the furnace
 15 doors and in the other direction by gravity, the movement in the latter direction being controlled by a cushioning or retarding device of any suitable form. As illustrated a dash pot or cylinder 37 is suitably mounted
 20 on one of the furnaces and its piston 38 has its rod connected by a link 39 to an arm 40 on the intermediate rock shaft 9. A by-pass 41 is arranged upon the cylinder 37 and contains a regulating valve 42 by means of
 25 which the closing of the dampers 15 and the valve 33 may be controlled.

In operation, assuming both of the rock shafts 4, 5 to be coupled to the shaft 9, when one of the furnace doors 2 is opened it will
 30 actuate all three of the rock shafts 4, 5, 9. The latter through the operating connections above described open the dampers 15, and the valve 33 and also move the piston 38 up in the cylinder 37. The admission of
 35 air and steam into the fire boxes of the furnaces increases the combustion which consumes the smoke while coal is being put on the fire or when the latter is stirred up. The descent of the piston in the cushioning
 40 cylinder under the weight of the parts connected to it, is gradual, and consequently, after a predetermined period the dampers 15 and the steam valve 33 are closed. The

steam discharged into the fire boxes may be taken from either one or from both of the
 45 boilers by reason of the valve controlled branches 25, 26 of the main steam pipe 24; and by reason of the valve controlled branches 28, 29 and the slip coupling sleeves 11 between the three rock shafts either one
 50 of the boiler furnaces may be thrown out of operation. These connections are also exceedingly advantageous after only one of the furnaces has been in operation and it is desired to work the other also, since steam
 55 from the one already in operation can be fed to the one being fired up.

Having thus described the invention, what is claimed, is:

The combination with a pair of boiler
 60 furnaces, of a main steam pipe, valve-controlled branch pipes in communication with the steam spaces of the boilers, other valve-controlled branch pipes for admitting
 65 steam into the fire-boxes of the furnaces, a valve in said main pipe, rock shafts journaled upon the furnaces and having cam loops actuated by the furnace doors, dampers operatively connected to the rock
 70 shafts for admitting air to the fire-boxes of the furnaces, an intermediate rock shaft arranged between and in longitudinal alignment with the first mentioned rock shafts, independent coupling devices for connect-
 75 ing the adjacent ends of the three rock shafts, means actuated by the intermediate rock shaft for operating the valve in the main steam pipe, and a cushioning device for the intermediate rock shaft.

In testimony whereof we affix our signatures in presence of two witnesses.

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Witnesses:

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