

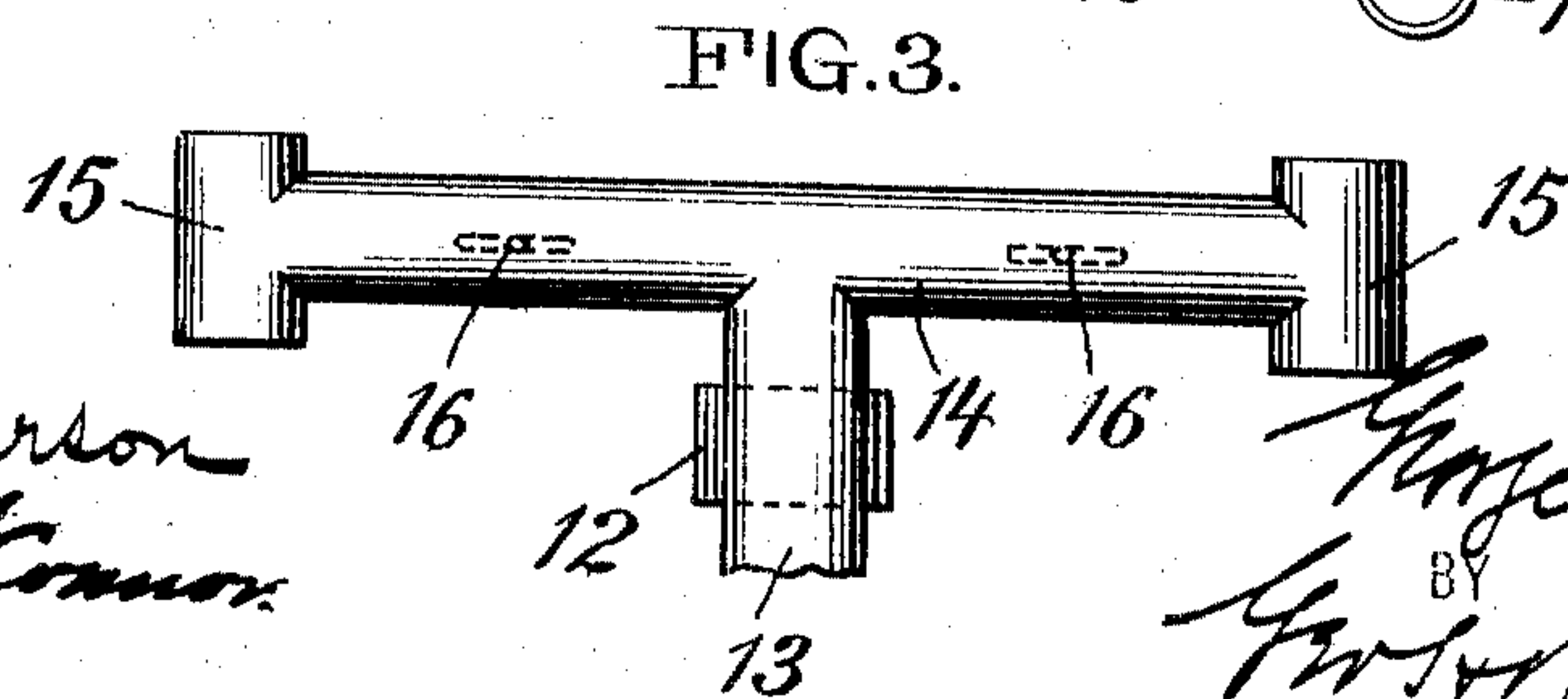
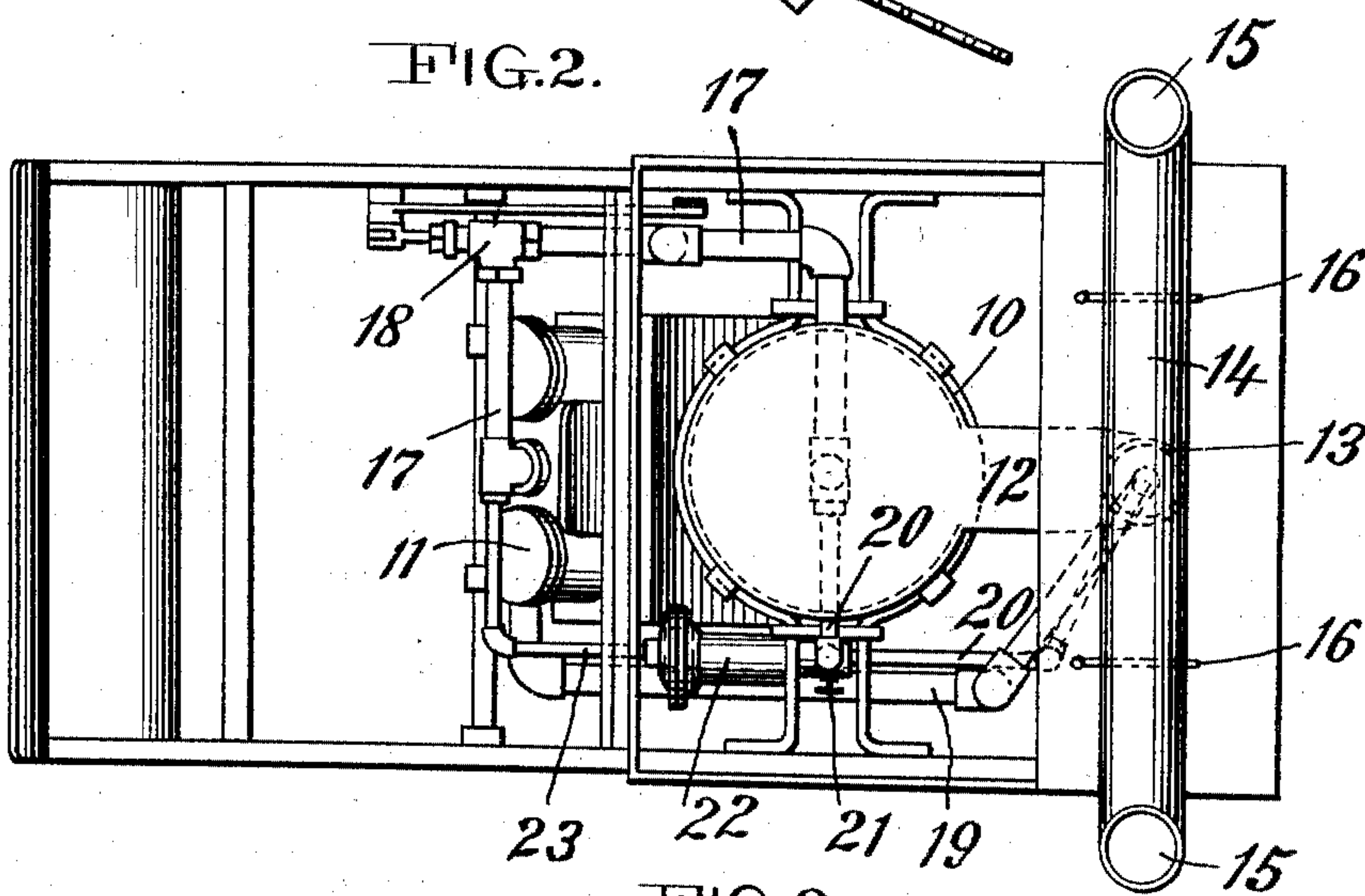
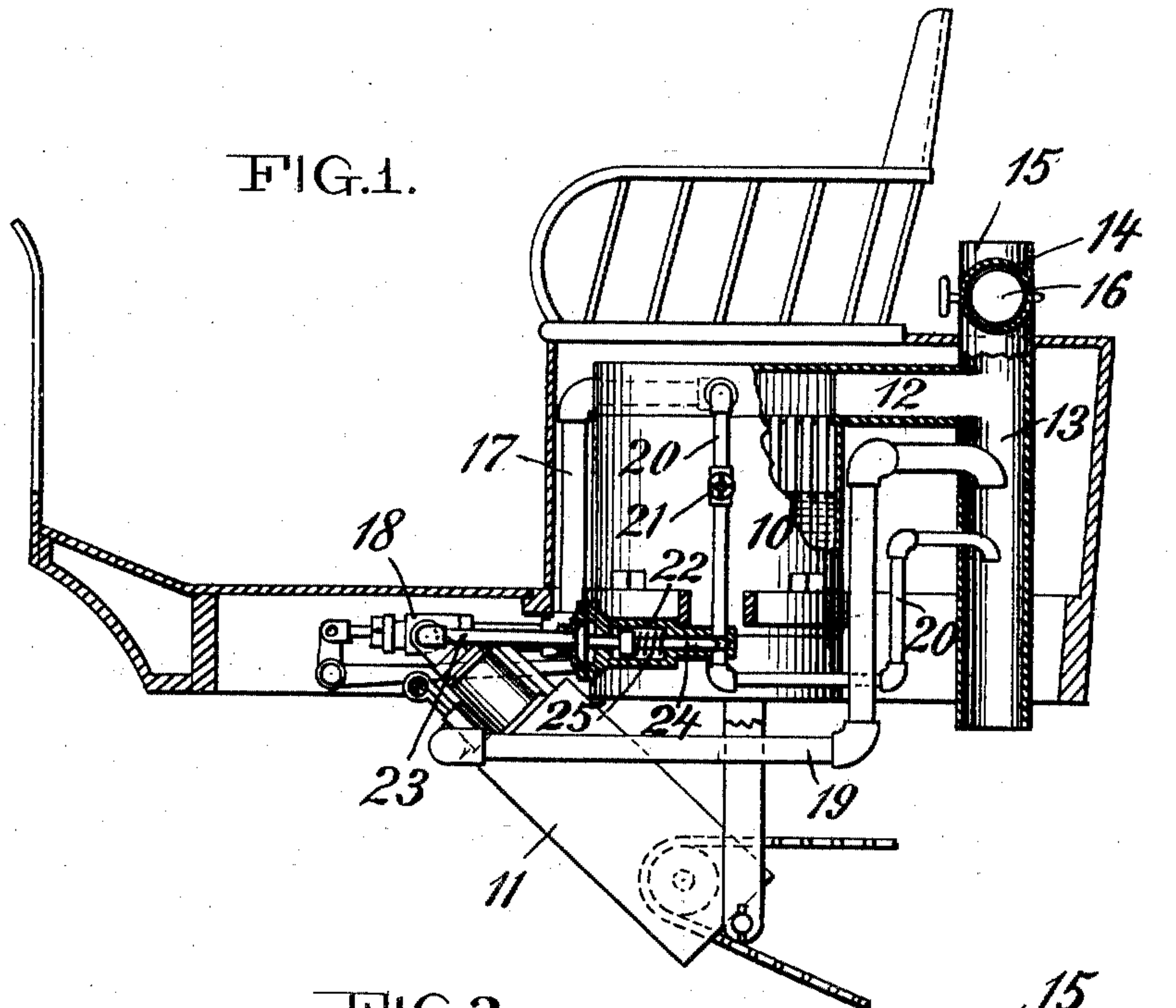
No. 766,830.

PATENTED AUG. 9, 1904.

G. LANE.  
MOTOR VEHICLE.

APPLICATION FILED DEC. 30, 1902.

NO MODEL.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

GEORGE LANE, OF POUGHKEEPSIE, NEW YORK.

## MOTOR-VEHICLE.

SPECIFICATION forming part of Letters Patent No. 766,830, dated August 9, 1904.

Application filed December 30, 1902. Serial No. 137,144. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE LANE, a citizen of the United States, residing at Poughkeepsie, county of Dutchess, State of New York, have invented certain new and useful Improvements in Motor-Vehicles, of which the following is a specification.

My invention relates to apparatus for controlling drafts through flues and regulating the same, and is especially adapted for use on motor-vehicles of the type adapted to be operated by steam.

The objects of my invention are to properly dispose of the products of combustion, to induce the desired and necessary draft at all times, to prevent back drafts from wind, &c., to enable the operator to force the draft when firing up or at other times when the engine is not running, and, finally, to obviate choking the combustion-chamber with an excess of combustible gas under severe road conditions.

It has been the common practice in steam-vehicles to utilize the exhaust of the engine to turn the products of combustion downward to the road and to sharpen the draft. It is well known that this sharpening of the draft increases the steaming efficiency. In apparatus where a hydrocarbon-burner is employed this sharpened draft permits the use of much more combustible gas than can properly be disposed of otherwise, and consequently from that cause, if from no other, increases the steaming capacity. It is also common practice to allow both upward and downward escape of the products of combustion, in which case the products of combustion escape through an upward outlet when firing up, as also when the engine is not running, but are forced downward through a flue-outlet by the impact or exhaust action of a downwardly-turned exhaust from the engines delivered in the down-flue when the engine is propelling the vehicle. As the exhaust-flues are ordinarily constructed the force of the draft through the boiler is very much weakened by the access of air-currents to the downward flue entering through the upper opening, already described. Wind-currents particularly

affect the upper opening in the exhaust-flue, interfering seriously with the draft. Consequently a flow of combustible gas to the burner that can be advantageously handled while the engine is running becomes immediately excessive upon the cessation of the exhaust from the engine, causing the burner to smoke and frequently the excess of combustible gas to come out beneath the burner, with the consequent danger of conflagration. My invention overcomes all these difficulties and may be carried into effect by the construction shown in the accompanying drawings, in which—

Figure 1 is a longitudinal section through a motor-vehicle with a portion of the boiler broken away, showing the relative position of the parts. Fig. 2 is a plan view. Fig. 3 is a rear elevation of the upper portion of the exhaust-flue.

Like numerals indicate corresponding parts.

In the drawings, 10 indicates the boiler, 11 the engine, and 12 horizontal flue leading from the top of the boiler and discharging into a vertical flue 13. Arranged over the top of the vertical flue 13 is a horizontal flue 14, to which are connected the vertical end portions 15. These vertical end portions are open at the top and bottom. Arranged within the horizontal flue 14 are the dampers 16.

17 indicates the main steam-pipe from boiler to valve-chest of engine; 18, throttle-valve in main steam-pipe; 19, exhaust-pipe leading from engine and discharging in a downward direction into the vertical flue 13; 20, pipe leading from the top of boiler and discharging as a jet in the vertical flue 13; 21, valve in pipe 20; 22, automatic regulator-valve in pipe 20. This valve is preferably of what is known as the "diaphragm" type and is connected at the left of the diaphragm—that is, in front of the diaphragm—through pipe 23 to main steam-pipe 17. Arranged around the stem 24 of the regulator-valve is a spring 25, which normally tends to maintain the valve in an open position.

The operation of this invention will be readily understood. On firing up before steam-pressure is obtained the dampers 16



are left open to allow the products of combustion to escape upward through the vertical flues 15. The vertical flues 15 serve to prevent wind-currents from entering the flues 14 and 13, and thereby reverse the normal upward draft. After some steam-pressure has been obtained the valve 21 in the pipe 20 is opened, which allows live steam to flow through the pipe 20 and be delivered in a downward direction in the vertical flue 13, thus creating a downdraft in the flue 13. The dampers 16 may then be closed, which prevents air from entering through the flues 15 14, and thereby destroying the usual effect upon the boiler and the burner of the forced downward draft, created as above described. When the vehicle is being propelled, the exhaust-steam issuing from the pipe 19 and discharging in a downward direction in flue 13 induces a strong draft in the down-flue. When steam is admitted to the engine, steam-pressure is also communicated, through the pipe 23, to the front of the regulator-diaphragm, which by moving the diaphragm inward correspondingly moves the valve-stem against its seat in the pipe 20, thus closing the direct live-steam passage from the boiler to the jet in the flue 13 through the pipe 20. When the steam-pressure in the pipe 23 is cut off, as it will be by closing the throttle 18 of the engine, the spring 25 moves the valve-stem forward away from its seat, thereby opening pipe 20 and allowing steam to pass from the boiler and be discharged in the vertical flue 13 in a downward direction, thus automatically inducing a draft in the down-flue when the engine is not working and cutting off the live steam from the jet on pipe 20 to vertical flue 13 when the engine is working.

If it is desired to leave the vehicle standing, with the fire extinguished, the valve 21 in the pipe 20 is closed, as also the dampers 16, with the effect that the upward flow of air through the boiler-flues is cut off and the steam-pressure thus maintained for a longer period than if free circulation of air through the boiler is permitted.

I wish it understood that I do not limit myself to the precise construction described, as many modifications may be arranged without departing from the spirit and scope of my invention. For instance, the flues 13 14 15 could be differently arranged, the delivery-jets from the pipes 19 20 differently placed as regards the flues 13 14 15, the automatic regulator could be connected to be actuated by pressure in the exhaust-pipe beyond the engine, the automatic regulator could be arranged to be actuated by direct pressure from the boiler, as may be preferable if using solid fuel, the parts may be so arranged as to maintain a sufficient draft at all times in a downward direction without closing the dampers, and, further, the live-steam pipe may have another automatic valve introduced in it adapted

to be operated by direct boiler-pressure to cut off the live-steam jet when sufficient boiler-pressure has been obtained.

Having thus described my invention, I claim—

1. In a steam motor-vehicle, a burner, a boiler, a flue for the products of combustion, a live-steam jet in said flue, a steam-motor, and means for automatically decreasing the discharge from said steam-jet as the steam-pressure exhibited through the motor is increased.

2. In a steam motor-vehicle, a burner, a boiler, a flue for carrying off the products of combustion, a live-steam jet in said flue, a steam-motor, a throttle for controlling the steam to the motor, and a diaphragm-regulator for controlling the steam-jet located in the steam-supply to the motor and beyond the throttle.

3. In a steam motor-vehicle, a burner, a boiler, a flue for carrying away the products of combustion, a live-steam jet in the flue, a steam-motor, and means for simultaneously varying the discharge from said jet as the steam-pressure exhibited through the motor is varied.

4. In a steam motor-vehicle, a burner, a boiler, a flue for carrying away the products of combustion from the burner, a live-steam pipe, a throttle on the steam-pipe, a live-steam jet connected to said steam-pipe and adapted to discharge into said flue, and means for automatically varying the discharge from said steam-jet as the pressure exhibited through the motor is varied.

5. In a steam motor-vehicle, a burner, a boiler, a downwardly-extending flue for carrying away the products of combustion from the burner, a live-steam jet arranged to induce a draft in said flue, a steam-motor, and a diaphragm-regulator for automatically controlling the supply of live steam to said jet in accordance with the steam-pressure exhibited through the motor.

6. In a motor-vehicle, a burner, a boiler, a flue for carrying away the products of combustion from the burner, a live-steam jet in the flue, a steam-motor, and a diaphragm-regulator actuated by the varying steam-pressure on the motor for controlling the live-steam supply to the jet.

7. In a steam motor-vehicle, a burner, a boiler, a flue for carrying away the products of combustion, a motor device, and an automatically-controlled jet in said flue arranged to blow when less than a predetermined pressure is on the motor device and to be shut off when a greater amount of pressure is on the motor device.

8. In a steam motor-vehicle, a burner, a boiler, a flue for carrying away the products of combustion, a steam-engine, an exhaust from the engine discharging into the flue, a live-steam jet discharging into the flue, and



means for automatically varying the discharge from said steam-jet as the steam-pressure exhibited through the motor is varied.

9. In a steam motor-vehicle, a burner, a boiler, a flue for carrying away the products of combustion, an engine arranged to exhaust into said flue to induce a draft, and a live-steam jet arranged to induce a draft when less than a predetermined pressure is on the engine.

10. In a steam motor-vehicle, a burner, a boiler, a flue for carrying away the products of combustion from the burner, said flue having both upward and downward discharge openings, a motor, a live-steam jet adapted to discharge into said flue, and means for automatically controlling the discharge of said steam-jet as the pressure exhibited through the motor is varied.

11. In a motor-vehicle, a burner, a boiler, a flue for carrying off the products of combustion, a motor, an exhaust-pipe from said motor discharging into said flue, a hand-operated throttle for controlling the steam discharged through said exhaust-pipe, a steam-jet discharging into said flue, and automatic means for controlling the discharge from the steam-jet in accordance with the pressure of the steam discharged through the exhaust-pipe.

12. In a motor-vehicle, a burner, a boiler, a flue for carrying off the products of combustion, said flue having upward and downward discharge openings, a motor, a live-steam jet arranged to induce draft in the downward discharge of said flue, and means controlled by the pressure on the motor for automatically controlling the steam-jet.

13. In a motor-vehicle, a burner, a boiler,

a flue for carrying off the products of combustion, said flue having both upward and downward discharge openings, a motor, a live-steam jet arranged to induce draft in the downward discharge from said flue, means for automatically varying the discharge from said jet as the steam-pressure exhibited through the motor is varied, and means for manually controlling the jet.

14. In a motor-vehicle, a burner, a boiler, a discharge-flue for the products of combustion, a motor, an exhaust-pipe leading from said motor to said flue, and means controlled by the pressure exhibited through the motor for automatically increasing the draft in said flue over that due to the exhaust from the motor.

15. In a motor-vehicle, a burner, a boiler, a discharge-flue for the products of combustion, a motor, means for creating a draft in said flue, and automatic means controlled by the pressure of steam exhibited through the motor for increasing the draft in said flue as the pressure through the motor is increased.

16. In a motor-vehicle, the combination of a burner, a boiler, an engine, a discharge-flue for the products of combustion, an exhaust-pipe from the engine to the discharge-flue, a pipe from the boiler to the discharge-flue, a valve in said pipe, said valve normally open but adapted to be automatically closed when steam from the boiler is transmitted to the engine.

In testimony whereof I affix my signature in the presence of two witnesses.

GEORGE LANE.

Witnesses:

W. J. LANE,  
J. M. JANES.