No. 775,914. PATENTED NOV. 29, 1904.

E. DYSON.

INJECTOR OR BURNER FOR OIL, LIQUID, OR GASEOUS FUEL.

APPLICATION FILED NOV. 23, 1901.

NO MODEL. 4 SHEETS—SHEET 1.

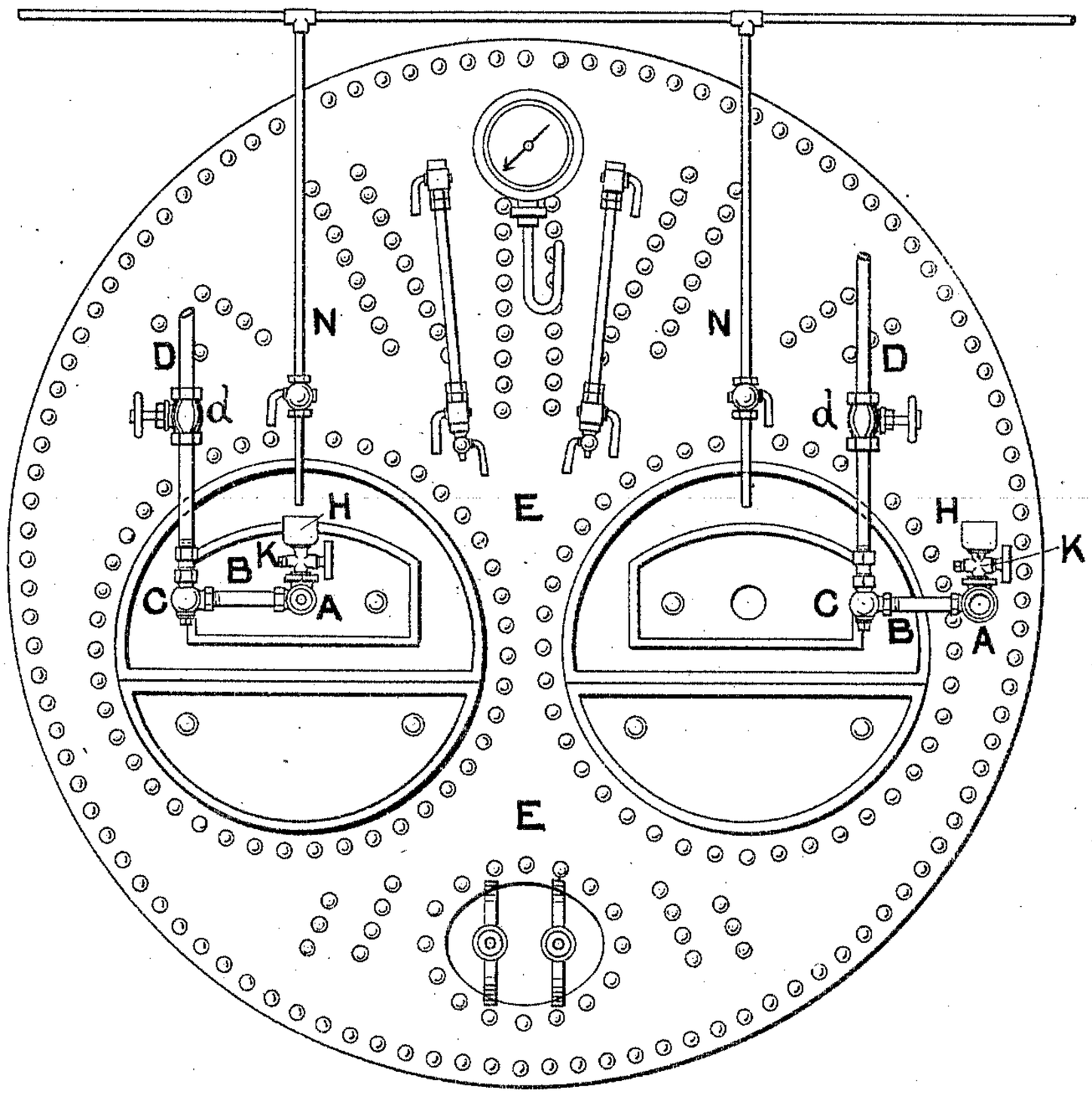

FIG. I.

WITNESSES.

E. Howard.

Joseph Bates.

INVENTOR.

Eli Dyson

by O'Brien & Owens

atty's.

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NO MODEL. 4 SHEETS—SHEET 2.

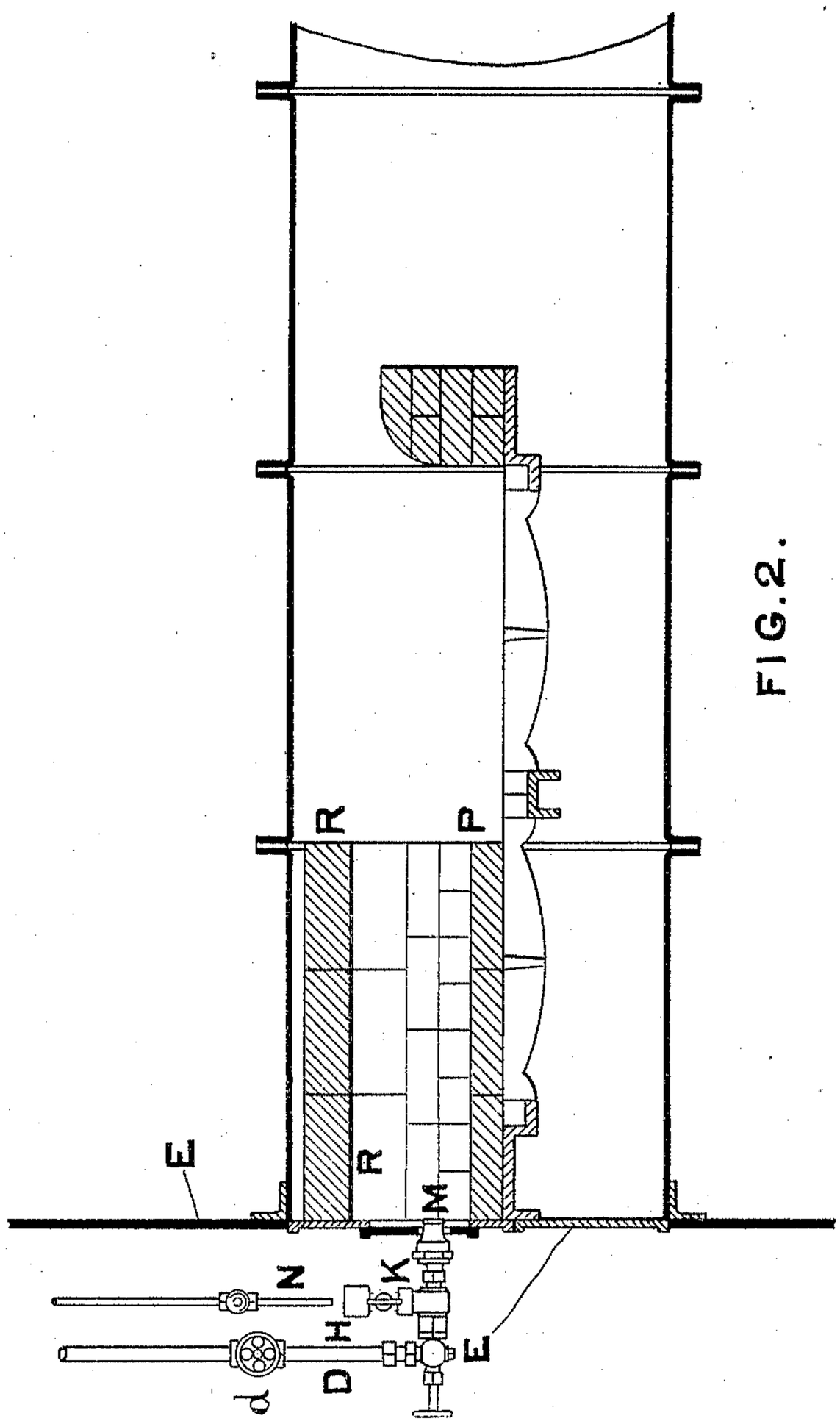

FIG. 2.

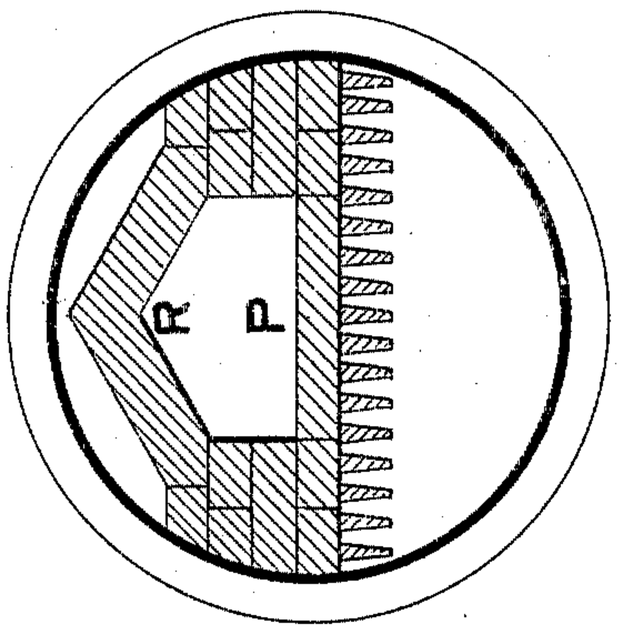

FIG. 3.

WITNESSES.

C. Howard.

Joseph Bates.

INVENTOR.

Eli Dyson

by Dowell & Dowell

Atty.

No. 775,914. PATENTED NOV. 29, 1904.

E. DYSON.

INJECTOR OR BURNER FOR OIL, LIQUID, OR GASEOUS FUEL.

APPLICATION FILED NOV. 23, 1901.

NO MODEL. 4 SHEETS—SHEET 3.

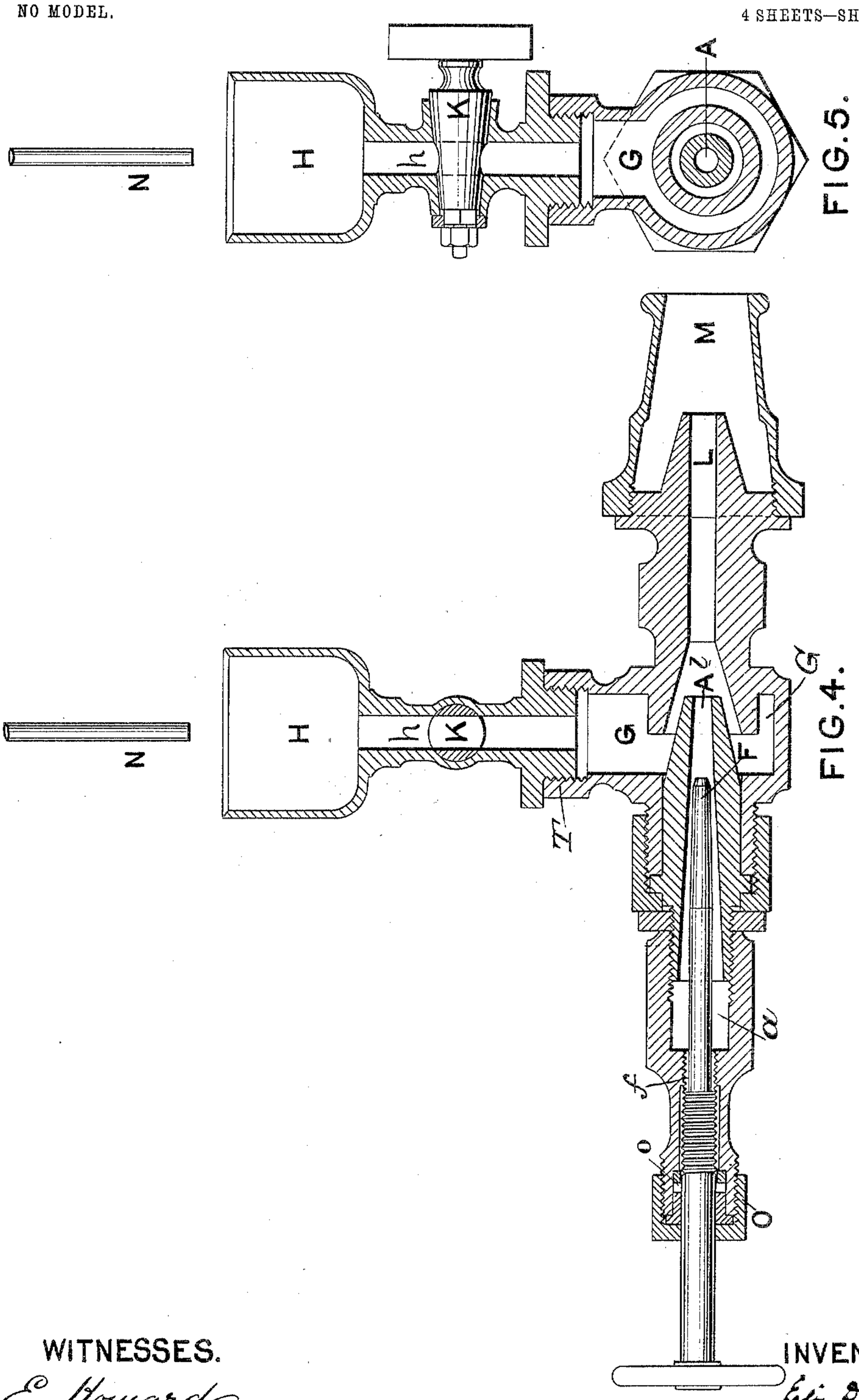

FIG. 5.

FIG. 4.

WITNESSES.

E. Howard.

Joseph Bates.

INVENTOR.

Eli Dyson

by J. Owen O'Brien

atty.

No. 775,914. PATENTED NOV. 29, 1904.

E. DYSON.

INJECTOR OR BURNER FOR OIL, LIQUID, OR GASEOUS FUEL.

APPLICATION FILED NOV. 23, 1901.

NO MODEL. 4 SHEETS—SHEET 4.

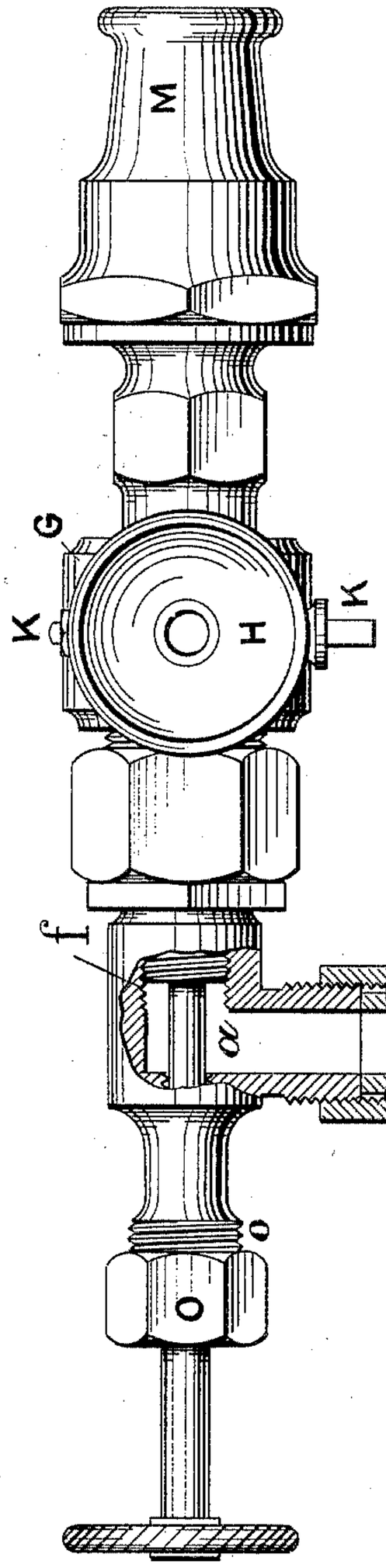

FIG.6.

WITNESSES.

E. Howard.
Joseph Bates.

INVENTOR.

Eli Dyson
by O'Brien & O'Brien
atty

No. 775,914. Patented November 29, 1904.

UNITED STATES PATENT OFFICE.

ELI DYSON, OF MANCHESTER, ENGLAND.

INJECTOR OR BURNER FOR OIL, LIQUID, OR GASEOUS FUEL.

SPECIFICATION forming part of Letters Patent No. 775,914, dated November 29, 1904.

Application filed November 23, 1901. Serial No. 83,457. (No model.)

To all whom it may concern:

Be it known that I, ELI DYSON, a British subject, and a resident of Manchester, in the county of Lancaster, England, have invented certain new and useful Improvements in Injectors or Burners for Oil, Liquid, or Gaseous Fuel, of which the following is a specification.

The object of this invention is to provide a sight-feed injector or burner in which the supply or oil-feed can be always under observation and the air-inlet regulated, and also to provide for the burner being set at any angle or inclination to direct the oil or fuel in any direction into the furnace.

The invention will be fully described with reference to the accompanying drawings.

Figure 1 is a front elevation of boiler with oil injector or burner fitted thereto, the burner at the left flue being shown in position for feeding the furnace, and that at the right flue when swiveled or turned away out of use; Fig. 2, longitudinal sectional elevation through the left flue; Fig. 3, transverse sectional elevation of one boiler-flue; Fig. 4, longitudinal sectional elevation of injector, drawn to an enlarged scale; Fig. 5, transverse sectional elevation of same through the oil-cup and supply-pipe; Fig. 6, plan of same, partly in section.

The injector is provided with a steam nozzle or injector A, through the interior of which the steam issues from a steam-chamber *a*, supplied with steam through a steam-pipe B. (Shown in section, Fig. 6.)

The steam-pipe B is fitted to a swiveling joint C to enable the injector to be turned into or out of position as required, as shown in Fig. 1. The swiveling joint C is provided with a fixed plug or tap *c*, with port or aperture *c'* leading into the steam-pipe B. The swiveling joint C and tap *c* are fitted to a steam-supply pipe D, which is connected with any of the ordinary steam-pipes leading from the boiler E. The steam-supply pipe is fitted with an ordinary stop-valve *d*.

The steam-nozzle A is provided with a conical or taper plug F, which projects into it from the rear and by which the passage or orifice through the nozzle can be contracted or enlarged to control or regulate the passage of the steam therethrough. The spindle of the plug F is formed with a screw-thread and passes through a screw in the socket *f*, so that by rotating the hand-wheel at the end of the spindle the plug F may be withdrawn or advanced to permit more or less steam to pass through the nozzle, as may be required. The socket *f* also forms the steam-chamber *a* and is screwed into the rear end of the nozzle A, and the nozzle A is secured by a screwed union to the part comprising the vacuum-chamber G and the delivery-nozzle L.

The steam-nozzle A passes into or through a vacuum and an oil-receiving chamber G, and beyond it and above the nozzle is fitted into a socket by a removable screwed plug T, an open oil and air cup H with oil and air supply pipe *h*, through which the oil is admitted to the top of the nozzle A, upon which the oil drops. A plug or tap K is fitted in the oil and air pipe *h* to regulate the supply of air, the supply of oil being regulated by the pipe N.

The delivery-nozzle L is constructed with a hollow mixing-cone *l* in front of the steam-nozzle A and is fitted in front of the vacuum-chamber G. Around the delivery-nozzle is placed a closed spreading nozzle M of larger diameter to insure the whole of the oil being carried forward with the steam, and thus prevent waste. The nozzle M is closed around the nozzle L, forming a vacuum-chamber around it, into which air passes from the front and mixes with the issuing steam and oil.

The oil-supply pipe N is fitted at any desired distance above the oil-cup H, with a space between to permit of a flow of oil either drop by drop or in a thin stream, the supply being under observation, so that the amount of oil being consumed may always be proportionate to actual requirements.

The steam-pipe B is preferably placed at right angles to the steam-nozzle A and delivery-nozzle L, entering at the side of the steam-chamber *a*, and the regulating-plug F enters the nozzle through a cap O and stuffing-box *o*, so that in case of any obstruction or stoppage occurring in the injector-nozzle

by removing the plug a straight passage is opened and a wire or other instrument may readily be inserted to remove the obstruction.

The injector may be used for burning creosote oil, hydrocarbon, water-gas tar, coal-gas tar, petroleum residue, petroleum crude oil, coal-gas, oil-gas, mona-gas, producer-gas, &c., and also as a steam-jet apparatus.

I consider that with this construction and arrangement of apparatus variations of the steam or injector pressure will not cause the feed to vary, as is the case when connected direct from a steam-pump to the supply-pipe or dependent on a constant vacuum being maintained. The boiler-furnace is preferably fitted with a layer or floor of tiles P, set close together, and with an arch or crown of tiles R at the front end, which become heated and assist in the combustion and gasifying of the oil.

What I claim as my invention, and desire to protect by Letters Patent, is—

1. An injector or burner for liquid or gaseous fuel comprising in its construction a steam-nozzle A formed with a conical end projecting into the suction-chamber G, a steam-chamber *a* placed behind the nozzle A, a conical regulating-plug passing through the steam-chamber and projecting into the steam-nozzle A, a socket fitted behind the steam-nozzle into which the spindle of the conical plug F is screwed, a suction-chamber G, surrounding the steam-nozzle A and through which the nozzle projects, an internal socket at one side of the suction-chamber G, an oil-supply pipe *h* affixed to the internal socket of the suction-chamber G, a tap K on the pipe *h* to regulate the air-supply, an open oil-cup H fitted on the oil-pipe *h* through which oil and air are admitted to the suction-chamber G, a delivery-nozzle L with hollow mixing-cone *l*, embracing the end of the steam-nozzle A, and a closed spreading nozzle M of larger diameter surrounding the nozzle L to prevent drip and waste of oil, substantially as described.

2. An injector or burner for liquid or gaseous fuel comprising in its construction a steam-nozzle A, formed with a conical end projecting into the suction-chamber G, a steam-chamber *a* placed behind the nozzle A, a steam-inlet pipe B entering the steam-chamber *a*, a swiveling joint C at the end of the steam-pipe B to support the burner, a conical regulating-plug F passing through the steam-chamber *a*, and projecting into the steam-nozzle A, a socket *f* fitted behind the steam-nozzle into which the spindle of the conical plug F is screwed, a suction-chamber G affixed to the nozzle A, and through which the nozzle projects, provided with an inlet-socket T, an oil-supply pipe *h* affixed to the suction-chamber by the screw-socket T through which oil and air are admitted, a tap K on the supply-pipe *h* to regulate the air-supply, an open oil-cup H fitted to the supply-pipe *h*, a delivery-nozzle L with hollow mixing-cone *l* embracing the end of the steam-nozzle A, and a closed spreading nozzle M of larger diameter surrounding the nozzle L to prevent drip and waste of oil, substantially as described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

ELI DYSON.

Witnesses:
I. OWDEN O'BRIEN,
HARRY BARNFATHER.