

Nov. 9, 1943.

S. H. MORSE

2,333,733

APPARATUS FOR DEVELOPING SENSITIZED LAYERS BY AMMONIA OR OTHER GAS

Filed April 1, 1941

3 Sheets-Sheet 1

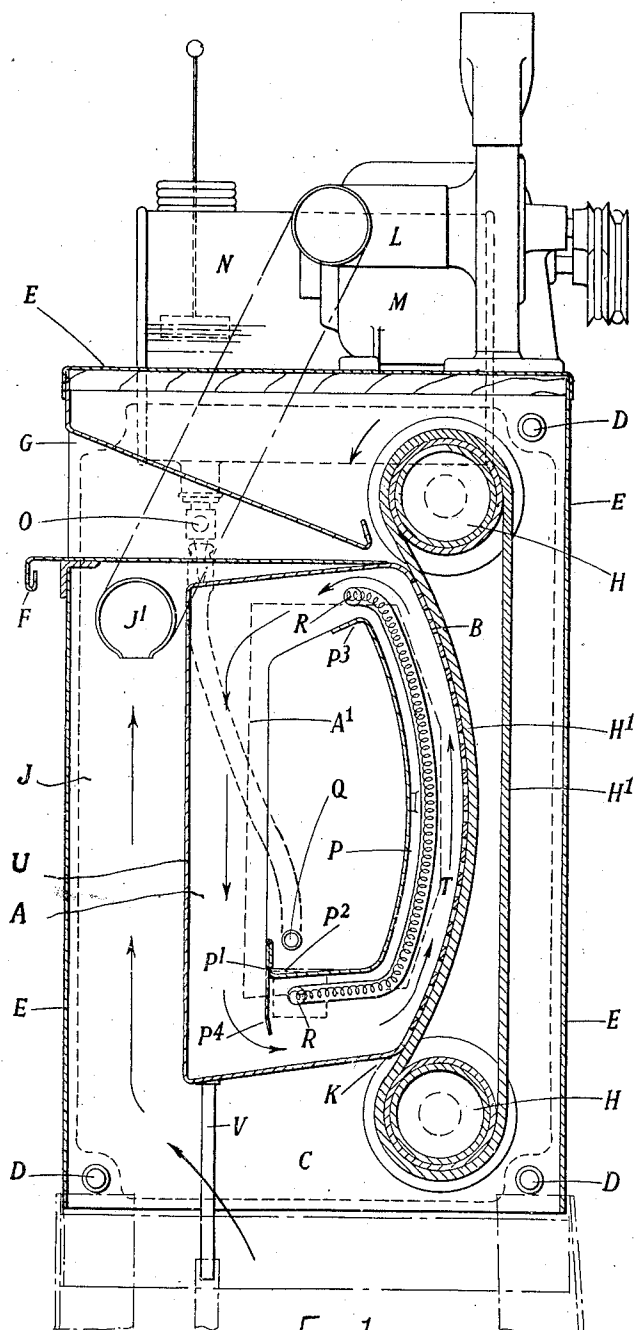


FIG. 1

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3 Sheets-Sheet 2

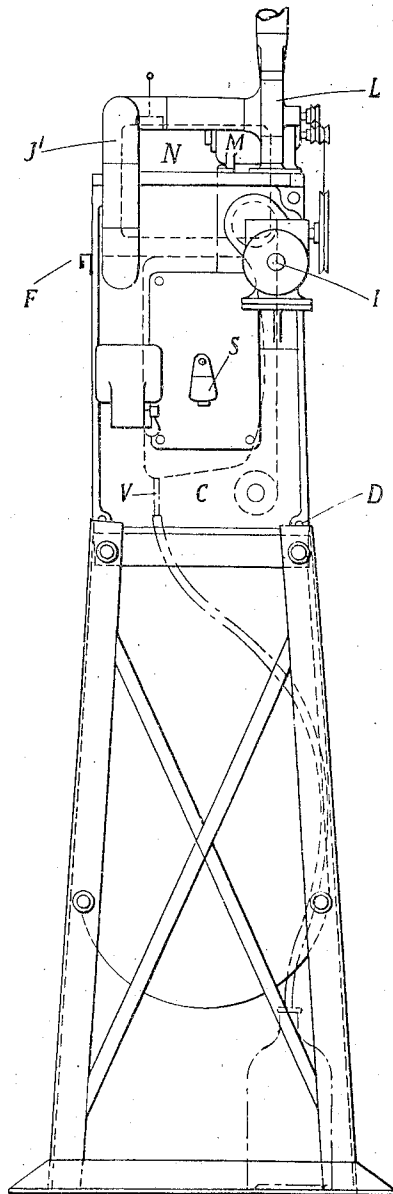


FIG. 2

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3 Sheets-Sheet 3

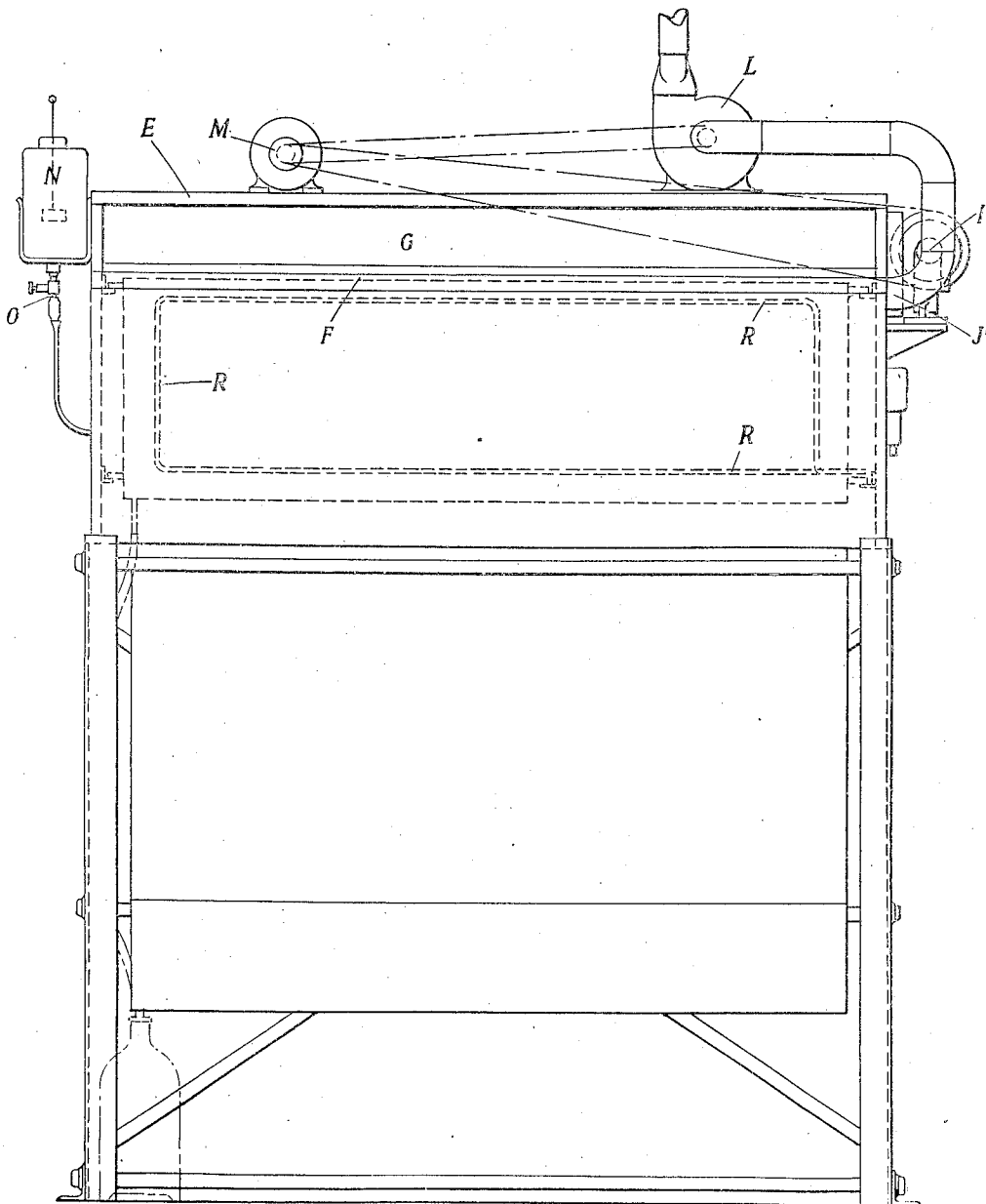


FIG. 3

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UNITED STATES PATENT OFFICE

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APPARATUS FOR DEVELOPING SENSITIZED
LAYERS BY AMMONIA OR OTHER GAS

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to Wood, Mallabar & Company Limited, Lon-
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Application April 1, 1941, Serial No. 386,364
In Great Britain April 13, 1940

5 Claims. (Cl. 95—94)

The invention relates to apparatus for develop-
ing photographic sensitized layers, in which the
said layers are subjected to the action of ammonia
or other developing gas produced by heating the
developing liquid inside the developing tank by
means of an electric heater or heaters.

In apparatus of this kind it is essential that
whilst the developing medium must be main-
tained at the right degree of humidity in order
to obtain perfect development, at the same time
moisture must not be allowed to condense upon
the surface of the sensitized layer as this results
in imperfect development.

The object of the invention is to provide a
simple and compact apparatus for developing
photographic sensitized layers by the action of
ammonia or other gas which is in a continuous
humid state in which the moisture content of the
developing gas is prevented from condensing upon
or in the immediate vicinity of the layers whilst
they are passing through the apparatus.

The invention consists in an apparatus for
developing photographic sensitized layers by am-
monia gas or other vapour produced by heating
the developing liquid inside the developing tank
by means of an electric heater or heaters, and in
which condensation is prevented in the whole of
the developing area. The heater is arranged to
go round each side of the developing tank, across
the top, and underneath the plate which contains
the liquid, and is of rectangular shape, whereby
condensation will be prevented in the whole of
the developing area. An important feature of the
invention is the provision of means whereby an
even and uniform circulation of the gases and
vapours is produced.

The invention also consists in the further fea-
tures hereinafter claimed.

Figure 1 is a cross section end view.

Figure 2 is an end elevation.

Figure 3 is a front elevation.

In carrying the invention into effect, a tank is
provided of D-shape cross section A which is
perforated on the curve B for the exit of the
ammonia gas or other vapour which develops the
layers. This tank A is supported by end frames C
which are held together by stretcher bars D, and
enclosed by cover plates E, which house the
apparatus.

A feed plate F and coiling plate G are used
for entry of the layers.

Mounted within the side frames are two main
rollers H which are embraced by the endless
blanket H¹ and are rotated by gear I. At the
back of the tank there is a longitudinal gap J

which is used for ventilating purposes by a suc-
tion tube J¹ and where the layers emerge from
point K surplus gas will be drawn through tube J¹
and taken out through the suction fan L into the
open air outside the room or building.

Suitable gear is mounted on top of the appara-
tus as shown in Figures 1, 2 and 3, and a motor M
is used to drive the gear I as well as the suction
fan L.

At the side of the apparatus there is a supply
tank N which contains the liquid which is allowed
to feed into the D-shape tank A by a control valve
O, and this liquid drops into the bottom of the
inside baffle plate P at Q.

In the cross section Figure 1, the heater R is
shown which comes in the tank A at one end,
and is underneath the baffle plate P and con-
tinues towards the opposite end, and is bent round
and upwards near the perforated curve and re-
turns across the top and down the side again
and comes out at the entry for electrical con-
nection which produces a heater of rectangular
shape.

The baffle plate P shown in Figure 1 cross sec-
tion is continued through the whole length of the
tank A, and it is turned up at Point P¹ to accom-
modate the liquid shown at P² and at the top it is
turned over at P³ for directing circulation of the
gases. There is a lower additional baffle plate P⁴
which has a gap allowing circulation as shown
by the arrow.

The tank A has both ends sealed with cover
plates A¹ and these are fitted after assembling
the heater and plates inside of the tank.

A thermostat S may be fitted to control the
heat.

The apparatus is employed in the following
manner.

When the motor M is started the heater R
is also switched on, the rollers H are rotated and
the endless blanket H¹ is set in motion and the
layers which are fed over feed plate F are drawn
downwards and across the perforated plate B
and are developed by the ammonia or other gas
and delivered at point K. The drop valve O is
opened and the liquid runs in through a pipe
at Q and is evaporated at P² by the heater R
which is underneath baffle plate P. The addi-
tional baffle plate P⁴ partly shuts in the heat
given off by the lower part of heater R, and
is used for a dual purpose; evaporation of the
liquid is produced at P² and circulation of the
gases by utilizing the heat from P⁴ which goes
forward up the slope of the base of baffle plate
P to the boxed in section T, and over the top at

P³ where the gap widens and circulation will take place. The back of the tank U will be the coolest part of the tank by reason of the air currents in section J, and condensation will take place there, and away from the whole area of perforated plate B.

Condensed liquid is allowed to run out through pipe V, and will drain away from the bottom of tank A, as shown in the drawings.

I declare that what I claim is:

1. Apparatus for developing photographic sensitized layers by moist ammonia or other vapour comprising a D shaped developing chamber having a perforated curved surface, an inner baffle plate fitted adjacent to and spaced from said surface, a single electric heater of rectangular form disposed between said baffle plate and said curved surface and adapted to conform in curvature to said surface and an endless band adapted to move said layers over said surface.

2. Apparatus for developing photographic sensitized layers by moist ammonia or other vapour comprising, an outer casing, a D-shaped developer casing disposed in spaced relation within said outer casing and presenting upper and lower generally horizontal leg walls and a generally vertical standard wall and a generally vertically disposed convexly curved and perforated layer supporting and developer surface, a travelling belt for holding layers against and conveying them downwardly over said curved surface, an inner baffle plate disposed in generally parallel spaced relation to said curved surface and having an extension lying above and generally parallel to the lower leg wall of the D-shaped casing and extending upwardly opposite the standard

wall of the D-shaped casing to form an ammonia retaining trough, heating means in the spaces between the inner baffle and its extension and the curved surface and the lower leg wall of the D-shaped casing for vaporizing the trough contained ammonia and causing vapour thereof to rise by convection current in contact with the curved surface, and means for inducing an air current over said lower leg wall and said standard wall to cause them to be much cooler than the curved surface so that condensation will take place on said leg and standard walls and not on said curved surface.

3. An apparatus as defined in claim 2, in which the lower leg wall of the D-shaped casing slopes downwardly toward the standard wall to form a condensation collection trough, and in which there is included means for drawing off condensation from said collection trough.

4. An apparatus as defined in claim 2 in which said heating means is generally rectangular in shape and includes a leg portion at each end of the D-shaped casing above the lower leg wall thereof, an end leg extending upwardly in curved generally parallel relation with the curved surface at each end of the D-shaped casing, and a horizontal leg connecting the upper ends of the end legs and generally paralleling the curved surface.

5. An apparatus as defined in claim 2 in which there is included an additional baffle wall partially enclosing the space between the generally horizontal extension of the inner baffle and the lower leg wall of the D-shaped casing.

SYDNEY HAROLD MORSE.