

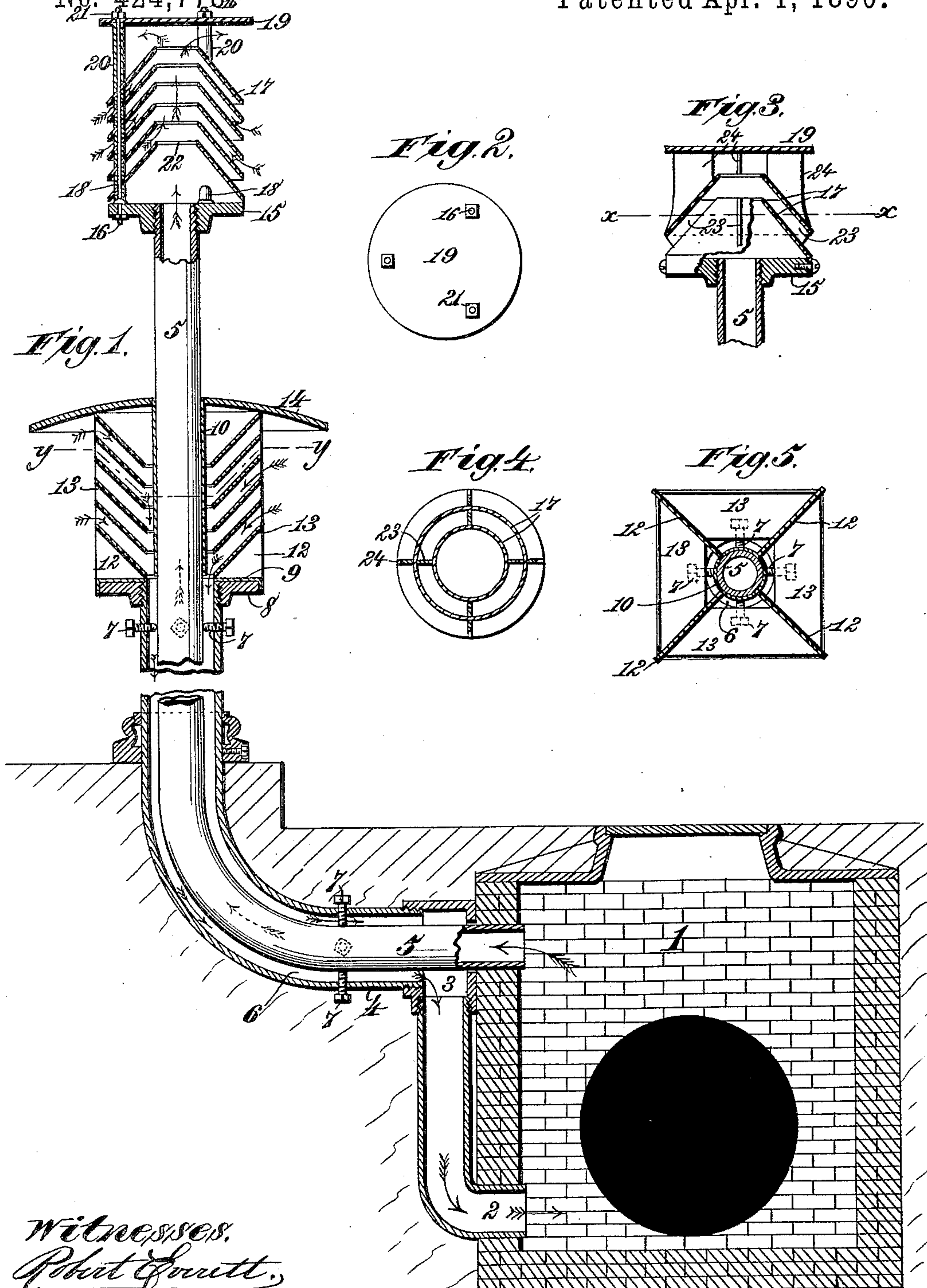
(No Model.)

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VENTILATING SYSTEM FOR ELECTRIC SUBWAYS.

No. 424,778

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UNITED STATES PATENT OFFICE.

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VENTILATING SYSTEM FOR ELECTRIC SUBWAYS.

SPECIFICATION forming part of Letters Patent No. 424,778, dated April 1, 1890.

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To all whom it may concern:

Be it known that I, WILLIAM GEE, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Ventilating Systems for Electric Subways, of which the following is a specification.

My invention relates to systems of ventilation for underground conduits, and especially for the man-holes and subways used in connection with electric systems of communication and illumination.

It is the purpose of my invention to provide means whereby a constant current of ventilation may be supplied to the man-holes and subways of this class without depending upon motive power or upon the movement of the atmosphere.

It is one purpose of my said invention, however, to so construct the apparatus I employ that its action shall be aided and intensified by the winds and breezes, although not dependent thereon.

It is a further purpose of my invention to so construct the apparatus that it may serve both as a support for an arc or other light as well as a guide and container for the wires supplying the same, while it may also be utilized as a support for the designation of streets and for similar purposes.

The invention consists in the several novel features of construction and new combinations of parts, hereinafter fully set forth, and then definitely pointed out in the claims following this specification.

In the accompanying drawings, Figure 1 is a central vertical section of a ventilating apparatus embodying my invention and shown in connection with the man-hole of a subway or conduit. Fig. 2 is a plan view of the upper portion. Fig. 3 is a partial section, taken in a central vertical plane, showing a modified construction. Fig. 4 is a horizontal section taken in the plane xx , Fig. 3. Fig. 5 is a horizontal section taken in the plane yy , Fig. 1.

In the said drawings, the reference-numeral 1 designates the man-hole of any ordinary subway or conduit, provided with the usual means of access. Entering the man-hole at or near its bottom is a pipe 2, of suitable di-

ameter, its end set in the masonry and carried through the same. The main portion of the pipe is carried upward near the wall of the man-hole to a connection or box 3, which it enters. Connecting with this box 3 is a pipe 4, of greater diameter than the pipe 2. This pipe 4 is curved gently into an upright position and emerges from the earth near the curb of the pavement, or at any other suitable point, being prolonged to extend a few feet above the surface, as shown in Fig. 1. Arranged concentrically within the pipe 4 is a pipe 5, of such diameter that an annular space 6 is formed between its outer surface and the inner surface of the pipe 4. This pipe 5 passes through the box or connection 3, and also traverses the masonry of the man-hole, its end opening within the latter at or near its upper part. The body of said pipe is centered and sustained in the inclosing pipe 4 by means of set-bolts 7, tapped through the latter pipe and having their ends abutting against the inner pipe. These bolts are preferably four in number, though I may use more or less, and they may be located at as many different points as desired. The interior pipe 5 emerges from the open end of the pipe 4, and is carried vertically upward any desired number of feet above the same.

Upon the upper end of the pipe 4 is mounted a flange 8, upon which rests a plate 9, having its edges turned over the edges of the flange. A sleeve 10, fitting upon the projecting portion of the pipe 5, is connected with the plate 9 by means of four radial vertical plates 12, which extend outward to the angles of the flange 8. Between these plates or wings 12, I arrange four series of parallel plates 13, their outer and broader edges extending between the vertical outer edges of the wings 12 and their body portions inclining downward and inward toward the pipe 5, from which their narrower inner edges are separated by a space about equal to the width of the annular space between the pipes 4 and 5, as shown in Figs. 1 and 5. Surrounding the four series of these downwardly-inclined plates and resting upon the sleeve 10 and upon the vertical wings 12 is a cover 14, which is preferably curved or concavo-con-

vex, its periphery extending out beyond the parts it covers. This plate serves to prevent the entrance of rain and snow and aids in collecting the air when the latter is in motion and directing it to the downwardly-inclined plates 13.

Upon the upper extremity of the projecting pipe 5, I mount a flange 15, surrounding the open end of the pipe. Through this flange near its outer edge are passed vertical rods 16, upon which are arranged a series of parallel deflectors 17, each resembling in form a frustum of a hollow cone open at both ends. The rods 16 pass through these plates, and the latter are sustained and separated from each other by means of short sleeves 18. A cover-plate 19 is mounted on the upper ends of these rods and supported by sleeves 20 of suitable length, nuts 21 being turned on the ends of the rods to clamp the entire structure together. The openings 22 in the truncated ends of the deflectors 17 permit the free passage of the air rising through the pipe 5, and during the prevalence of any breeze the air entering between the deflectors is driven upward and outward through these openings 22, thereby increasing the force of the upward current in the pipe, while in a similar manner the downward current in the annular space between the two pipes 4 and 5 is expedited by the action of the downwardly-inclined plates 13. The convergence of the vertical plates 12 also aids in producing this result, as the whole force of the air exerted upon the extended outer portions of the plates 13 is concentrated within the narrow space spanned by their inner ends or edges.

I may construct the deflectors 17 in the manner shown in Figs. 3 and 4, in which the truncated hollow cones are shown provided with vertical strips or plates 23, which separate the deflectors and also aid in diverting the air-currents upward and concentrating their force. The cover-plate, also, may be supported by strips or plates 24, united to the upper deflector 17.

The relative arrangement of the two pipes within the man-hole and of the inlet and outlet openings above ground gives rise to a gentle but constant current which flows through said tubes in the directions indicated by the arrows in Fig. 1. The air in the conduit or man-hole being cooler than the exterior air and the strata of air at the bottom being cooler than that above tends to set up a circulation, which is aided by the tendency of the lighter and warmer air in the pipe 5 to rise. In ordinary weather, when the parts are more or less affected by the warmth of the sun, the circulation will become quite rapid and is still further increased by the action of the wind, as already explained.

The protector-plate 19 may be utilized as a support for an arc lamp or other illuminator, and the wires supplying it may be carried thereto in the pipe 5, by which they will be

perfectly concealed and protected. The flange 8 may also be used as a support for a plate or plates giving the designation of the street.

This system of ventilation will keep the subways clear of moisture and gas and in a dry and healthy condition, thereby materially increasing the efficiency of the currents and the durability of the insulation.

The pipe 2 and the box or connection 3 may be arranged within the conduit instead of outside, if preferred, the connections being otherwise substantially the same as those shown and described.

What I claim is—

1. The combination, with a man-hole or subway, of two ventilating-pipes entering said man-hole or subway at top and bottom, respectively, one of said pipes being partially or wholly inclosed within the other and each opening at a different point above the surface of the ground or street, substantially as herein set forth.

2. The combination, with a man-hole and subway, of a pipe entering the former at or near the top, a pipe of greater diameter inclosing the same and rising to a suitable point above the earth, leaving an annular space between the two pipes, an inlet-pipe entering the man-hole at or near the bottom and communicating with the annular space, downwardly-inclined deflector-plates arranged to guide the wind and concentrate its force in the entrance to the said annular space, and a series of oppositely-inclined deflectors arranged above the end of the interior pipe, which opens above the point where the exterior pipe ends, substantially as described.

3. The combination, with a man-hole, of an inlet-pipe entering near the bottom and communicating with a box or connection arranged outside near the top of the man-hole, a pipe of large diameter rising above the earth at one end and communicating with the box or connection at the other, an interior pipe traversing the box and entering the upper part of the man-hole and centered in said large pipe by set-bolts, the end of said inner pipe rising above the termination of the surrounding pipe, a flange mounted on the latter and having vertical radiating plates, downwardly-inclined deflector-plates arranged between the radial plates, a series of upwardly-inclined deflectors, each having the form of a hollow truncated cone and arranged above the open end of the interior pipe, and cover-plates protecting both deflectors from rain and snow, substantially as described.

4. The combination, with a man-hole, of a pipe 2, entering near the bottom and communicating with a box 3 near the top and on the outside of the man-hole, a pipe 5, traversing the box and rising some distance above the earth, a pipe 4, surrounding the pipe 5 and communicating with the box 3, its end rising above the earth and terminating some distance below the end of the pipe 5, centering-

bolts tapped through the pipe 4 and sustain-
ing the pipe 5 to form an annular space be-
tween the two, a flange 8, having radial ver-
tical plates 12, downwardly-inclined deflector-
5 plates 13 arranged between the same, a cover
14, a series of hollow cone-shaped plates 17,
truncated at their upper ends and supported
by rods 16 and sleeves 18, and a cover-plate

19, mounted on said rods and supported by
sleeves 20, substantially as described. 10

In testimony whereof I have affixed my sig-
nature in presence of two witnesses.

WILLIAM GEE.

Witnesses:

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