(No Model.)

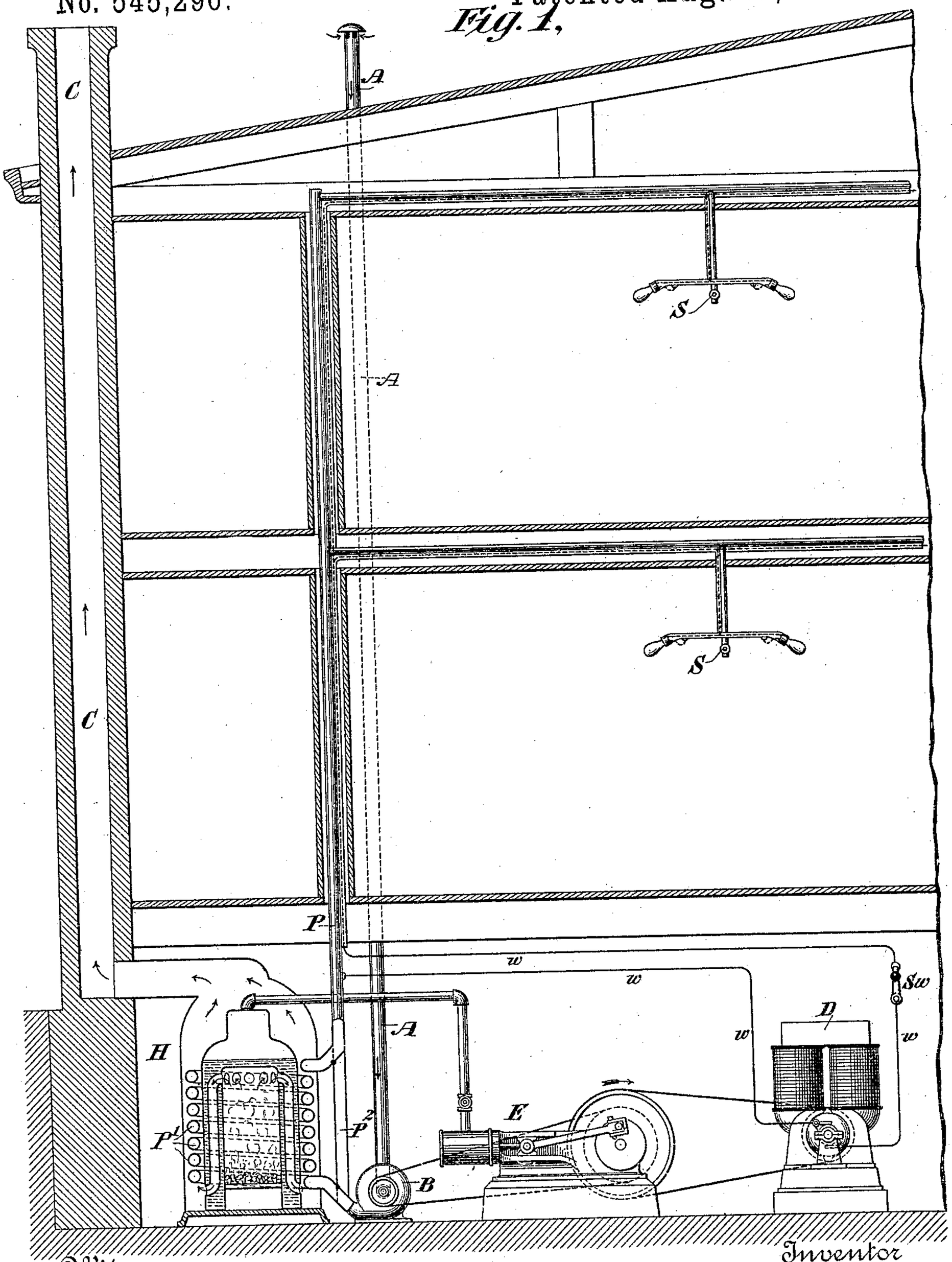
2 Sheets—Sheet 1.

C. J. KINTNER.

ELECTRIC CONDUIT.

No. 545,296. Patented Aug. 27, 1895.

Fig. 1.



Witnesses

C. E. Ashley

H. W. Lloyd.

Inventor

Charles J. Kintner

(No Model.) 2 Sheets—Sheet 2.

C. J. KINTNER.

ELECTRIC CONDUIT.

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Fig. 2,

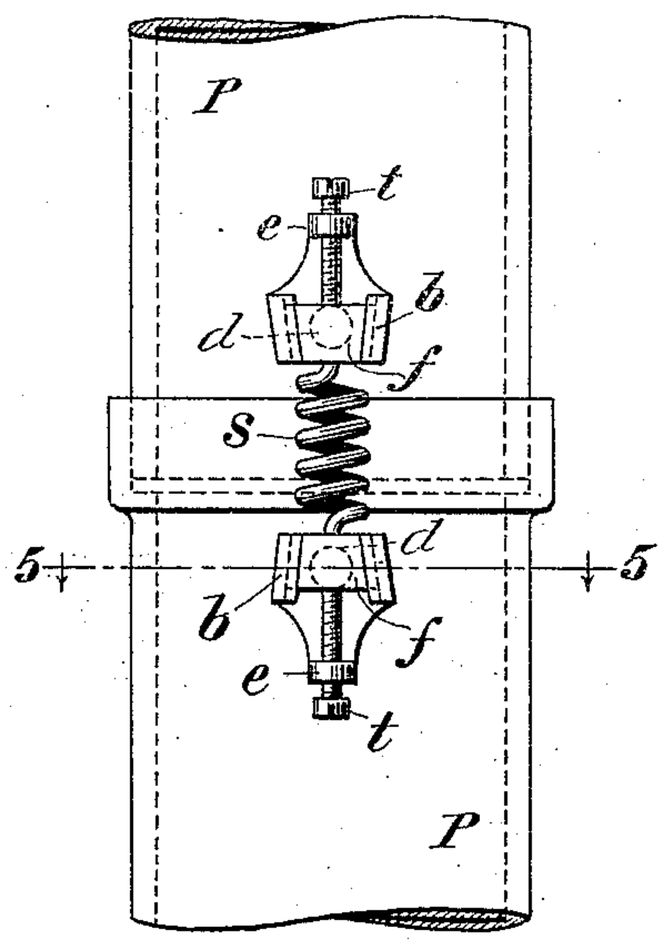


Fig. 4,

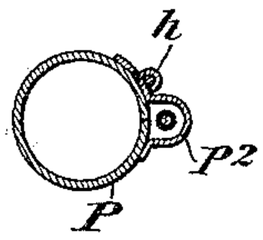


Fig. 3,

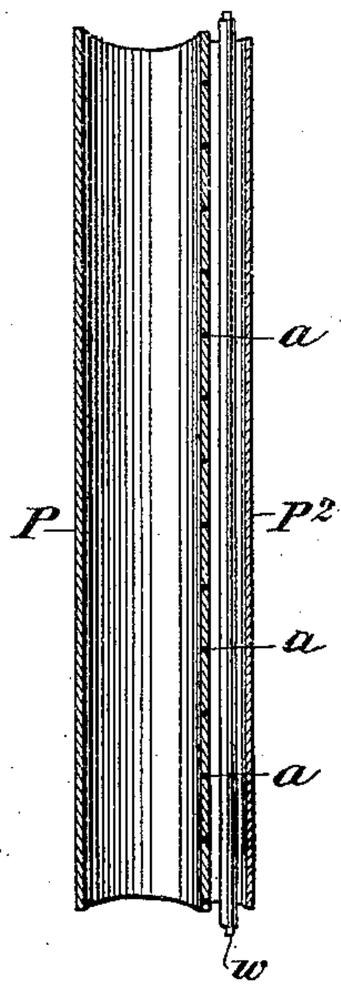


Fig. 6,

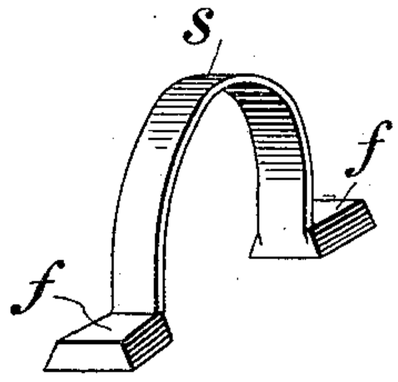
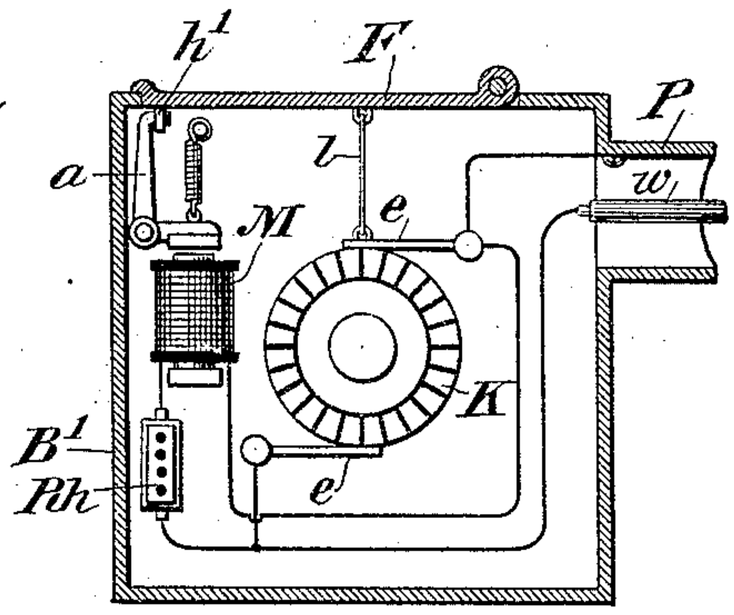


Fig. 7.



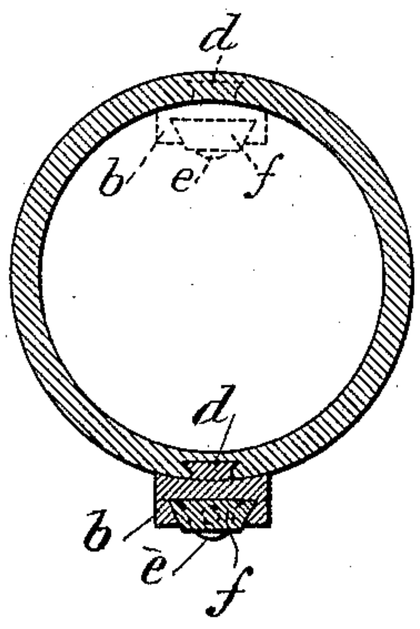


Fig. 5,

Witnesses
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UNITED STATES PATENT OFFICE.

CHARLES J. KINTNER, OF NEW YORK, N. Y.

ELECTRIC CONDUIT.

SPECIFICATION forming part of Letters Patent No. 545,296, dated August 27, 1895.

Application filed March 16, 1893. Serial No. 466,200. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. KINTNER, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a new and useful Improvement in Electric Conduits, of which the following is a specification.

My invention is directed particularly to improvements in electrical conduits known in the art as "interior" or "house" conduits, and it has for its objects, first, to insure absolute safety to persons and property; second, to render the insulation of systems of interior or house conduits more perfect; third, to make it possible to utilize the same system of conduits for the double purpose of electrical conduits and ventilating-tubes, thereby cheapening the cost of both and insuring a more perfect insulation in the use of the former; fourth, to afford a more perfect union between adjacent sections of conducting conduit-tube; fifth, to surround the conducting portions of the dynamo or generator with a protecting-casing, which shall prevent any possibility of an accident to the attendant or any other person during the time that that machine is running; sixth, to accomplish all of the functions necessarily attributable to the entire apparatus hereinafter described, for a full and clear understanding of which reference is had to the accompanying drawings, in which—

Figure 1 is a vertical sectional part elevational view taken through a building, illustrating an electrical-illuminating-plant for the building with my improved system of conduit and ventilating or heating tubes. Fig. 2 is a cross-sectional view of the preferred form of combined ventilating or heating and conduit tube used by me; and Fig. 3 is a longitudinal vertical sectional view of a short section of the same tubing, showing the interior or return conducting-wire in position. Fig. 4 is an elevational view of the adjacent ends of a pair of conduit-tubes held together by my improved detachable expansible connector; and Fig. 5 is a cross-sectional view taken through Fig. 4 on the line 5 5 and, as seen, looking in the direction of the arrows from the top toward the bottom of the drawings. Fig. 6 is a perspective view of a modified form of my improved expansible detachable connector; and Fig. 7 is a cross-sectional view of my improved protector for the conducting parts of a dynamo-electric machine, showing also a short portion of the concentric conduit and the inclosed main, the commutator of the machine being shown in elevation, the dynamo-machine itself not being shown.

Referring now to the drawings in detail, and first to Fig. 1, D represents a dynamo, E a steam-engine, H a boiler, and B a blower, all located in the basement of a building, the engine being connected by belting through pulleys to both the dynamo and the blower.

A is an air-pipe running from the top of the building directly to the blower B, which in turn is connected to a coiled pipe P′ around the steam-boiler H, the latter having the usual steam connections with the engine E and the customary chimney or smoke-stack C. The upper end of the coil-pipe P′ is connected to an upwardly-extending pipe P, of metal or other conducting material, running vertically through the upper stories of the building and provided with branches running beneath the floors or behind the wainscoting and connected to electroliers in various parts of the building.

w is a conductor connecting the pole of the dynamo D to the exterior surface of the main pipe P and the other pole thereof, through a switch S^w, to an insulated conductor located on the inside of the main pipe P, as shown in Fig. 3, the several branches being conveyed in the manner shown through outlying electroliers and connected to incandescent lamps or other translating devices having their opposite poles connected directly to the outer casings of the electroliers or conduit-tubes P. These pipes P and their subordinate branches, together with the main pipes of the electroliers, should be of such dimensions as to convey the required amount of heated air for heating the rooms or of cold air for ventilating them.

S S are stop-cocks, located at the bases of the electroliers for admitting the hot or cold air into the rooms.

P^2 is a branch pipe which shunts the coiled pipe and is provided with any well-known form of dampers for this purpose, so that the air from the exterior of the building may be forced either through the coiled pipe P′ and

heated or may be forced directly through the branch P^2 and the building supplied with cold air.

In the form of conduit shown in Figs. 2 and 3, which is the preferred form, the main or air-conducting portion P is separate from the portion P^2, the latter being hinged to the former by hinges *h* and provided with air-inlets *a* of sufficient size to admit of the free circulation of air in this portion of the conduit. If preferred, the conductor *w* might be placed directly in the main conduit P, which would consist of an ordinary metallic pipe running throughout the building, the joints all being of such a nature as to insure good conductivity.

I may provide means for closing the apertures *a* in the nature of a sliding damper, so that when it is desired to replace or repair the conductor *w* the draft or flow of air in the ventilating portion will not be affected.

It will be readily appreciated by those skilled in the art that owing to the expansibility of metal tubing good electrical conducting-joints between the ends of the tubes cannot be maintained. I have therefore devised an expansible detachable connector for joining successive sections of tubing together, as shown in Fig. 4, wherein *b* is a metallic lug, preferably of copper, having a beveled or dovetailed extension *d* extending into the body of the conduit-tube, said lug being located in position in the mold at the time the pipe is cast, so that the extension *d* constitutes an integral part of the pipe. This lug *b* has a dovetailed and beveled groove in its outer face, as clearly shown in Fig. 5, adapted to receive a corresponding beveled dovetailed extension *f*, which in turn is integral with a spiral-shaped conductor *s* of large conducting capacity, there being, as clearly shown in Fig. 4, a corresponding dovetailed extension *f* on the other end thereof adapted to fit in a lug *b*, secured to the end of the adjacent pipe, the same as was the first-named lug *b*.

t and *t* are adjusting-screws in the upturned ends *e* of the lugs *b b*, the screws being adapted to bear against the outer faces of the dovetailed extensions *f* and force them firmly into position, so as to make good electrical connection between the parts *f* and *b*. After the pipes are located in alignment these expansible detachable conductors may be sprung into place and a good conducting-joint secured by turning the screws *t* so as to force the beveled portions firmly against the inner dovetailed shoulders. The lugs *b* and also the intermediate expansible connector *s* and the parts *f* may be, if preferred, located on the inside of the conduit-tubes, as shown in dotted lines in Fig. 5, and there may be two or more pairs of such connectors between each pair of pipes. The spiral form of the connector *s* may be a simple loop with enlarged dovetailed and beveled ends *f*, as clearly shown in Fig. 6.

My improved protector for the exposed parts of the dynamo-machine is shown in Fig. 7, in which B′ is a metallic box electrically secured to the main or conduit pipe P and wholly surrounding the commutator K and commutator-brushes *e*. *w* is the current main connected to one of the brushes *e*, the surrounding conducting conduit-tube P being connected to the other brush *e*. M is an electromagnet inclosed in the box B and secured thereto, said magnet being in a derived circuit to the working circuit and including the necessary adjustable rheostat R^h for regulating the amount of current required to operate it. *a* is an armature-lever, the free or hooked-like end of which is adapted to enter a metallic loop or eye *h′*, secured to the under face of a door or lid F, the arrangement being such that when the dynamo is running and all of the translating devices receiving their necessary current-supply the armature-lever *a* of the electromagnet M is caused to securely lock the door or lid F, so that access to the conducting portions of the machine by the attendant or any other person is not possible. The commutator-brushes *e e* may be provided with the usual shifting devices accessible through means not inclosed in the box F—that is to say, these brushes may be attached to the necessary brush-rocker extending into the box and in such manner that there is no possibility of current-shock to an attendant while shifting the brushes. With such an arrangement I am enabled to make the entire system from the generator to the lamps or other translating devices self-inclosed, so that there is no possibility of a dangerous shock to any one at any point whatever. As soon as the generator is stopped the armature-lever *a* falls back and the lid F of the protecting-casing *b* may be lifted and access had to the commutators. If desired, the lid F may be attached directly to one of the commutator-brushes *e* by a connecting-link *l*, so that when it (the lid) is raised it will lift the brush from the commutator, thereby preventing the attendant from starting the generator when the lid is open and insuring safety to him.

I am aware that it is broadly old to increase the insulating capacity of a conduit by forcing heated or dry air through it, and I make no claim hereinafter broad enough to include such a structure. I am not aware, however, that any one has heretofore so combined a system of hot or cold air pipes with electrical conductors that increased insulating capacity is effected and ventilation or heating of the rooms simultaneously accomplished. Such a system insures much better insulation and a simple, cheap, and efficient method of ventilation, thus placing the lighting and heating of the apartments at a common or central point. Such an arrangement also affords other useful ends in the arts—as, for instance, a supply of air under pressure wherever electric translating devices are located—and my claims contemplate, broadly, all such uses.

To illustrate, air under pressure at translating devices might be used in connection with electric welding apparatus, electric soldering apparatus, electric furnaces, or in any analogous way.

I do not limit myself to any special form of conducting pipes or tubes, nor to any particular arrangement or location of the interior conductor when combined with means for forcing air through the tubes to the electrical translating devices, as I believe that such a combined system of electrical and ventilating apparatus is broadly new with me. Nor do I limit myself to the use of a dynamo-electric machine, as any electrical generator may be substituted therefor.

It is also obvious that dampers or other apparatus for regulating the flow of the air may be located at various points throughout the system, and that the conduit-tubes may be provided with removable covers in order to afford easy access to the interior conductors, and that the blower may be driven by any source of power—as, for instance, a water-motor or where the source of electrical supply is apart from the building—and where more than one of such motors are used they may be located at various parts of the building—as, for instance, at the branch tubes on the various floors, or any such place as will be naturally suggested to the constructor.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A system of interior or house conduits, in combination with means for forcing air through said conduits and additional means located near electrical translating devices for regulating the flow of air at points near said translating devices whereby improved insulation is effected in the conduits, substantially as described.

2. A system of interior or house conduits consisting of a main and one or more branch tubes inclosing main and branch conductors in combination with electric translating devices, a blower for forcing air through the tubes and means located near the translating devices for regulating the flow of air into the room or rooms where they are located whereby improved insulation is effected in the conduits, substantially as described.

3. A system of interior or house conduits consisting of main and branch tubes inclosing main and branch conductors in combination with a dynamo electric machine operatively connected to the main tube and its inclosed conductor, a blower, a steam boiler, an air inlet pipe, a heating tube and a steam engine adapted to drive both the blower and the dynamo whereby improved insulation is effected in the conduits, substantially as described.

4. A system of interior or house conduits consisting of a main and branch tubes inclosing respectively a main and branch conductors, translating devices operatively connected to the branch tubes and their inclosed conductors, means located near the translating devices for regulating the flow of air, a dynamo electric machine operatively connected with the main tube and its inclosed conductor and a blower having connection with an inlet pipe and the main tube, the blower and the dynamo being driven by a common source of power whereby improved insulation is effected in the conduits, substantially as described.

5. A combined system of interior or house conduits and air conveying tubes consisting of main and branch tubes having supplemental or side tubes which inclose main and branch conductors, said compound tubes being provided with intervening openings, substantially as described.

6. A combined system of interior or house conduits and ventilating or heating apparatus consisting of compound or double tubes provided with intervening openings, one portion of the compound tubes inclosing insulated conductors and the other being adapted to convey air under pressure, substantially as described.

7. A combined system of interior or house conduits and ventilating or heating apparatus consisting of double tubes having intervening openings, substantially as described.

8. A combined ventilating and conduit tube consisting of a main tube for conveying air and a side tube hinged thereto for inclosing an insulated conductor whereby improved insulation is effected in the conduits, substantially as described.

9. A combined ventilating and conduit tube consisting of a main tube for conveying air and a side tube inclosing an insulated electrical conductor whereby improved insulation is effected in the conduits, substantially as described.

10. A pair of conducting conduit tubes, a conducting lug integral with each tube and an expansible connector detachably secured to each lug, substantially as described.

11. A pair of conducting conduit tubes having their ends in alignment and each provided with a conducting lug and a detachable expansible connector secured to said lugs, substantially as described.

12. A pair of conduit tubes having each a conducting lug at its end, in combination with an expansible connector provided with means for uniting it to the adjacent lugs, substantially as described.

13. A dynamo electric machine having its commutator brushes inclosed in a protecting casing, in combination with means controlled by the current supply for keeping the casing closed, substantially as described.

14. A dynamo electric machine having its current collecting brushes wholly inclosed by a casing having a door provided with means for locking it and means controlled by the

current from the machine for keeping said door locked while machine is running, substantially as described.

15. A dynamo electric machine having its current collecting brushes inclosed in a casing provided with a door for affording access to the brushes, in combination with an electro-magnetic locking device adapted to lock the door while the machine is in operation, substantially as described.

16. A dynamo electric machine provided with a protecting casing for the current collecting brushes and mechanical connections between the door and one of the brushes for lifting it out of contact with the commutator when the door is open, in combination with electro-magnetic means for keeping the door locked while the machine is in operation, substantially as described.

17. In a system of electrical distribution a series of concentric conductors running from the generator to the translating devices, in combination with a protecting casing which surrounds or incloses the current collecting devices of the generator, whereby the entire system is rendered safe from accidental shocks, substantially as described.

18. In a system of electrical distribution a current main inclosed in and insulated from a surrounding concentric conducting current main, one or more translating devices located in one or more concentric branch mains and a protecting casing surrounding the current collectors of the generator, substantially as described.

19. In a system of electrical distribution a pair of concentric current mains insulated from each other and operatively connected through current collecting devices with a generator of electricity, in combination with a protecting surrounding casing for the current collecting devices.

20. A pair of concentric current mains insulated from each other and connected to the current collecting devices of an electrical generator, in combination with a surrounding protecting casing for the current collectors, said casing being provided with a door or other means of access to the current collectors and an electro-magnetic locking device adapted to lock the door while the generator is running, substantially as described.

In testimony whereof I have hereunto subscribed my name this 15th day of March, 1893.

CHARLES J. KINTNER.

Witnesses:

M. M. ROBINSON,

E. W. FITZGERALD.