

cone *d* of the holder or clamp, for the pen *f*, (Figs. 1, 2, 3,) or by means of the rod or spindle *g* (Fig. 10) of the angularly bent sliding rod *h* (Fig. 11), and the cone *g*, substantially as and for the purpose hereinbefore set forth. 2nd. The application and employment of the coiled spring *a*, which is so provided with a rear extension *l* that the same can be used in ordinary holders (Figs. 4 and 5), substantially as and for the purpose hereinbefore set forth. 3rd. The combination of the spring *a*, pen *f* and extension *l*, said parts being made from one piece of metal (Figs. 6 and 7), substantially as and for the purpose hereinbefore set forth. 4th. The application of the helical spring *a*, for holding the pen *f* by inserting the same between the alternately depressed coils, and also for receiving the stem handle or holder *c*, substantially as and for the purpose hereinbefore set forth. 5th. The arrangement of the cylindrical holder or clamp *K* with long leaf spring *L*, which latter is attached to the holder *c* by means of the springs *r* (Fig. 12), all substantially as and for the purpose hereinbefore set forth.

No. 25,695. Method of and Apparatus for Ventilating Hats, Helmets, etc. (*Mode de Ventilation des Chapeaux, Casques, etc., et appareil pour cet objet.*)

Charles Potter, Stockport, Eng., 11th January, 1887; 5 years.

Claim.—1st. In a hat or other head covering, the combination of the fan *a*, with the pendulum *b*, in such a manner that the pendulum *b* is set in motion by the constant movements of the head, and actuates the fan *a* either directly or indirectly, all substantially as set forth and for the purpose specified. 2nd. In a hat or other head covering, the valve *c* or slide *n*, for the purpose of regulating the admittance of air employed inside the frame or casing *c*, or air inlet *h* respectively, in direct combination with the fan and pendulum mechanism *a* and *b*, or air inlet *h* respectively, substantially as set forth.

No. 25,696. Bath Tub. (*Baignoire.*)

Frank B. Day, Jackson, Mich., U.S., 11th January, 1886; 5 years.

Claim.—1st. The combination of the bath tub of ordinary internal construction, of an external shell extending beneath the bottom and up the sides of the tub, of burners arranged at intervals at openings in the said external shell, whereby heat is applied directly to the bottom of the bath tub, and pipe connections from said burners to the reservoir for supplying the fuel, all substantially as described. 2nd. The combination of the bath tub of ordinary internal construction, of an external shell extending beneath the bottom and up the sides of the tub, of burners arranged at intervals at openings in the said external shell, whereby heat is applied directly to the bottom of the tub, pipe connections from said burners to the reservoir for supplying the fuel, and an auxiliary tank connection to the bath tub having a pipe connection, the said auxiliary tank having a false bottom, and burner placed in the opening thereof and connected to the reservoir, all substantially as described.

No. 25,697. Index. (*Index.*)

The Schlicht and Field Company, Toronto, Ont., (Assinee of Paul J. Schlicht, Rochester, N.Y., U.S.), 11th January, 1887; 5 years.

Claim.—1st. An index table having a series of columns headed by the first two or more letters of surnames in divisions, in the alphabetical order of succession, a series of intersecting columns headed by the first letters of given names alphabetically arranged, and page indicating numbers at the points of intersection, in combination with a name-book pagged to correspond with the index-table, substantially as described and shown, whereby the names bearing like initials are subdivided into smaller groups to the end, that the searcher may instantly select the particular name acquired. 2nd. An index table having columns headed by the first two or more letters of surnames in divisions, in alphabetical order of succession, a series of intersecting columns headed by an indicating letter of given names alphabetically arranged, and page indicating numbers at the points of intersection, in combination with a name-book pagged to correspond with the index table and divided into sections, in the manner described and shown, whereby the names bearing like initials are subdivided into the smaller groups to the end, that the searcher may instantly select the particular name required. 3rd. An index table for compound names, that is to say, those composed of christian and surnames having a column containing the first two or more letters of one name, another column containing the first letter of the other name, and page indicator numbers in line with both columns, substantially as described, whereby names of the same initials are subdivided into different groups or classes according to the letters following said initials.

No. 25,698. Electric Conductor.

(*Conducteur d'Electricité.*)

John J. Williamson, Boston, Mass., U.S., 11th January, 1887; 5 years.

Claim.—1st. A compound ingot having a core of malleable metal of high electric conductivity and comparatively low fusing temperature, such as is herein described, inclosed on its side or sides and ends by a malleable tenacious metal of lower electric conductivity and comparatively high fusing point, substantially as and for the purposes described. 2nd. In the preparation of compound ingots of malleable cast metal exterior and copper centre for the manufacture of electric conductors, the improved method of preparing the interior of the steel envelope for the reception of the core consisting of the removal of sand-scale and the application of a carbonaceous wash or of the equivalent of such manipulations, substantially as described. 3rd. The method of producing electric conducting wires composed of copper and copper alloys, by casting or pouring molten fluid copper or copper alloys to and around a solid bar, substantially as herein specified, or within a hollow ingot of copper or copper alloys, as herein indicated, and afterwards heating such ingot and reducing such ingot by rolling and drawing to the diameter proper for electric

cal conductors, all substantially as and for the purposes described. 4th. The electrical conductor consisting of the core of copper and the envelope of iron or steel, when made substantially as specified, and possessing the properties herein set forth. 5th. A compound electric conductor of copper and an alloy of the character herein specified, all substantially as described. 6th. The method of making copper-cored steel or iron-enclosed electric conductors, herein described.

No. 25,699. Air and Gas Engine.

(*Machine à Air et à Gaz.*)

Stephen Wilcox, Brooklyn, N.Y., U.S., 12th January, 1887; 15 years.

Claim.—1st. The combination, with a gas engine, in which compressed air is admitted to the working cylinder and fired, of a charging device for saturating the air with an inflammable liquid, a variable cut-off valve and an igniter to inflame the charge capable of adjustment, to act coincident with the closing of said cut-off valve. 2nd. In combination with an air or gas engine, in which the combustible gases are fired in the working cylinder, a charging device for injecting an inflammable fluid, operated and adjusted substantially as described, to deliver said inflammable fluid at the latest movement of the induction valve, so that mixture with the admitted air takes place within the cylinder, coincident with, or subsequent to the closing of said valve. 3rd. In combination with an air or gas engine, in which combustible gases are fired in the working cylinder, a charging device for injecting an inflammable fluid operated and adjusted substantially as described, to deliver a small quantity of the same during the opening movement of the induction valve, and to rapidly deliver a greater quantity or full supply during the closing movement of said valve, whereby the greater quantity of inflammable fluid entering the cylinder at the latest movement of the valve, is mixed with the preceding air admitted within the cylinder subsequent to the closing of said valve. 4th. In combination with an air or gas engine, in which combustible gases are fired, two charging pumps operated by a mechanism of differential movement, one of said pumps being adjusted to deliver a small quantity of inflammable fluid during the opening movement of the induction valve, and the other pump adjusted to rapidly deliver a greater or full supply during the closing movement of said valve, whereby the greater quantity of inflammable fluid, entering the cylinder at the latest movement, is mixed with the preceding admitted air after the induction valve closes. 5th. A receiver for air or gas engines, provided with a series of internal tubes connected with the exhaust pipe or passages of the working cylinder, the air space communicating with the delivery of the air compressing pump and directly with the induction passage of the working cylinder, whereby said tubes serve to heat the passing current of compressed air, and as stays to strengthen the construction. 6th. A working cylinder or valve chest head for gas engines, made hollow and fitted with stuffing boxes and hollow piston or valve rods, said hollow head forming a water space or jacket between the cylinder and stuffing box, whereby the packing is kept cool and protected from burning by an escape of the hot gases around said rods. 7th. In combination with an air or gas engine, in which combustible gases are fired in the working cylinder, an induction valve adapted to be disconnected from its opening mechanism at any desired part of the stroke, and suddenly closed by an independent auxiliary device, and a charging pump for injecting an inflammable fluid operating coincident with the closing movement of said valve. 8th. The combination, with a gas engine, in which compressed combustible gases are fired in the working cylinder, of an induction valve opened by a positive motion and adapted to be closed at any desired point of the stroke by an extraneous force, and an igniter acting coincident with the closing of said induction valve. 9th. A double-seated induction valve, located between the receiver and cylinder, to close the communication and resist the action of a preponderating pressure from either direction. 10th. An induction valve of the type or kind described, having its port extended directly through it, and its circumferential faces fitted to close the communication between both the cylinder and receiver, and to be cooled by exposure to the adjacent water-jacket when in an open position. 11th. The combination, with a gas engine, in which compressed combustible gases are fired in the working cylinder, of independent induction and eduction valves protected by water jackets, the induction valves adapted to resist pressure toward and from the cylinder, and to cut off at variable points of the stroke, and an igniter adapted to inflame the charge coincident with the closing of the cut-off. 12th. The combination, with a gas engine, in which compressed combustible gases are fired in the working cylinder, of a valve gear for positively operating independent induction and eduction valves, the induction valves being adapted to close at variable points of the stroke, and an igniter acting coincident with the closing of the induction valve, as set forth. 13th. The combination, with a gas engine in which compressed combustible gases are fired in the working cylinder, of independent induction and eduction valves protected by water-jackets, the induction valves adapted to resist pressure toward and from the cylinder, and capable of adjustment to cut off at variable points of the stroke, and a reversing gear for running the engine in either direction. 14th. An air or gas engine, having its burner secured between the nozzles or flanges of the working cylinder, and valve box, whereby it may be easily removed and replaced without disturbing other parts of the engine. 15th. An air or gas engine provided with a sliding igniter, operated by a motion coincident with the valve motion, and having its inclosing port between the burner and cylinder, whereby it is sure to encounter and fire the issuing vapor, and made capable of adjustment to act simultaneously with the closing of the cut-off at any desired point of the stroke. 16th. A double-acting air or gas engine, in which atmospheric air and an inflammable fluid are mixed and fired in successive charges, consisting of a working cylinder, an air compressing pump, a reservoir, containing atmospheric air under pressure, arranged between said pump and cylinder, and a charging device for injecting an inflammable fluid, said cylinder being fitted with suitable induction and exhaust valves, combined with a link motion for operating and reversing the same, and also operating said charging device. 17th. A double-acting air or gas engine, in which atmospheric air and an inflammable fluid are mixed, and fired in successive charges, consist-