and a series of circuit breakers controlling the flow of electricity in the before-mentioned circuits, of a movable record strip provided with means such as described for actuating the circuit breakers, whereby each item or combination of items represented upon said record strip are automatically distributed and recorded substantially as described. 6th. The improvement in the art of compiling statistics, which consists in first assigning to each item entering into the proposed series of compilations one or more designated points or spaces, secondly, forming a complete record of each individual or subject upon a single card by applying a circuit controlling index point or points to each space appropriated to or indicative of each separate item in the given series which pertains to the individual or subject, and finally feeding said cards successively to an apparatus operated by the index points on each card to designate the particular division to which it belongs, and depositing each card in a place or receptacle corresponding to the division thus indicated, substantially as described. 7th. The hereinbefore described improved system for compiling statistical matters, consisting essentially in the combination with a series of circuits and operating electro-magnets, and a series of pins controlling said circuits, of a series of separate record cards, each card bearing circuit controlling index points indicative of items characteristic of an individual or subject. 8th. The combination to form a system for compiling statistical matters, as hereinbefore described, of a series of separate cards, each card bearing a series of index points representing the items or characteristics of one individual or subject, an apparatus provided with a series of circuit controlling devices corresponding and co-operating with the index points on the cards, a system of electro-magnets connected to said pins or circuit controlling devices, and a series of operating electro-magnets forming part of said system, substantially as described. 9th. In a system such as described, the combination, with a record card or strip, circuit controlling devices, and a system of circuits connected thereto, of operating magnets controlled by said circuits, and a series of boxes provided with lids controlled by said operating magnets, substantially as described. 10th. In a system such as described, the combination, with separate record cards, circuit controlling devices co-operating with index points on the cards, a system of circuits, one or more boxes or receptacles for cards, a movable lid or section controlling the entrance to each box or receptacle, and actuating devices for the movable lid or section, said devices being controlled by the index points on the record cards to designate the proper receptacle for each card, substantially as described. 11th. In a system such as described, the combination, with the perforated record cards and a system of circuits controlled thereby, a bed plate and platen between which the cards are successively fed, a series of yielding pins mounted upon the platen, and a corresponding series of mercury cups in the bed plate, substantially as described. 12th. The combination, with a perforated record card, of a circuit closing device controlled by said record card, electro-mechanical counters in circuit with said circuit closing device, and an integrating device, substantially as described. 13th. The combination, with a perforated record card, of contact points adapted to form electric circuits through the perforations of said record card, electro-mechanical counters in circuit with said contact points, and an intergrating device adapted to transmit one or more electrical impulses to said counters according to the value of said record punch marks.

No. 30,903. Chimney Cap. (*Souche de cheminée.*)

Harald M. Hansen, Chicago, Ill., U.S., 8th March, 1889; 5 years.

Claim.—The chimney-pot C having notches *g* in its lower edge, in combination with the coping B consisting of sections provided with flanges *f*, and having an interior flange e^1, shoulder *e* and a lower inclined edge, substantially as and for the purpose specified.

No. 30,904. Steam Engine. (*Machine à vapeur*)

Franklin D. Child, West Newton, Mass., U.S., 8th March, 1889; 5 years.

Claim.—1st. In a steam engine or other motor, a cylinder provided with inlet and exhaust pipes, inlet and exhaust chambers communicating with said inlet and exhaust pipes respectively, annular inlet passages communicating with either end of said inlet chamber, annular exhaust passages communicating with either end of said exhaust chambers, and inlet and exhaust ports communicating respectively with said inlet and exhaust passages at either end of said cylinder, and so constructed and arranged as to admit steam or other motive force to, and exhaust it from, said cylinder on all sides thereof, in combination with ring valves at each end of said cylinder adapted to alternately open and close said inlet and exhaust ports, and having frustro-conical surfaces on the inside and a cylinder head at each end of said cylinder which is provided with an internally projecting frustro-conical extension, the sides of which are parallel with the inner sides of said valves, and are in contact therewith or nearly so when said valves have reached the extreme end of their movement toward the cylinder heads. 2nd. In a steam engine or other motor, a cylinder provided with annular inlet and exhaust ports at both ends thereof, ring slide valves in both ends thereof having seating surfaces parallel to the axis of the cylinder, and adapted to alternately open and close the said inlet and exhaust ports, and also provided with frustro-conical surfaces on the sides furthest from said ports, in combination with cylinder heads provided with frustro-conical surfaces opposed to and parallel with the frustro-conical surfaces of the valves. 3rd. In a steam engine or other motor, a pair of ring slide valves arranged one in each end of the cylinder, and each having a circular seating surface parallel to the axis of said cylinder, which valves are adapted to alternately open and close the ports of said cylinder, and are also provided with frustro-conical surfaces on the inside thereof, in combination with cylinder heads provided with frustro-conical surfaces opposed to and parallel with the frustro-conical surfaces of the valves.

No. 30,905. Fire Escape. (*Sauveteur d'incendie.*)

Charles W. Allen, Toronto, Ont., 8th March, 1889; 5 years.

Claim.—1st. In a fire escape, the combination of a ladder having its rungs pivotally connected with the stringers, one of the stringers being made fast and the other having attached to it means for raising and folding it against its fellow stringer and dropping it into position for use, brackets secured to the building and formed with a recess at each end adapted to receive said ladder open and having one of the stringers firmly secured therein, a lifting chain attached to the movable stringer and passing over pulleys into the interior of the building and secured to a lever, a lever for operating the lifting chain and securing it upon a slip hook, a cord for disengaging the lifting chain from the slip hook, and an alarm signal set in operation by the ladder falling into position for use, substantially as set forth. 2nd. In a fire escape, the combination of the flat bar stringers A, the flat bar rungs B, having twisted ends *b* pivotally secured between the stringer bars A, the shouldered riveted pivots C passing through the stringers and rungs, and the washers *c* between each stringer bar and rung, substantially as set forth. 3rd. In a fire escape, the combination of the stringers A, the flat rungs B having twisted ends pivoted between the stringer bars A, the shouldered riveted pivots C connecting said stringers and rungs, washers *c* between each rung, and stringer bar eyes *g* secured to said stringer bars, and hand rail G secured in said eyes, substantially as set forth. 4th. In a fire escape, the combination of the folding ladder A B, brackets D secured to a building and having a recess *d* in which one of the stringers of the ladder is permanently secured, and a recess d^1 to support the movable stringer when the ladder is open, the lifting chain H terminating in a ring I and secured to a lever, the friction pulleys H^1, H^{11}, H^{111}, H^{1111} over which said chain passes, the lever I^1 for operating said lifting chain, a hook I^{11} to engage the ring I, and the cord J attached to the end of said lifting chain and guided over a pulley J^1, substantially as set forth. 5th. In a fire escape, the combination of the folding ladder A B, brackets D having a recess d^1, an electric circuit *k* having in it a battery and bell, and provided with a contact maker K placed in said recess d^1, and adapted to be pressed by the movable stringer of the unfolded ladder, substantially as set forth. 6th. In a fire escape, the combination of the folding ladder A B, brackets D having recesses *d*, d^1 and having one of the stringers A secured in said recess *d*, a cord or chain F passing over a pulley *f* and having suspended thereon a weight F^1, substantially as set forth. 7th. In combination with the folding ladder hereinbefore described, and secured at one side of a window, a balcony V secured to or near the window sill, substantially as set forth.

No. 30,906. Steam Injector.

(*Injecteur de vapeur.*)

Thomas J. Sweeney, Detroit, Mich.. U.S., 8th March, 1889; 5 years.

Claim.—1st. In a steam injector, the combination of the lifting valve H and the combining tube E, the lifting valve H being supported directly upon the combining tube, substantially as and for the purpose set forth. 2nd. In a steam injector, the combination of the lifting valve H, the combining tube E and its vacuum chamber and the lifting tube D, the lifting valve being supported directly upon the combining tube, and seated wholly by the action of the vacuum in the vacuum chamber *d* of the lifting tube or chamber, substantially as and for the purpose set forth. 3rd. In a steam-injector, the combination of the integral delivery-tube F and combining tube E and the valve H, the washer or ring e^1, the overflow chamber c^1 and the flange f^4 on the overflow chamber, said combining and delivery tube resting against said flange, the combining tube having unenclosed spill apertures e^2 and a shoulder F^1 carrying the valve H, substantially as set forth.

No. 30,907. Boot. (*Botte.*)

Benjamin F. Whitney, Portland, Me., U.S., 8th March, 1889; 5 years

Claim.—The shoe, having the usual heel and outer sole, vamp and quarter, and the inner sole B turned up all round its edges, and supporting the upper, thus dispensing with the usual heel-stiffening.

No. 30,908. Plough. (*Charrue.*)

Garland B, St. John, Kalamazoo, Mich., U. S., 8th March, 1889; 5 years.

Claim.—1st. In a plough, substantially as described, the combination of an iron or steel beam, composed of two straight parallel bars with intervening thimbles, and connecting bolts or rivets passing through said bars and thimbles, and iron or steel handles, substantially as described, secured to the rear end of the beam, whereby the connection of the two parts of the beam at the rear end is utilized in securing the handles thereto, and the parts are made cheaper and stronger, as described. 2nd. In a plough, substantially as described, the combination with the hand-lever of the rear axle and the shifting mechanism of the forward axle, of a secondary lever, a notched quadrant therefor pivoted to said rear lever, and a rod or bar connecting said secondary lever with the shifting mechanism of the forward axle and movable upon said quadrant, whereby both of said axles may be shifted simultaneously, or the forward axle independently of the rear one, and its position fixed at any desired point. 3rd. In a plough, substantially as described, the combination of the hand-lever 11, the connecting-rod 18, the hand-lever 19, the notched quadrant 20 and the slotted guide 21, substantially as and for the purpose set forth. 4th. In a plough, the combination, with tilting-arm which supports the forward wheel and the hand-lever, and connection with said tilting arm, substantially as described, of a castor-standard having a notched plate adapted to receive a suitable holder, a holder adapted to automatically engage with said notch, substantially as and for the purpose set forth. 5th. In a plough, the combination, with a suitable support therefor, of a castor-standard for the forward wheel, a cam on said standard, substantially as described, with a notch therein to receive the traveller of a spring, a spring substantially as described, with a traveller mounted in its free end and bearing on the periphery of said cam and adapted to engage with the notch therein and hold the castor in normal position, as set forth. 6th. In a plough, the combination, with a tilting arm of the bifurcated bracket 23, the spring 26 mounted between the members of said bracket and having traveller 27, the castor-standard 24 and the