with the scroll *a* having opening *a6* provided with the ring *b*, the inner end of which projects into the chamber of the scroll, of the hub *e* provided with the curved arms *e4*, the under ends of which project through the ring *b* and having the wings *e5* secured to the outer ends of the arms *e4* and provided with the guide grooves F.

No. 11,750. Improvements on Stone Cutting Machines. (*Perfectionnements aux machines à tailler la pierre.*)

Samuel B. Frank, Charles B. Wheelock, Isaac Reese and John A. Ward, Nashville, Tenn., U. S., 11th September, 1880; for 15 years.

Claim—The revolving disc A, provided with a series of peripheral rotary cutters D, and with rotary cutters E interposed between the cutters D, and having a rotary cutting action at right angles to that of the cutters D, whereby with the cutting of the channel, its sides are simultaneously subjected to a cutting action completing its formation at one operation.

No. 11,751. Improvements on Telephones. (*Perfectionnements aux téléphones.*)

Michael D. Connelly, Philadelphia, Pa., Thomas A. Connelly, Washington, D. C., and Thomas J. McTighe, Pittsburg, Pa., U. S., 11th September, 1880; for 5 years.

Claim. 1st. An automatic telephone exchange or series of independent lines having means for electrical communication with each other, and combined with mechanism controlled from the different stations, and adapted to automatically establish communication between any disengaged pair, at any and all times, while securing individual privacy between each pair. 2nd. An automatic telephone exchange comprising a series of three or more converging independent lines, on a central connecting apparatus so constructed and arranged that any member of the exchange may, while others are engaged and upon his own individual station, place himself in direct communication with any disengaged member of the exchange. 3rd. A coupling or connecting instrument for converging telephone lines, operated automatically by currents controlled from distant stations, and provided with devices whereby any two independent lines may be directly coupled or connected to the exclusion of all others from the same circuit, while permitting the establishment of separate circuits between the lines so excluded. 4th. An electro-automatic central apparatus for telephone exchanges, provided with a step by step action or progressive movement for establishing the coincidence of selected lines, and a shifting conductor by which coinciding lines may be isolated or rendered independent of others in the exchange, and means for permitting the free intercommunication of the latter. 5th. A series of independent telephonic lines converging to a central office or intermediate station, in combination with connecting mechanism located at the point of convergence, and capable of being automatically so manipulated through such lines that any one of said lines may, at all times at will, be placed in electric circuit with any other disengaged circuit of the series. 6th. A series of independent telephonic lines converging to a central office or intermediate station, in combination with connecting mechanism located at the point of convergence, and capable of being automatically so manipulated through such lines that all, or any number of said lines may be placed in electrical circuit in pairs at the same time. 7th. A telephonic exchange system consisting of a number of circuits converging from distant stations to a central office, an instrument located in the central office and containing electro mechanical devices placed respectively in said converging circuits, and adapted to connect any or all of said circuits in mutual contact, in pairs, simultaneously, and suitable means at each of the stations for putting said electro-mechanical devices in operation. 8th. The method of perfecting inter-connection of independent lines in a system of telephonic circuits in which each line is dependent upon a single circuit by the operations of the normal and reversed currents from local batteries, the normal current being employed to bring the two lines into contact, and the reversed current to isolate the circuit so established from all others of the system. 9th. The method of restoring the normal relations of two connected lines, in a system of telephonic circuits, which have been electrically connected by reversing the current, consisting in restoring the current to its normal direction and thus causing the electro-mechanical connecting devices to resume their original position, whereby the connection is severed, and the two lines are brought to their normal condition. 10th. A system of independent telephonic circuits converging to a central office, a movable electro-magnetic switching device forming the terminal of a given line, in combination with a series of conductors respectively forming the terminals of the other lines of said system, a step-by-step action to effect coincidence of lines, a make and break mechanism at the distant station of the given line, and an electric generator, whereby the successive pulsations produced in the given line effect the progressive contact of said switching device with the other terminals. 11th. In a system of independent telephonic circuits converging to a central office, the method of securing privacy between any two communicating stations with reference to all other lines, consisting in removing or disconnecting, by means of an electrical current controlled at either of said stations, any or all of the devices through which any other station should communicate therewith. 12th. In a device for establishing inter-communication between separate and independent lines of a system of telephonic circuits, the combination with a travelling pointer whose movements are responsive to the intermissions, of a distantly controlled rheotome and which forms a medium of communication between a given line and a line selected from the others of the system, of a conductor or in constant contact with said pointer, the ground and an automatic switch which alternately shunts the current of the operative line directly to earth, and through said conductor to the line brought into connection therewith.

No. 11,752. Stove-Pipe Stone Mould. (*Moule de douille en pierre de tuyau de poêle.*)

Henry Wandby, Toronto, Ont., 14th September, 1880; (Extension of Patent No. 603.)

No. 11,753. Improvements on Vehicle Springs. (*Perfectionnements aux ressorts des voitures.*)

George B. Hamlin, Willimantic, Ct., U. S., 15th September, 1880; for 5 years.

Claim.—1st. The side-bar spring composed of two or more leaves A B, running parallel with each other their entire length and connected to shackles upon the side-bars of the vehicle. 2nd. The leaves A B and the yokes *b c d* between and upon each side of the leaves. 3rd. The leaves A B connected at their ends to shackles, and having yokes *b c d* between and upon each side of the leaves.

No. 11,754. Improvements on Electric Telephones. (*Perfectionnements aux téléphones électriques.*)

William F. Cook, Joy Mills, Pa., U. S., 15th September, 1880; for 5 years.

Claim.—1st. The case A with the mouthpiece B, diaphragm C, spring sustained bottom F and adjustable button H, with or without buttons D or I. 2nd. A telephonic instrument having a magnet and an insulated coil or volute, forming a disc or plate and capable of being vibrated toward and from said magnet. 3rd. The combination, in a telephone having a vibrating diaphragm, of a spring sustained button, an adjustable button and a button interposed between said spring sustained and adjustable buttons, said buttons being of carbon or equivalent material. 4th. In a telephonic instrument, a coil or volute of insulated wire rendered practically homogeneous by fastening the coils or convolutions together by an adhesive substance, or equivalent means, so as to form a diaphragm or plate capable of being vibrated in the neighbourhood of a magnet. 5th. The combination of a permanent magnet, a separate coil or volute of insulated wire, forming a disc or plate capable of being vibrated toward and from said magnet and independently thereof and a diaphragm P. 6th. The combination, in a telephonic instrument having a case N and magnet O, of a vibrating coil or volute P and diaphragms Q R on either side of said volute.

No. 11,755. Improvements on Combined Washers and Wringers. (*Perfectionnements aux laveuses-essoreuses.*)

Anthony W. Burke, Stayner, and Asa L. Burke, Orangeville, Ont., 15th September, 1880; for 5 years.

Claim.—1st. The provision to the suds box A having a corrugated or slatted bottom, of rollers B B journalled to the sides of the box. 2nd. The rubber D having side grooves E and held to oscillate by pins C projecting from the interior of the suds box A. 3rd. The provision to the rubber handle of pin G. 4th. The journal blocks I I sliding in grooves, in the wringer standards H H, and carrying the lower spring M and upper roller L, in combination with the lower roller J, spring-bar N and compression screw O. 5th. The combination of the tray Q with the washer and wringer.

No. 11,756. Improvements in Tailors' Measures. (*Perfectionnements aux mésures des tailleurs.*)

Robert G. McLellan, Guelph, Ont., 15th September, 1880; for 5 years.

Claim— The disc A with scale B or distance eyelets, plummet C, bar strap E and strap H with marking strip. 2nd. The rule B with scale marks or distance eyelets, and position of bar G corresponding to those on the disc A for laying off ascertained measurements.

No. 11,757. Improvements in Dyeing Process. (*Perfectionnements dans les procédés de teinture.*)

Ernest Posselt and Rudolf Peters, Bradford, Eng., (Assignees of Jules J. Leloir, Tourcoing, France.) 15th September, 1880; for 5 years.

Claim.—1st. The employment for dyeing the warps and wefts of woven textile fabrics (cotton and worsted) of the mordants. 2nd. The method of dyeing by the employment of a shower bath instead of plunge baths, or by admitting the dyeing materials or mixtures in such quantity that the fabrics will imbibe them, or nearly imbibe them, in passing through the cistern keeping the mixtures in an equal or nearly equal degree of concentration. 3rd. The employment of strong acid baths with zinc bases, bichromate of potash and sulphate of copper or iron, for fixing the wood colouring matter on mixed cotton and worsted textile fabrics.

No. 11,758. Improvements on Washing Machines. (*Perfectionnements aux machines à laver.*)

Sylvester T. Andress, Caintown, Ont., 15th September, 1880; for 5 years.

Claim.—The combination with the suds box A having an internal revolving drum D, of a cover H hinged to the end of the box A to form, when open, a horizontal tray, and when closed, confine the steam and odor within the suds box.

No. 11,759. Improvements on Nut and Bolt Locks. (*Perfectionnements aux arrête noix et boulons.*)

Moses H. Grubb, Vincent, Pa., U. S., 15th September, 1880; for 5 years.

Claim.—1st. The socketed plate *a* provided with ear *a1* and staple *c*, and socket plate *b* provided with slots *b1 d*, said plates being hinged together by means of the ear *a1* and slot *b1* and locked by the ring E. 2nd. The plate *b* provided with raised edges *f* about the nut socket. 3rd. The plate *b* cut away between the nut sockets *a2 a2*. 4th. The combination, with the nut lock E, of the bolt head lock H provided with sockets *n* and lugs *m*. 5th. The combination, with the nut lock, of a head lock L provided with sockets *o o* having raised edges and connecting bar *p*.

No. 11,760. Improvements on Washing Machines. (*Perfectionnements aux machines à laver.*)

William Church, West Haven, Ct., U.S., 15th September, 1880; for 5 years.

Claim.—The plates H, frame I with slots *b* and the roller G confined between the plates and frames, in combination with the rollers F forming the bed of the washing machine, and having their journals *a* resting upon the top of the friction rollers G.