series of operating wires 63 connected with said bars, any one of which wires is adapted to be operated independently of the others to turn said casing upon its axis. 5th. The combination, with the *alarm mounted upon a pivotal support and provided with the projecting bar 61*, of the bar 65 adapted to engage with said bar 61, the spring 67 surrounding said bar 65 and adapted to retract the same, the stop lever 71 adapted to engage said bar 65 and the series of levers 73 bearing upon said lever 71, and each provided with the spring 75 and cord 77, all substantially as described. 6th. The combination, with the tilting alarm provided with the projecting bar 61, and the spring lever 65 adapted to engage therewith, of the stop-lever 71 engaging said lever 65 and holding it against the tension of its spring, the independent spring-levers 73 bearing upon said lever, the cords 77 connected with said levers 73, and the pivoted plates 81 provided with numbers and connected with said cords, all substantially as and for the purpose set forth. 7th. The combination, in a fire signal apparatus, of an alarm mechanism, a casing mounted upon a pivotal support and inclosing said alarm, a spring actuated bar adapted to engage with said casing and to turn it upon its pivotal support, a stop holding said bar normally out of engagement with said alarm, a series of releasing devices, any one of which is adapted to release said stop and permit it to tilt the alarm casing, and a series of cords connected with said releasing devices, whereby, when any one of said cords is burned off, one of the releasing devices will be operated and the alarm will be sounded. 8th. The combination, in a fire signal apparatus of an alarm, a casing mounted upon a pivotal support and inclosing said alarm, an operating bar connected with said casing and adapted to turn it upon its pivotal support, a series of cords connected with said operating bar, and a series of index plates connected with said cords, whereby, when any one of said cords is burned off, the alarm mechanism is operated, and the corresponding index device is also operated, substantially as described.

No. 30,038. Means for Cleaning and Polishing Metals. (*Moyens de nettoyer et polir les metaux.*)

John Dean and George H. Kingsley, Cleveland, Ohio, U. S., 24th October, 1888; 5 years.

Claim.—In the art of abrading and polishing, the combination of an abradent, as powdered emery, or the like, with small, soft metal bodies, as leaden balls, or their equivalent, the abradent and metal bodies being separable and distinct elements, whereby, when employed in a rumbler, said elements co-operate in polishing exposed surfaces, substantially as set forth.

No. 30,039. Sad Iron. (*Fer à repasser.*)

Joel Bennitt, Tiffin, Ohio, U. S., 25th October, 1888; 5 years.

Claim.—As an improved article of manufacture, a sad iron, consisting of a shell A, having hook-shaped lugs B, a reversible flat cover D, an open ended arched shield E, handle G and lever H, having handle I, substantially as described and for the purpose specified.

No. 30,040. Manufacture of Knitted Fabrics. (*Fabrication des tricots.*)

Joseph J. Adgate and Samuel P. Kittle, Grey's Inn Road, Eng., 25th October, 1888; 5 years.

Claim.—1st. The particular method, herein described, of introducing and interweaving an unknitted weft thread in a knitted fabric in course of manufacture, which method consists in leading the weft thread between the knitting needles, when the same are in their highest position and are separated into two rows, the weft thread being led in, in a gradually downwardly inclined direction, so that on the two rows of needles coming again into one line, the weft thread will be behind the needles of the front row, and in front of the needles of the back row, and will therefore be crossed between the needles by the warp thread which is introduced immediately afterwards into the hooks of the needles, so that on the casting off of the previously formed loops of warp thread, the weft thread will be entwined partially around the warp thread, substantially as specified. 2nd. The herein described method of knitting a fabric with a striped pattern running longitudinally of the piece which consists in introducing an extra or pattern warp thread between the needles, when the same are separated into front and back rows of needles, the thread being laid in the hooks of the back needles, only so as to be looped by the back needles and not by the front needles, as specified, whether the warp threads forming the ground are or are not also looped by the same needles.

No. 30,041. Steam and Compressed Air Engines. (*Machine à vapeur et à air comprimé.*)

Frederick W. Cannon, London, Eng., 25th October, 1888; 5 years.

Claim.—1st. In a steam or compressed air engine, the described double arrangement of cylinders, with centre chamber in which works the valve gear, and into which the exhaust takes place before escaping into the atmosphere or into a condenser, substantially as set for the purpose described. 2nd. In a steam or compressed air engine, the combination, with the described double cylinder arrangement and centre chamber, of the peculiar construction of valves *g*, the exhaust ports of which open into the said centre chamber, substantially as hereinbefore described and illustrated in the accompanying drawings. 3rd. In an engine of the kind herein described, the arrangements of mechanism for actuating the valve, as hereinbefore described and illustrated in the accompanying drawings. 4th. The modified arrangement of valve, hereinbefore described and illustrated in the accompanying drawings, in which the lateral motion of the valve is effected by a block moved up and down within the interior of the valve. 5th. A valve constructed as herein before described and illustrated in the drawings, that is to say, having a port passing right through it, so as to adapt it for converting a steam engine into a compound engine, substantially as hereinbefore described and illustrated in drawings. 6th. In a steam or compressed air engine, the method of exhausting into a centre chamber, as described, whereby the lubrication of the working parts is effected and the atmospheric pressure reduced, *substantially as and for the purposes* hereinbefore described. 7th. The combination of parts forming an improved steam or compressed air engine, arranged and operating as hereinbefore described and illustrated in the accompanying drawings. 8th. The improved compound engine, hereinbefore described and illustrated in the drawings.

No. 30,042. Means for Facilitating the Severance of Paper, Parchment, etc., and especially applicable to Envelopes, etc. (*Moyens de faciliter la séparation du papier, parchemin, &c., et spécialement applicable aux envelopes, etc.*)

Margaret B. Binns, Bebek, Turkey, 25th October, 1888; 5 years.

Claim.—1st. The method of facilitating the severance of paper, parchment, cardboard, *and other materials, by means of a thread or* threads which is or are interlaced or interwoven through a series of perforations along the line at which such severance is to be effected, substantially as described. 2nd. Envelopes, postal and other wrappers and similar articles, having a thread extending through a series of perforations along the line at which the opening is to be effected, substantially as described

No. 30,043. Voltaic Battery. (*Pile voltaique.*)

Theophilus Coad, Forest Gate, Eng., 25th October, 1888; 5 years.

Claim.—1st. In voltaic batteries, the combination of the contact point C suitably held, and wedges D, as and for the purposes set forth. 2nd. In voltaic batteries, the combination of the contact point C, suitably held, and clip M, as and for the purposes set forth. 3rd. In voltaic batteries, the combination of the bent over contact piece H and wedges D, as and for the purposes set forth. 4th. In voltaic batteries, the combination of the bent over contact piece H and clip M, as and for the purposes set forth. 5th. In voltaic batteries, a porous pot, having only a narrow vertical portion of its surface opposite the zinc left porous, as set forth.

No. 30,044. Friction Clutch. (*Embrayage à friction.*)

James Macdonald, Chicago, Ill., U.S., 26th October, 1888; 5 years.

Claim.—1st. The combination of the cylinder J having an interior friction surface ring G, hub E, pin F, arm H having the bent portion *h1*, and the loose cone D, in operative connection with the lever C, substantially as described. 2nd. The combination of the cylinder J, having an interior lining of compressed paper ring G, hub E, pin F, arm H having the bent portion *h1*, and the loose cone D in operative connection with the lever C, substantially as and for the purposes specified. 3rd. The combination of the cam or pin F, provided with the partially flattened surface *f2*, arm H, and set-screw *h*, whereby said set-screw may be tightened in proportion as power is applied to said arm with a hub, friction ring and cylinder, and a sliding cone connected with a hand lever, substantially as described. 4th. In a friction clutch having a friction cylinder and expansion ring adjusted upon a suitable hub thereon, the combination of the cam or pin F provided with the partially flattened or eccentric surface *f2*, arm H and set-screw *h*, and part *f3* for adjusting the expansion of said ring to the wear of the interior friction surface of the shell with a loose cone in operative connection with a hand-lever, substantially as described.

No. 30,045. Metallic Piston Rod Packing. (*Garniture métallique pour tige de piston.*)

Theodore Falk, Chicago, Ill., U.S., 26th October, 1888, 5 years.

Claim.—1st. A metallic packing-ring provided with a number of longitudinal grooves, which are cut through for a portion of the length of said ring, and then gradually growing more shallow until they run out, substantially as and for the purpose set forth. 2nd. A metallic packing-ring having a conical bevelled end, and provided with a number of grooves extending from end to end, and which are only cut clear through for a portion of the length of said ring, substantially as and for the purpose set forth. 3rd. The combination, with a metallic packing-ring having a conical bevelled end, and provided with a number of graduated grooves, as described, of a cap-ring fitting over the conical end of said ring, and a spiral spring interposed between said cap-ring and the bottom of the stuffing-box substantially as and for the purpose set forth. 4th. The combination, with the metallic packing-ring C provided with a number of diagonal grooves, as described, of the loosely arranged seat-ring *b1* bevelled on the inner edge next the piston rod, and having a spherical bearing surface for the contacting end of said ring, which has a corresponding surface, substantially as and for the purpose set forth. 5th. The combination, with the packing-ring C having a conical bevelled end and longitudinal grooves, as described, of the cap-ring *b* fitting over the conical end of said packing-ring, and provided exteriorly with the shoulder *a*, the coiled spring *a*, the seat-ring *b1*, and the packing-gland D, all constructed and arranged substantially as set forth. 6th. The combination, with the packing-gland D provided with the lubricating-chamber *d*, of the ring or washer *d*, the screw-cap *d*, and the oil-cup *d1*, substantially as set forth.

No. 30,046. Metal Wheel. (*Roue en métal.*)

Thomas S. Page, Toledo, Ohio, U.S., 26th October, 1888; 5 years.

Claim—1st. In a wheel, a hub provided with outer disks having flanges and inner disks of a diameter to fit within the flanges and be secured thereon by the overlapping flange of the outer disk, in combination with spokes secured between the disks and passed through openings formed in the flanges, as and for the purpose set forth. 2nd.