

ing rollers revolving with a space between them equal to the thickness of the sheet metal to be produced, and at a sufficient surface speed in respect to the space between the rollers, the size of the discharge opening and the velocity of the stream of molten metal, so that the molten metal cannot collect above and between the rollers, substantially as specified. 6th. The combination, with a pair of revolving rollers, of a pouring nozzle or vessel above and between them, and a heater for heating said vessel, substantially as specified. 7th. The combination, with a pair of revolving rollers, of a pouring nozzle or vessel above and between them, a heater for heating said vessel, and a crucible or vessel for holding molten metal, and a pipe or conductor leading therefrom to said pouring nozzle or vessel, substantially as specified. 8th. The combination, with a pair of revolving rollers, of a pouring nozzle or vessel above and between them, a heater for heating said vessel, a crucible or vessel for holding molten metal, a pipe or conductor leading therefrom to said pouring nozzle or vessel, and a heater for heating said pipe or conductor, substantially as specified. 9th. The combination, with a pair of revolving rollers, of a pouring nozzle or vessel above and between them, and a heater for heating said vessel, said heater consisting of gas burners, substantially as specified. 10th. The combination, of a pair of revolving wheels or rollers having a space between them equal to the thickness of the metal to be produced, a pouring nozzle or vessel, and a crucible connected with said pouring nozzle or vessel, substantially as specified. 11th. The combination, with a pouring nozzle having a long narrow discharge slot or opening, of a pair of hollow revolving rollers or wheels having a space between their peripheries at their meeting line into which the stream of molten metal issuing from said pouring nozzle is directed, said wheels revolving at an equal or greater surface speed than the velocity of said flowing stream of molten metal, the shafts of said wheels or rollers being hollow and communicating at one end with an inlet water pipe and at the other with an outlet water pipe, substantially as specified. 12th. The combination, with a pouring nozzle having a long narrow discharge slot or opening, of a pair of hollow revolving rollers or wheels having a space between their peripheries at their meeting line, into which the stream of molten metal issuing from said pouring nozzle is directed, said wheels revolving at an equal or greater surface speed than the velocity of said flowing stream of molten metal, the shafts of said wheels or rollers being hollow, and communicating at one end with an inlet water pipe, and at the other end with an outlet water pipe, the inlet water pipe communicating with the interior of the roller near its centre, and the outlet near its periphery, substantially as specified. 13th. The combination, with a pair of revolving rotating wheels or rollers, of a pouring nozzle or vessel above and between them, one or both of said wheels or rollers being mounted on adjustable bearings to regulate the thickness of the sheet of metal produced, substantially as specified. 14th. The combination, with a pair of revolving wheels or rollers B, B, pouring nozzle or vessel D having discharge openings *d*, and support F for said vessel mounted on one or more adjusting screws, substantially as specified. 15th. The combination, with a pair of revolving rollers, of an adjustable pouring nozzle above and between them, substantially as specified. 16th. The combination, with the revolving rollers B, B, of pouring nozzle D above and between them, having discharge openings *d* at its lower end, support F, and four adjusting screws *f*, *f*, *f*, *f*, substantially as specified. 17th. The combination, with revolving rollers B, B, of pouring nozzle or vessel D located above and between them, and made of a curved or wedging shape to permit the lower end of said nozzle to project down near the meeting line of said revolving rollers, substantially as specified. 18th. The combination, with revolving rollers B, B, of pouring nozzle or vessel D located above and between them, a gas or other heater for projecting flame against said pouring nozzle or vessel, and a hood, as D<sub>1</sub>, surrounding said vessel to confine the heat, substantially as specified. 19th. The combination, with revolving rollers B, B, of pouring nozzle or vessel D having discharge slot or opening *d* at its lower end, and a valve or gate *d* to regulate the discharge orifice, and an adjusting handle or lever for said valve, substantially as specified. 20th. The combination, with revolving rollers B, B, of pouring nozzle or vessel D, having discharge slot or opening *d* at its lower end, and a valve or gate *d* to regulate the discharge orifice, and an adjusting handle or lever for said valve, and a sliding block *e*, and adjusting screw *e*, substantially as specified. 21st. The combination, with a pair of revolving rollers B, B, of a pouring nozzle or vessel D above and between the same, and a discharge orifice N below said rollers, substantially as specified. 22d. The combination of a pair of revolving rollers having smooth unflanged peripheries, and having a space between them equal to the thickness of the sheet of metal to be produced, with a pouring nozzle or vessel located above and between said rollers, whereby any inequalities in the flow of the metal in respect to the velocity of the revolving wheels is compensated for by variations in the width of the strip of metal produced, and the sheet metal made of uniform thickness, substantially as specified. 23rd. The combination, with a pair of revolving wheels or rollers having smooth and unflanged peripheries, of a pouring nozzle above and between them provided with a valve or gate for regulating the size of the issuing stream, whereby sheet metal strips of different widths may be produced on the same machine, substantially as specified.

### No. 32,195. Knitting Machine.

(Machine à tricoter.)

William Esty, Charles A. Busiel, John T. Busiel and Frank E. Busiel, Laconia, N.H., U.S., 3rd September, 1889; 5 years.

**Claim.**—1st. The combination in a knitting machine, of two straight and parallel rows of reciprocating needles, a reciprocating yarn carrier having two yarn-guiding eyes, and constructed and arranged to be semi-rotated or have its ends reversed, and thereby transfer each yarn carried thereby from one row of needles to the opposite row of needles at each end of its traverse, the reversing mechanism having provision for acting upon said yarn-carrier to reverse it, adjustable stops for controlling the operation of the said reversing mechanism, pattern-cams to control the position of the said stops to automatically effect the reversal of the yarn-carrier at predetermined times, and mechanism, substantially as described, connecting said adjustable stops and cams. 2nd. The two parallel rows of needles, means

having provision for reciprocating said needles, a reciprocating yarn-carrier having two yarn-guiding eyes arranged upon opposite sides of its axis of revolution, and a rack and pinion for reversing said yarn-carrier, combine with a pair of movable stops one at each end of the machine to operate said rack, and pattern-cams to move the said stops into and out of the path of said rack, according as it may be desired to reverse said yarn-carrier, to cross the yarn from one set of needles to the other, or to deliver the same yarn to the same set of needles for two or more courses in succession. 3rd. The two parallel rows of needles, means having provision for reciprocating said needles, a reciprocating and reversible yarn-carrier having two yarn-guiding eyes arranged upon opposite sides of its axis of revolution, a pinion and two rack bars engaging therewith upon opposite sides for reversing the said yarn-carrier, combined with two movable stops for operating said racks, and pattern-cams for moving said stops from the path of said rack bar to the path of the other rack-bar, and vice-versa, substantially as and for the purposes described. 4th. The two parallel rows of needles, means having provision for reciprocating said needles, a reciprocating and reversible yarn-carrier having two yarn-guiding eyes arranged upon opposite sides of its axis of revolution, yarn-carrier reversing mechanism having provision for acting upon said yarn-carrier to reverse the same, and the locking-mechanism having provision for retaining the said yarn-carrier in position at the conclusion of each semi-rotation thereof, combined with a pair of movable stops arranged one at each end of the traverse of said yarn-carrier, and pattern-cams for moving the said stops into position to operate said reversing mechanism or to prevent the operation of said reversing mechanism according to the work to be done.

### No. 32,196. Black Leaf Check Book.

(Calepin à feuille noire.)

James L. Morrison, (in trust,) Toronto, Ont., (assignee of Thomas McDowell, Niagara Falls, N.Y., U.S., 3rd September, 1889; 5 years.

**Claim.**—1st. A carbon sheet D attached to the spring B, which is connected to the cover A, and located below the perforations *a* which separate the stub E from the main leaf, substantially as and for the purpose specified. 2nd. A book fitted into a pocket A formed on the end of the cover A<sub>1</sub>, in combination with the spring B attached to the cover A<sub>1</sub>, and extending across the book at a point below the perforations *a*, substantially as and for the purpose specified. 3rd. A book fitted into a pocket A formed on the end of the cover A<sub>1</sub>, in combination with the carbon sheet D attached to the spring B, which is attached to the cover A<sub>1</sub> and extends across the book at a point below the perforations *a*, substantially as and for the purpose specified.

### No. 32,197. Water Closet. (Latrines.)

David L. Dwinell and Miller Brothers and Mitchell, Montreal, Que., 3rd September, 1889; 5 years.

**Claim.**—1st. In the construction of water-flushes for the bowls and hoppers of water-closets, etc., the combination of a tank provided with a standard or constant normal level of water, with a syphon arranged with said tank, as described, said syphon being provided with an obstructor, and an exhaustor to exhaust the air in the syphon and prevent its return, the whole substantially as described. 2nd. The combination, in an apparatus for flushing the bowl and hoppers, etc., of closets with water, of a tank B supplied with a standard level of water, as described, syphon A provided with body 3, cap 4, cup 5, and ball 8, and with an exhaustor, the whole substantially as described. 3rd. The combination, with a syphon, of the body 3, cap 4, cup 6, and ball 8, the whole constructed, arranged and operating with an exhaustor, substantially as described.

### No. 32,198. Horse Collar. (Collier de cheval.)

George W. Chapman, (co-inventor with Abraham C. Jacobs), Hillsborough, Wis., and George W. Griswold, Chicago, U.S., 3rd September, 1889; 5 years.

**Claim.**—In combination with a horse collar, the plates B, and the pad C formed and secured substantially as set forth.

### No. 32,199. Construction of Stoppers or Covers for the Mouths or Openings of Bottles, Pots, Jars and other Hollow Vessels. (Fabrication des bouchons ou couvercles de bouteilles, pots, jarres et autres ustensiles.)

Henry L. Phillips, South Hornsey, Eng., 6th September, 1889; 5 years.

**Claim.**—1st. In stoppers or covers for bottles, jars, cans, or other hollow vessels, the method of forming a continuous screw-thread by means of parallel grooves or depressions made upon one or more flat or curved strips of metal or other material, bent into a cylinder and fitted and fixed into the flange of a corresponding c.p. with or without the introduction between the cylinder and the flange of a cylindrical strip of metal, or of cement or other backing, substantially as described and shown. 2nd. A stopper or cover having two or more pieces fitted and fixed into a cap and having parts of a continuous screw-thread or other equivalent locking device formed upon them, as shown. 3rd. The screwed cover consisting of two or more parts, each having parts of a continuous screw-thread formed in its flange by means of curved dies, and all the parts being afterwards united together, as described. 4th. The method of forming the cap or cover from a disc having projecting pieces, such pieces being then turned down, and some or all of them having parts of a screw-thread formed upon them, and the remainder being either plain, or milled, or fluted, as described. 5th. The combination, with the cap or cover, of the milled or fluted ring or band *f* for the purpose of strengthening the caps or covers, and affording a better hold in screwing or unscrewing them, as described.