

needed with said sleeve, the end arm on said rock shaft, and the pattern chain for starting, reversing, or stopping said shaft O, substantially as described. 36th. In a knitting machine, the combination, with the needle bed, the needles therein, and the reciprocating needle actuating cams, of the shaft O, the right and left hand screws thereon, the nuts on said screws, the fingers pivoted on said nuts and adapted to engage and actuate the needles, the longitudinally movable and rotatable studs on said shaft, adapted to actuate said fingers, substantially as described, means, such as the springs ϕ^2 , adapted to return said fingers to their normal position, clutch mechanism, such as the described gear devices, the interposed sliding sleeve, the rock shaft ϕ^0 , connected with said sleeve, the end arm on said rock shaft, and the pattern chain for starting, reversing, or stopping said shaft O, substantially as described. 37th. In a knitting machine, the combination, with the needle beds, the needles therein, the reciprocating needle actuating cams, and the connecting yoke of the longitudinal guide bar provided with the parallel ribs p^1 , the yarn carriers mounted on said bar and provided with the oppositely notched fingers, the rocking lever pivotally connected with said yoke and provided with the projecting studs p^2 , p^3 , the arm p^4 , pivoted on said bar and provided with the V-shaped end and with the cam slot p^5 , the pattern chain provided with the plain and studded links, and the lever engaging with said links and cam slot, substantially as described. 38th. The combination, in a knitting machine, with the needle bed, the latch needles therein, and the needle actuating cams, of the thin elastic or self-adjusting latch opening plate disposed in the path of the needles, and the frame e^1 , upon which said plate is supported throughout its length, substantially as described. 39th. In a knitting machine, the combination, with the cam frame, the slide plate thereon, the longitudinal slide bar, provisions whereby said plate and bar are operatively connected, the needle actuating cams and the needle controlling cam supported on said plate, of the sliding safety cam mounted upon the cam frame below said slide plate and provided with beveled up projecting ends, substantially as described. 40th. The combination, in a knitting machine, with the needle bed, the latch needles therein, and the needle actuating cams, of the latch opening plate disposed in the path of the needles and having its working edge lower than the under side of the plate, together with the frame e^1 , provided with the guide ways e^2 , upon which the needle hooks are supported, as and for the purpose specified, substantially as described. 41st. In a knitting machine, the combination, with the needle bed, the needles, and the needle actuating cams, of the shaft, as O, the right and left hand screws thereon, the nuts or followers on said screws, the fingers connected with said nuts or followers, and provisions whereby said fingers are operated to throw the needles into or out of action, substantially as described. 42nd. In a knitting machine, the combination, with the needle bed provided with open needle grooves, the needles having downward bends or extensions which project through said grooves, and the needle actuating cams, of the shaft, as O, the right and left hand screws thereon, the nuts or followers on said screws, the fingers connected with said nuts or followers, and provisions whereby said fingers are operated to throw the needles into or out of action, substantially as described. 43rd. In a knitting machine, the combination, with the needle bed, the needles, and the needle operating cams, of the main shaft, screw mechanism thereon, fingers operatively connected with said mechanism and actuated through the medium of the same to act upon the needles, together with appropriate pattern mechanism adapted to control or time the operation of the main shaft and its adjuncts, substantially as described. 44th. In a knitting machine, the combination, with the needle bed provided with open needle grooves, the needles having downward bends or extensions which project through said grooves, and the needle operating cams, of the main shaft, screw mechanism thereon, fingers operatively connected with said mechanism and actuated through the medium of the same to act upon the needles, together with appropriate pattern mechanism adapted to control or time the operation of the main shaft and its adjuncts, substantially as described.

No. 37,320. Flask for Molding.

(Châssis pour moulage.)

William G. Richards, Boston, Massachusetts, U.S.A., 4th September, 1891; 5 years.

Claim.—1st. In a molder's flask, the combination, with the lower part or frame for the nowel, having at one side thereof an open extension provided with projecting flanges, and stops, substantially as described, of the pouring head having corresponding flanges and stops and constructed to set on said open extension in engagement with said frame stops, and means clamping said head to said extension by said flanges, substantially as described. 2nd. In a molder's flask, the combination, with the nowel and the bottom board provided with a pouring head at one side thereof, said bottom board having an opening extending from the pouring head along under the runner of the bottom plate under said bottom board opening, and means, substantially as described, removably holding in place said bottom plate, substantially as described. 3rd. In a molder's flask, the combination, with the bottom board having the opening 62, and the depending ribs 63 and 64, at the side of said opening, of the bottom plate 65, and clamps removably fixed to the bottom board and engaging the said bottom plate, substantially as described. 4th. In a molder's flask, the combination, with the bottom board having an opening with depending ribs on either side thereof, of the bottom plate having the short side flanges 66, 67, and clamps removably fixed to the bottom board and engaging said flanges, and a stop limiting the longitudinal movement of said bottom plate under said clamps, substantially as described. 5th. In a molder's flask, the combination, with the bottom board having the flange 87, and the lugs 88, 89, said lugs being constructed to engage pouring head locking devices of the pouring head E, having flange 86, constructed to bear against flange 87, and to rest on said lugs, whereby the weight of said head is sustained by said lugs, and wedges engaging between the lugs and pouring head flange, whereby the pouring head is locked in place, substantially as described. 6th. In a molder's flask, the combination, with the bottom board having a vertical seat for the

pouring head, and having the horizontal oppositely disposed lugs on either side of said pouring head seat of the pouring head constructed to rest against said seat between said lugs, and locking devices, substantially as described, engaging said lugs and bearing against the pouring head, whereby said pouring head is held in place against its said seat, and whereby on removal of said locking means the pouring head is free to be removed, substantially as described. 7th. In a molder's flask, the combination, with the bottom board having the flange 87, and the lugs 88 and 89, said lugs being constructed to engage the pouring head, locking devices of the pouring head E, having the flange 86, constructed to bear against flange 87, and to rest on said lugs, whereby the weight of said head is sustained by said lugs, and wedges engaging between the lugs and pouring head flanges whereby the pouring head is locked in place, substantially bottom as described. 8th. In a molder's flask, the combination, with the board having the flange 87 and the lugs 88 and 89, provided with hooks 93, 94, of the pouring head E, having the flange 86, fitting between said lugs, and bearing thereon, and the wedges engaging between said hooks and the flange 86, to hold the pouring head against flange 87, whereby said head is removably fixed in place, substantially as described. 9th. In a molder's flask, the combination, with the bottom board constructed, substantially as described, to receive the pouring head of the pouring head, constructed, substantially as described, to rest against said bottom board, and connected wedges, one on either side of said pouring head at the lower end thereof, said wedges engaging the bottom board and pouring head to lock the same together, and being united by a bar, whereby said wedges may be driven in place and removed, substantially as described. 10th. In a molder's flask, the combination, with the bottom board having the flange 87, and having lugs 88, 89, each hook provided of the pouring head E, formed in two parts 81 and 82, and constructed to engage between said lugs and bear on said flange 87, means uniting the upper end of said pouring head parts and locking devices, substantially as described, engaging the hooks of said lugs for clamping said head in place, the lower ends of the pouring head parts being held together by engaging between said lugs, substantially as described. 11th. In a molder's flask, the combination, with the nowel and the cope frame and the core set on the nowel of anchor rod holders, substantially as described, fixed to the cope frame, of the anchor rods therein, anchor rods extending through said holders and perforations, and wedges cross-wise of the anchor rods in said holders, whereby said rods are fixed in place to resist the rising of the core during the filling of the mold, substantially as described. 12th. In a molder's flask, the combination, with the cope frame, outer ring of the inner ring, divided into segments and a pair of ribs joining each segment with the outer ring, said ribs joining the segment near the ends thereof, and ribs extending inward from the outer ring and located between the segment supporting ribs, said intermediate ribs not joining said segment, substantially as described.

No. 37,321. Process of and Mold for Making Castings. (*Procédé de et moule pour faire les ouvrages en fonte.*)

William G. Richards, Boston, Massachusetts, U.S.A., 4th September, 1891; 5 years.

Claim.—1st. The process herein described of making plate and flange steel castings, which consists in filling the mold, and through-flowing the plate and flange juncture during the contraction of the plate, substantially as described. 2nd. In a mold, the combination, with the nowel having the main runner of the vented cope, the nowel and cope having formed therein, the mold space consisting of the plate space and flange space, said main runner communicating with the mold space adjacent to one side of the plate and flange juncture, whereby said juncture may be through-flowed during the contraction of the plate of the casting, substantially as described. 3rd. In a mold, the combination, with the nowel having the main runner of the vented cope, the nowel and cope having formed therein, the mold space, consisting of the plate space and flange space, said main runner communicating with the plate space adjacent to the plate and flange juncture, whereby said juncture may be through-flowed from the plate space into the flange space during the contraction of the plate of the casting, substantially as described. 4th. In a mold, the combination, with the nowel having the main runner of the vented cope, the nowel and cope having formed therein, the mold space consisting of the plate space and a flange space, substantially as described, extending along one edge of the plate space, said main runner extending alongside of the plate and flange juncture and communicating with the plate space through a series of passages opening thereinto, substantially as described. 5th. In a mold, the combination, with the nowel having the main runner therein, of the vented cope, the nowel and cope having formed therein the wheel-mold space, consisting of the plate space and the peripheral flange space, said main runner communicating with the plate space at intervals throughout the circuit thereof at points adjacent to and within the plate and flange juncture, whereby said juncture may be outwardly through-flowed throughout the periphery of the plate during the contraction of the plate, substantially as described. 6th. In a mold, the combination, with the nowel having the main runner of the vented cope, the nowel and cope having formed therein, the wheel-mold space consisting of the plate space and the peripheral flange space, said runner communicating with the plate space at intervals throughout the periphery thereof at points adjacent to the plate and flange juncture, said nowel having a pouring-head runner entering the circuit of the main runner tangentially thereto, substantially as described.

No. 37,322. Process of and Mold for Casting Steel Wheels. (*Procédé de et moule pour le coulage des roues en acier.*)

William G. Richards, Boston, Massachusetts, U.S.A., 4th September, 1891; 5 years.

Claim.—1st. The process herein described for making plate and rim steel wheels, which consists in filling the mold from below the rim space, being filled through the plate space and overflowing the