axle pulleys adapted to automatically and alternately revolve in taking up the slack of the straps, the straps connecting with said pulleys at one end and levers connecting their opposite ends with the rocking shaft and seat in a manner to alternately pull down on said straps. 3rd. The combination of a vertically playing seat, a hand handle, axle pulleys adapted to automatically and alternately revolve in taking up the slack of the straps, the straps connecting with said pulleys at one end, and levers connecting their opposite ends with said handle and seat, in a manner to alternately pull down on said straps. 4th. The combination, with the hollow pulleys provided with springs secured to the thimble, of the revoluble axle and pawls. 5th. The combination, with the revoluble hand handle provided with the pulley, of the guide-wheel provided with the crank, the pulley at the corner of the frame and its crank, the rod pivotally connecting said cranks and the belt on the pulleys.

No. 16,732. Improvements on Sand Papering Machines. (*Perfectionnements aux machines à appliquer le papier-verre.*)

William A. Doane, Cincinnati, Ohio, U.S., 21st April, 1883; for 5 years.

Claim.—1st. A sand paper machine, the sand paper roll of which runs in a barrel, which has an open side and is unobstructed between the legs of the stand, so that the concave side of curved work may be sand-papered on the machine. 2nd. A sand-paper machine, the said paper roll of which runs in a barrel composed of two sections, hinged together and unobstructed between the legs of the stand, the top section of the barrel being provided with an opening. 3rd. The combination of the sand-paper roll, the barrel in which it runs having an open side and being unobstructed between the legs of the stand and the removable tables, whereby either straight work or the concave side of curved work may be sand-papered on the machine. 4th. The combination of the sand-paper roll, the barrel in which it runs having an open side, and the removable tables constructed with ribs to enter the opening in the barrel, near the edges thereof. 5th. The combination of the table constructed with rigid downwardly projecting arms, the barrel constructed with retaining lugs and angle seats, and the set screws for adjusting the table.

No. 16,733. Improvements on Band Saws. (*Perfectionnements aux scies à ruban.*)

William H. Doane and George W. Bugbee, Cincinnati, Ohio, U. S., 21st April, 1883; for 5 years.

Claim.—1st. The combination, with a wood working machine frame, of the single table supported thereon and the reversible duplex table carrying a feed mechanism on one of its faces. 2nd. The combination, with a wood working machine frame of the single table supported thereon, the reversible duplex table carrying a feed mechanism on one of its faces, and the shaft for supporting and adapted to reverse said duplex table. 3rd. The combination, with a wood working machine frame, of the single table supported thereon, and the duplex table which is both reversible and movable towards and away from the single table, and also carries a feed mechanism on one of its faces. 4th. The combination, with a wood working machine frame, of the single table supported thereon, the reversible duplex table carrying a feed mechanism on one of its faces, the shaft for supporting and reversing said duplex-table, and the screw for sliding the shaft. 5th. The combination of the reversible duplex-table, the feed rollers mounted on the face of one of the two plates of said table, and the feed shaft and train for driving said feed rollers arranged between the plates of the table. 6th. The combination of the reversible duplex-table and a power feed mechanism mounted thereon, the driven pinion O1 of which is located so that it is thrown out of gear and into position to be driven, according as one face or the other of said duplex-table is turned up. 7th. The combination of the reversible duplex-table, a power feed mechanism mounted thereon, a gearing or train for imparting motion to the feed shaft thereof, and a lever or hinged arm for supporting part of said train and pivoted at a point distant from the feed shaft, so that, by moving said lever or arm, the train may be disengaged from, or engaged with said feed shaft. 8th. The combination of the reversible duplex table carrying a feed mechanism on one of its faces, the shaft supporting it and the worm gearing for turning said shaft. 9th. The combination, with a wood working machine frame and the single table supported thereon, of the reversible duplex table carrying a feed mechanism on one of its faces, the endwise movable shaft I, the forked hanger thereon for supporting one end of the worm shaft, and the worm gear feathered to shaft I between the forks of said hanger. 10th. The combination, with a wood working machine frame and the single table supported thereon, of the reversible duplex table carrying a feed mechanism on one of its faces, the shaft I, the forked hanger thereon, for supporting one end of the worm shaft and confining the worm gear, the screw for moving shaft I endwise, and the fixed bracket supporting the screw and bearing against one side of the hanger. 11th. The combination, with a wood working machine frame and the single table supported thereon, of the reversible duplex table mounted and adjustable on an eccentric of the shaft, by which it is turned and carrying a feed mechanism on one of its faces.

No. 16,734. Improvements on Fences. (*Perfectionnements aux clôtures.*)

James Haldane, Strathroy, Ont., 21st April, 1883; for 5 years.

Claim.—The combination of the perpendicular posts A B with the base C D and braces E, F, when combined with the section of fence having three or more panels G H I, and upright braces R R adjusted to the posts A B by the movable pins P.

No. 16,735. Improvements in Fences. (*Perfectionnements aux clôtures.*)

Solomon Chambers, Norwich, Ont., 21st April, 1883; for 5 years.

Claim.—In a worm fence, the rail H or other rail used as a lever, to tighten wire I and keep the fence as set.

No. 16,736. Dental Plate and Plate Flask. (*Plaque et châssis de plaque dentaires.*)

David V. Beacock, Brockville, Ont., 21st April, 1883; for 5 years.

Claim.—1st. A dental plate of cast metal composed of an alloy of gold, silver and tin. 2nd. A moulding flask composed of the perforated parts A and B having coinciding semi-tubular channels D and E E, and a clamping frame F provided with a binding screw G and handle H.

No. 16,737. Improvements in Sash Locks. (*Perfectionnements aux fermetures des châssis.*)

Gay's Sash Lock Company, (assignee of William A. Gay,) Buffalo, N.Y., U. S., 21st April, 1883; for 5 years.

Claim.—1st. The combination, with a sash A having a screw-stud or pin secured thereto, of a movable locking-plate C provided with inclined bearing surfaces *d d*1, an opening I arranged between said bearing surfaces and forming a rest for the plate when not in use, and a straight face E adapted to bear against a stationary frame B. 2nd. The combination, with a movable locking plate C provided with inclined bearing surfaces *d d*1, an opening I arranged between said bearing surfaces and a straight face E adapted to bear against a stationary frame B, of a pin-stud or screw F secured to a sash A, and a roller *g* arranged on the screw F to run in contact with said inclined bearing surfaces.

No. 16,738. Reverberatory Smelting Furnace. (*Fourneau de fusion à reverbère.*)

Ira C. Woodward, Charles H. Crofut and Leroy A. Andrews, (assignees of Riley P. Wilson,) Cleveland, Ohio, U.S., 21st April, 1883; for 5 years.

Claim.—1st. The combination of two or more reverberatory furnaces with the arrangement, whereby the last named furnace is adapted to receive fluid metal from the other furnaces, a common reverberatory furnace having a depressed hearth as a receiving furnace. 2nd. The combination of two or more reverberatory furnaces with inclined hearths of the feeding furnaces, with an additional reverberatory furnace having a depressed hearth, the arrangement being substantially set forth, whereby the last named furnace is adapted to receive fluid metal immediately from each of the other furnaces.

No. 16,739. Process for Making Pails from Pulp. (*Procédé de fabrication des seaux en pâte à papier.*)

Ezra B. Eddy, Hull, Que., (assignee of Eber Hubbard, Medina, N. Y., U. S.,) 23rd April, 1883; (Extension of Patent No. 8,674.)

No. 16,740. Improvements in Sewing Machines. (*Perfectionnements aux machines à coudre.*)

Charles E. Tibbles, Burlington, Iowa, U. S., 23rd April, 1883; for 5 years.

Claim.—1st. The combination, with the feed-bar and driving shaft, of the feed-cams consisting of the cam G keyed to the shaft and provided with a semi-circular groove or depression H, and the cam F provided with the stud I entering in the groove H, whereby a lost motion between the cams of a half revolution is permitted. 2nd. The cams F G having an engaging groove and stud, the cam being provided with recesse, in combination with a movable locking pin *a* and a set screw *z*, for operating the same through the interior of the shaft. 3rd. In a sewing machine having a variable direction of feed, the feed-bar W and the yoke T, in combination with the adjusting bar W and the abutment X and Y. 4th. The main shaft B provided with the eccentries K1 K1, in combination with the cross-head reciprocating in a horizontal plane connected to, and in combination with the shuttle lever C. 5th. The actuating cross-head consisting of the vertical pieces L1 L11, in combination with the horizontal screws *m*1 and eccentrics K1 K1. 6th. The vertical piece L11 having ears to which is keyed link N1, in combination with link N1 having a bifurcated end and projecting through an opening in piece L1 laterally larger than the link N1, whereby said link has a lateral play entirely independent of the cross-head. 7th. The cross-head L1 L11 M1 and the link N1 having a bifurcated end, and screw P1 projecting through N1, in combination with the shuttle lever having a split end. 8th. The bed plate A provided with recesses to contain oil, and ducts 31 32 to conduct the oil to the surfaces to be lubricated. 9th. The bed-plate provided with chambers, in combination with the inclosed fibrous or other non-resonant material, for the purpose of deadening the sound. 10th. The compressible tapering bushing 4 provided with a spiral slit passing once, or more than once around said bushing. 11th. In a sewing machine shuttle, the pins 47 47 in line, in combination with the pin 48 out of lines with pins 47. 12th. In a sewing machine shuttle, the latch 49 provided with a slight upward bend at its hinge, in combination with the flat projection 52 to prevent the latch binding the thread. 13th. An open faced shuttle having the upper edge of the face made convex. 14th. In an open faced shuttle having its heel and point dressed to coincide with, and bear against the curvature of the race, and the intermediate face cut so as not to come in contact with the race, in combination with a curved race. 15th. The shuttle-lever provided with two projecting arms R1 R1 having their interior faces curved as shown, in combination with the crank having cylindrical wrist T and two independent gibs S1 S1 having convex surfaces to conform to the curvature of the interior of arms R1 R1, and concave surfaces to conform to the curvature of the cylindrical wrist. 16th. The compensating pivot consisting of the double cones U1 U1 provided with screws X1, bolt V1 provided with groove E, and jam nuts W1. 17th. In combination with feed-bar adapted to be moved positively both forward and backward, a cam for horizontally moving the said feed-bar by a positive motion in either direction in time, said cam having one working face *l q* with all its points cut nearer in direct lines to the vertical central line *f g* than the points of the other working face *w o*. 18th. The combination of