

shaft, the wooden pin and the grinding disk having the exposed hub to receive the pin, said parts being constructed to permit the instantaneous removal and replacement of the pin without removing or disconnecting the other parts. 4th. The combination of the shaft, the disk seated upon and firmly against the end of the shaft, and the wooden pin inserted and operated to turn the disk without receiving the pressure thereof, whereby the use of a weak pin is permitted without danger of its being broken by the grinding pressure. 5th. The grinding disk, provided with the teeth *d* extending lengthwise in substantially the same lines or directions, but inlined in opposite directions in cross section. 6th. A disk grinder having internal abrupt cutting teeth and external backwardly inclined crushing teeth. 7th. The combination with the pendulous shaker *h*, the eccentric *i* adapted to vibrate the shaker. 8th. In combination with the inclined conductor *d*, the suspending cord *f* and winding spindle *j*. 9th. In combination with the two disks *C* and the main frame, the adjustable guides *m*. 10th. In combination with the adjustable disk *F*, the swinging bar *G*, bolt *O* and nut *p*. 11th. In combination with the swinging bar *G*, bolt *O* and nut *p*, the dog *s* adapted to engage with and prevent the unscrewing of the nut. 12th. The method of constructing a grinding surface, consisting in casting a body with grooves or openings therein, and subsequently running or pouring molten metal into said grooves or cavities, whereby the body is provided with chilled grinding surfaces or projections. 13th. As a new article of manufacture, a grinder consisting of a cast metal body, and chilled sections or strips of metal cast therein.

No. 11,692. Improvements in Turbines. (*Perfectionnements aux turbines.*)

John H. Staples, Worcester, Mass., U. S., 30th August, 1880; for 5 years.

Claim.—1st. The turbine *A* as composed of the shaft sustaining head, the cylindro-conical bucket supporter, and the series of buckets arranged as set forth. 2nd. The chute *E*, annulus *D* grooved and provided with the annular packing *n*, in combination with the gate and the wheel. 3rd. The combination of the tubular standards *K* with the chute support ring *D* and the annular gates and its sustaining screw rods and nuts, and such gate being disposed with respect to the turbine and its chute. 4th. The combination of the tubular guard *H* applied to the stuffing box cap, with the said stuffing box, and the wheel and its shaft, and the chute and its dome, such wheel and chute having an annular gate.

No. 11,693. Improvements on Photographic Apparatus. (*Perfectionnements aux appareils photographiques.*)

John R. Mote, Antwerp, Ohio, U. S., 30th August, 1880; for 5 years.

Claim.—1st. In a photographic apparatus, the box having an inclined top closed by a sliding cover containing an eye piece or tube opening in the sides of such box, for the admission of coloured light, inclined shelves or partitions in the bottom of box to hold the bath-dish, and sleeves attached to the box on either side. 2nd. The eye tube *A* in the inclined top of the box, in combination with the sleeves entering the said box at the sides thereof. 3rd. The box having inclined top, a sliding cover for giving access to the interior and an eye tube placed in such sliding cover.

No. 11,694. Improvements in Milk Coolers. (*Perfectionnements aux garde-lait.*)

Norris D. Martin and John Bean, Montreal, Que., 30th August, 1880; for 5 years.

Claim.—1st. The tank frame *A* having a close wooden bottom *C* and water-tight metallic lining *A*, in combination with an inserted milk pan *J*. 2nd. The provision to the tank of an adjustable water gauge consisting of a tube *D* having outlet orifice *F* sliding telescopically in the outlet tube *E* of the tank. 3rd. The removable water distributing pipe provided with a divided outlet at one end and a chamber *H* at the other end, for receiving the feed water and distributing it by a return flow. 4th. The removable milk pan constructed with a semi-oval or curved bottom *C*, in combination with a water tank *B*.

No. 11,695. Improvements in Window Fastenings. (*Perfectionnements aux arrête-croisées.*)

John Grant, Gananoque, Ont., 30th August, 1880; for 5 years.

Claim.—1st. In combination with a window fastener having a guide rod and thumb screw, the collars *C* having projecting pins *P*, the graduating stop collar *I*, the check spring *M*, or their equivalents. 2nd. The socket post *S* with the adjustable spindle *H* having keeper *K* attached, or their equivalents, in combination with the guide rod, thumb screw, collars and pins, graduating collar and check spring.

No. 11,696. Improvements on Elevators. (*Perfectionnements aux éleveurs.*)

Robert Dunbar, Buffalo, N. Y., U. S., 30th August, 1880; for 5 years.

Claim.—1st. An elevator *A* provided with an engine *B* connected thereto, in combination with the boiler *D*, and a suitable arrangement of steam pipes and valves. 2nd. A series of elevators, each provided with an engine geared thereto, in combination with a steam boiler *D* having a steam pipe *D*, and branches and valves for connecting with and operating the several engines and elevators, either separately or together.

No. 11,697. Improvements on Millstone Dress. (*Perfectionnements au rhabillage des meules.*)

William C. Hale, Austin's Springs, Tenn., U. S., 30th August, 1880; for 5 years.

Claim.—The radial and tangential furrows *c* and *d* made widest at their ends and narrowest at their centres, and running into each other at the eye of the stone, whereby the grain freely enters into the furrows at their inner ends, is held back by the contraction at their centres until sufficiently reduced, and then given a speedy discharge.

No. 11,698. Cutter Heads. (*Porte-lames*)

George J. Shmer, Milton, Pa., U. S., 30th August, 1880; (Extension of Patent No. 5,134.)

No. 11,699. Mould for Casting Turbines. (*Moule pour couler les turbines.*)

James C. Wilson, North Marysburgh, Ont., (Assignee of George H. Jones, Rose, N. Y., U. S., 30th August, 1880; (Extension of Patent No. 5,148.)

No. 11,700. Improvements on Water Turbines. (*Perfectionnements aux turbines hydrauliques.*)

James C. Wilson, North Marysburgh, Ont., (Assignee of George J. Jones) Rose, N. Y., U. S., 30th August, 1880; (Extension of Patent No. 5,212.)

No. 11,701. Horse Nail Finishing Machine. (*Machine pour finir le clou à cheval.*)

Charles S. Watson, (Assignee of Charles W. Woodford) Montreal, Que., 30th August, 1880; (Extension of Patent No. 5,813.)

No. 11,702. Horse Nail Finishing Machine. (*Machine pour finir le clou à cheval.*)

Charles S. Watson, (Assignee of Charles W. Woodford) Montreal, Que., 31st August, 1880; (Extension of Patent No. 5,813.)

No. 11,703. Improvements on Machine Belting. (*Perfectionnements aux courroies des machines.*)

George S. Long, Hartford, Ct., U. S., 31st August, 1880; for 5 years.

Claim.—1st. As an improved belt, the combination of wire warp and a soft fibrous web so that the wires are bedded deeply in the fabric, and the fibre alone presented at the surface. 2nd. The wires *C* enclosed between two piles of the goods and adapted to receive and transmit directly the tensile strain. 3rd. A woven fabric having warps of wire combined with a compound web, each yarn of the latter composed of a number of soft spun yarns combined and arranged relatively to each other and to the wires. 4th. A woven belting having wires *A*, in the warp, and caps *D* soldered thereon to form the ends.

No. 11,704. Improvements on Bake Pans. (*Perfectionnements aux tourtières.*)

Charles Jackson, California, Ohio, U. S., 3rd Sept., 1880; for 5 years.

Claim.—The combination, with the pans *A* *B*, the fasteners *F* provided with handles *f* and made in the form of tubes slotted longitudinally, to receive and fit upon the wires at *b* of the said pans *A* *B*.

No. 11,705. Improvements on Steam Boilers. (*Perfectionnements aux chaudières à vapeur.*)

George H. Babcock, Plainfield, N. J., Stephen Wilcox and Nathaniel W. Pratt, Brooklyn, N. Y., U. S., 3rd Sept., 1880; for 5 years.

Claim.—1st. A steam boiler having a barrel *A* with connected heating tubes *M* and their connections *D* *G*, the side tubes *T* and connecting chambers *P* *P*, in combination with each other and with the connecting thimbles, *O*, adapted to allow the water to descend into the rearmost tubes *T* and to ascend in those against the furnace. 2nd. The horizontal flues *A* and connecting flues *a*, in combination with the barrel *A*, main heating tubes *M*, connections *D* *G*, partial partitions *E* *F*, side tubes *T* and inclosing case *N*. 3rd. In combination with a boiler having a barrel *A*, main heating tubes *M*, and connections *D* *G* having orifices for cleaning the exterior of the tubes, the casing *N* and side doors *n* adapted to facilitate the cleaning of the mid-lengths of tubes. 4th. In combination with the board *A* extending from front to rear of the boiler tubes *M*, front partition *E* and one or more partial partitions *F* in rear thereof, the horizontal bridge *E'* arranged to compel the hot gases to strike the barrel at its front end.

No. 11,706. Improvements on Mowing Machines. (*Perfectionnements aux faucheuses.*)

George Sweet, Danville, N. Y., U. S., and John Watson, Ayr, Ont., 3rd September, 1880; for 5 years.

Claim. 1st. The combination, with the rocking coupling arm and the cutting apparatus hinged thereto, of a retaining or thrust bar, and an adjusting lever and link, said thrust bar and link being connected to the frame of machine at substantially a common point, in rear of the axle and diverging therefrom and extending forwardly to separate points of connection on the coupling arm. 2nd. The combination, with a rocking coupling arm having the cutting apparatus hinged thereto and provided with a supporting wheel, of a rearwardly extending thrust bar and an adjusting lever and link. 3rd. The combination of the fixed tongue bolted to the frame, the bracket fastened directly to the tongue, the thrust bar coupled thereto and to the cutting apparatus, all arranged and operating as described and for the purpose of transferring the strain from the frame of the machine to the tongue, when the cutting apparatus strikes an obstruction. 4th. The rocking coupling arm provided with a supporting wheel *Q*, and a rearwardly extending bracket *E*. 5th. The combination, with the rocking coupling arm having the cutting apparatus hinged thereto, and provided with a supporting wheel and retaining and tilting devices, of a lever for lifting the cutting apparatus vertically.

No. 11,707. Improvements on Snow Ploughs. (*Perfectionnements aux charrues à neige.*)

Frank W. Hawley, (Assignee of De Witt Hawley) Rochester, N. Y., U. S., 3rd September, 1880; for 5 years.

Claim. 1st. The combination of the inclined plane *A* and the vertical screw conveyor or conveyers *B*, provided with suitable casings open at top and bottom, and having their lower ends located in the rear of the inclined plane. 2nd. The combination of the inclined plane *A*, the vertical conveyor or conveyers *B* and the inclined roof *C*. 3rd. The combination of the inclined plane *A*, wings *D* *D*, vertical conveyor or conveyers *B* and the