

fiers R and their connections, and suitable take up mechanism; 19th. The fixed guide X in combination with the flattening rollers  $y_1 y_2$ , carriers R with their bobbins Q traversed thereon, and with a suitable take up mechanism.

**No. 11,312. Method and Apparatus for Grinding and Purifying Grain.** (*Procédé et appareil pour mouliner et épurer les grains.*)

George Milbank, Chillicothe, Mo., U. S., 1st June, 1880; for 5 years.

*Claim.*—1st. The method of reducing grain or other substances in subjecting the material under treatment to the action of reducing discs and an air current simultaneously, the said air current passing between the discs and conveying the reduced material in opposition to the centrifugal action of the same; 2nd. In subjecting the material under treatment to the action of reducing discs and an air current simultaneously, the said current passing between the discs and conveying the reduced material in opposition to the action of the dress of the same; 3rd. In subjecting the material under treatment to the action of reducing surfaces set in a plane other than the horizontal and an air current simultaneously, the said air current passing between the reducing surfaces and conveying the reduced material in opposition to the action of gravitation; 4th. In subjecting the material under treatment to the action of reducing discs and an air current simultaneously, the dress of the reducing discs and the air current combined conveying the reduced material in opposition to the centrifugal action; 5th. In subjecting the material under treatment to the action of reducing discs having reducing surfaces inclined from the horizontal, and an air current simultaneously, the dress of the inclined discs and the air current combined conveying the reduced material in opposition to the action of gravitation; 6th. In combination with reducing discs A A', the casing D and fan mechanism connected therewith, the construction being such that an air current is delivered by the fan mechanism to the periphery of the discs and through between the same to the eye; 7th. In combination with the reducing discs A A' an interior chamber and fan mechanism connected with the chamber, the construction being such that an air current may be drawn through between the discs from the periphery to the eye; 8th. The combination with the reducing discs having the periphery of the grinding surfaces higher than the eye of mechanism for producing an air current, the construction being such that the action of the current is opposed to the action of gravitation; 9th. The combination with the reducing discs having the periphery of the grinding surfaces lower than the eye of mechanism for producing an air current, the construction being such that the air current is opposed to the action of gravitation; 10th. The receiving chamber B located in the reducing discs and in open unbroken communication with the eye of the same, in combination with mechanism for reducing the grain or other substance and mechanism for producing an air current, and thereby delivering the receiving chamber in opposition to the centrifugal action of the reducing discs; 11th. In combination with the reducing discs delivering material at the eye and mechanism for producing an upward air current, the deflector C for breaking up or dividing the current; 12th. Passing the material between the reducing discs with an air current opposed to the centrifugal action, and in carrying upward from the eye the lighter particles by an ascending air current, by means of which action the heavy and light particles are separated before being baled; 13th. In combination with the reducing discs A A', the feed hopper F, the spout E or G with casing D and fan mechanism, whereby the feed is passed over the upper discs and simultaneously an air current passed between the grinding faces to move the reduced materials in opposition to centrifugal action; 14th. In combination with the reducing discs A A' provided with an internal receiving chamber B and fan mechanism, the drum or discs  $a$  fitted in the chamber B; 15th. The disc A' provided with the opening or openings  $k$  and fitted with the annular flange  $k'$ , the construction being such that the feed passes by the openings  $k$  to the grinding faces, and the air current produced by suitable means passes from the periphery to the eye, to remove the reduced particles toward the centre; 16th. The revolving grinding wheel  $m$  shaped as the frustum of a cone, and the casing  $m'$  combined together and fitted with the feed spout and pipe for supplying an air current between the grinding surfaces; 17th. The grinding cylinder  $p$  fitted for revolution and the fixed cylindrical casing  $p'$  open at both ends and provided with a feed spout combined together when said apparatus is placed horizontally or inclined, and air current caused to pass in either direction for removing the reduced particles; 18th. The discs  $o o'$  fitted in relation to each other and vibrated when the feed and ascending air currents are supplied, for the purpose of removing the finer particles by air currents in opposition to gravitation; 19th. The combination with the reducing discs having horizontal grinding faces of mechanism for producing an air current for the purpose of moving the reduced material towards the centre, whereby the action of the air current is opposed to the centrifugal action; 20th. The method of removing the reduced particles from between grinding cylinders or cones constructed for operation as shown, that is by an air current passed between the grinding faces in either direction; 21st. In combination with the vertical reducing cylinder A and L, the flange  $k$  and openings H, for directing the feed between the grinding faces and the fan mechanism connected therewith, the construction being such that the air currents pass upward to remove the reduced particles; 22d. The reducing disc formed with peripheral furrows  $s$  and unfurrowed portion around the eye.

**No. 11,313. Improvements on Grain Binders.**

(*Perfectionnements aux lièures à grain.*)

Christopher W. Levalley, St. Paul, Min., U. S., 1st June, 1880; for 15 years.

*Claim.*—1st. The combination with the binder frame formed with the brackets C; C' and the inner bar C, projecting beyond one of the brackets, of the main frame and hooks B B' and the rack  $c$ , so that the front bracket shall be outside of the hook B, and the rear bracket shall be inside of the hook B; 2nd. The combination of an oscillating frame, a needle pivoted to said frame, and mechanism which throws the needle pivot through a greater arc while the needle is descending, than while it is rising; 3rd. A crank arm G<sub>3</sub> and the needle frame, in combination with the bell crank lever H, whereby the crank pin engages with the lever near the lever's pivot while the needle is descending than when it is rising; 4th. The combination of the crank arm G<sub>3</sub>, bell crank lever H, link  $h$  and the needle frame; 5th. The combination with the segment I, the arm and rack I' and crank arm G<sub>1</sub>, of the frame I<sub>2</sub> and arm  $i$ ; 6th. As a means for supplying bands to the needle of a grain binder, a cord formed into convolutions, from which, when in operation, the inner convolutions are first delivered to the needles,

in combination with a shaft or spindle which is free at the end from which the cord passes as it is unwinding; 7th. A shaft arranged within the binding cord, said shaft being free to vibrate at the end from which the cord is delivered; 8th. A shaft or spindle which supports the cord and is secured at one end by a flexible joint; 9th. The combination with the spindle Mx and inclosing cylinder M, of the cap or cover provided with a central opening through which the cord is delivered; 10th. The combination with the support M<sub>1</sub>, provided with the stops  $m_2 m_3$ , of a pivoted arm M<sub>2</sub> and spring  $m_1$ ; 11th. The combination of the support M<sub>1</sub>, provided with the stops  $m_2 m_3$ , the vibrating arm M<sub>2</sub>, springs  $m_1$  and the tension plate  $m_3$ ; 12th. The combination of an eccentrically revolving loop former, a holder which grasps the cut end of the cord, mechanism which moves the loop former during part of its rotation toward the cord holder and mechanism which at the same time moves the cord holder toward the loop; 13th. The combination of the eccentrically revolving loop former, a cord holder which grasps the cut end of the cord, mechanism which moves the loop holder during part of its revolution away from the cord holder and mechanism which at the same time moves the cord holder toward the loop; 14th. The combination of an eccentrically revolving loop former, a cord holder which grasps the cut end of the cord, mechanism which moves the cord holder toward the loop, and mechanism which severs the cord after the loop has been made; 15th. The combination with an eccentrically revolving loop former, of a hook arranged within the loop and rotated thereby, the loop also being rotated independently of the hook; 16th. In combination with the loop former, the hook  $pt$ , having its outer surface curved and adapted to pass the two strands of the cord to the hook  $r$ ; 17th. The combination with the hook  $pt$ , of the longitudinally reciprocating rod  $qt$ , provided with the guide hook  $q^5$  and situated substantially parallel to the axis of said hook  $pt$ ; 18th. The combination with the hook  $pt$ , of the reciprocating tube Q, and the guide arm  $q^3$ , reciprocating simultaneously with the tube; 19th. The combination of the tube Q, hook  $pt$  and hook rod R revolving with the tube, the tube also revolving independently of the hook; 20th. The combination with the loop forming tube Q, of a reciprocating and revolving hook  $r$  and a stop which holds the point of the hook toward the point of the needle, to receive the clamped end of the twist; 21st. The combination with the loop forming tube Q, of a reciprocating and revolving hook  $r$  and a stop which locks the hook in position with its point upward; 22nd. The combination with the hook rod R, of the bent lever R<sub>1</sub>, pinion P<sub>1</sub>, hollow shaft Q, spring R<sub>2</sub>, collar  $r_3$  and dog  $r_2$ , adapted to engage with the stops; 23rd. In combination with the binding cord, mechanism adapted to throw the knife out of action; 24th. In combination with the binding cord, the holder which grasps the cut end of the cord, and the devices which move a part of the cord holder to release the cord, mechanism which throws said cord releasing devices out of operation; 25th. The combination of a cord holder which grips the cut end of the cord, mechanism which alternately opens and closes the cord holder, and mechanism actuated by the cord to throw out of action the devices which open the cord holder; 26th. A cord cutting and clamping mechanism, one part of which carries an adjustable cutting knife, the other part being provided with a fixed stop to determine the position to which the knife shall be adjusted; 27th. The combination of the cam-wheel F, rock shaft S, crank S<sub>5</sub>, pitman S<sub>6</sub>, bar W, bent lever S<sub>7</sub>, and returning spring S<sub>7</sub>; 28th. The combination of a reciprocating tubular looper, a reciprocating knot-hook and a cord holder, one member of which is attached to the reciprocating shaft or bar, all of which parts reciprocate on substantially parallel planes and are thereby adapted to be operated from the face of a single wheel, which revolves in a plane at right angles to the planes in which they reciprocate; 29th. The combination with an eccentrically revolving hook, of a reciprocating loop former which closes the open end of the hook, thereby forming a tight eye in which the cord is retained while the loop is being formed; 30th. The combination with the main frame and the hinged shields Z<sub>1</sub> Z<sub>2</sub>, of the horizontally projecting slotted bracket Z<sub>3</sub> Z<sub>4</sub>, and the thumb screw; 31st. In combination with the shield Z<sub>1</sub>, the supplementary shield Z<sub>4</sub> hinged thereto; 32nd. In combination with a cord holder which grasps the cut end of the cord, and devices which release the cord from the holder, mechanism which automatically throws the cord releasing devices out of action and mechanism which automatically returns them into action; 33rd. In combination with a knife or cord cutter and devices which cause said cutter to sever the cord, mechanism which automatically throws said cutter actuating devices out of action, and mechanism which automatically returns them into working relations with the cutter.

**No. 11,314. Improvements in Car Brakes.**

(*Perfectionnements aux freins des chars.*)

George Smith, Stratford, Ont., 1st June, 1880; (Extension of Patent No. 10,852.)

**No. 11,315. Improvements in Car Brakes.**

(*Perfectionnements aux freins des chars.*)

George Smith, Stratford, Ont., 2nd June, 1880; (Extension of Patent No. 10,852.)

**No. 11,316. Improvements on Heating Stoves.**

(*Perfectionnements aux poêles de chauffage.*)

William Buck and Judson W. Buck, Brantford, Ont., 2nd June, 1880; (Extension of Patent No. 4,810.)

**No. 11,317. Street Car Fare Box.** (*Tronc de char de chemin de fer urbain.*)

Leonard Maltus, Hamilton, Ont., 3rd June, 1880; (Extension of Patent No. 4,814.)

**No. 11,318. Combined Mattress and Bed Bottom.** (*Matelas et fond de lit combinés.*)

Isaac Mills, Hamilton, Ont., 5th June, 1880; for 5 years.

*Claim.*—The rollers B F, in connection with the ratchet A, dog E, cross slat D and bearings C G, forming the device or apparatus secured to the bed rails H, for the purpose of stretching and holding the canvas I, to form a bed bottom, and inside of which a mattress is placed.