scribed. 2nd. In a mole trap, the combination, of the frame A having the heel L, and ground post M, the plunger rod B, the cross-head E, the teeth F, the lever L, and the trigger K, all combined to operate substantially as described.

No. 30,338. Knife for Planing Machines.

(*Fer de machines à raboter.*)

Alexander C. Dumontier, Detroit, Mich., U.S., 5th December, 1888, 5 years.

Claim.—1st. A planing machine knife having its cutting edge B, formed diagonally across the end of the knife with respect to the parallel side surfaces of the knife-bar A, substantially as set forth. 2nd. A planing machine knife having its cutting edge B, formed diagonally across the end of the knife with respect to the parallel side surfaces of the knife-bar A, said knife-bar being longer on one side than the other, substantially as set forth. 3rd. The combination, with the cylinder, of a planing machine placed at right angles across the bed of the machine, of a knife having its cutting edge formed diagonally across the end of the knife-bar secured to the cylinder with its cutting edge all in the same rotary plane, substantially as set forth.

No. 30,339. Three Roller Mill for Grinding Grain. (*Moulin à blé à triple rouleaux.*)

Joseph L. Willford, Minneapolis, Minn., U. S., 6th December, 1888, 5 years

Claim.—1st. The combination in a three roller mill, of a centre roll, stationary boxes supporting said roll, upper and lower rolls, spring controlled levers supporting said upper and lower rolls, belt pulleys on all of said rolls, arranged on the same plane, a spring controlled tightener pulley in the same plane with the said road pulleys, and an open belt passing around said tightener pulley and all of said roll pulleys, substantially as described. 2nd. The combination, in a three roller mill, of a centre roll, upper and lower rolls, pivoted spring controlled levers supporting said upper and lower rolls, means for simultaneously moving said rolls towards or from the centre roll, belt pulleys on all of said rolls in the same plane, a spring-controlled tightener pulley in the same plane with said belt pulleys, and an open belt passing around said tightener pulley and around all of said belt pulleys, substantially as described. 3rd. The combination, with the centre roll, of the pivoted levers carrying the upper and lower rolls, a single spring tightener controlling each pair of levers, the shaft carrying the double eccentric arranged between the ends of said levers, bearing blocks on said levers bearing directly on said eccentrics, and means for rotating said shaft. 4th. The cast metal casing 2, formed in one piece, and having openings in its opposite walls, through which the rolls may be inserted or removed, substantially as described. 5th. In a three-roller mill, the cast metal casing having in its opposite walls the openings 20, through which the rolls may be inserted or removed, and the offsets 22, 24, in the upper and lower parts of said openings, adapted to receive the journals of the upper and lower rolls, as set forth. 6th The combination, in a three roller mill, with the casing having openings in its opposite walls, through which the polls may be inserted or removed, of the upper and lower rolls, the centre roll and the plates covering the openings in the casing, and having journal boxes receiving the journals of the centre roll, substantially as described. 7th. The cast metal casing 2, having openings through its opposite walls, through which the rolls may be inserted or removed, and offsets from said openings adapted to receive the roll journals, substantially as described. 8th. The combination in a roller mill, with the belt pulleys and belt, of the tightener lever, the idler pulley, the independent journal boxes supporting said pulley, and means for adjusting either of said boxes longitudinally, or said lever, for the purpose set forth.

No. 30,340. Machine for Sawing Wood.

(*Machine à scier le bois.*)

Charles Davis, East Saginaw, Mich., U. S., 6th December, 1888; 5 years.

Claim.—1st. The combination of two or more saws secured adjustably in a horizontally moving frame, with the pitman I, crank J and shaft K, and the bent table bars O, substantially as herein shown and described. 2nd. A wood sawing machine, in which the saw frame is hinged to the head bar F, which is supported by the guide rods G, sliding through lugs on the posts A, and which is operated by the pitman I and the crank J on the shaft K, and supported by the arm R and cord G, all substantially as described and for the purposes set forth.

No. 30,341. Shaft Supporter.

(*Tuteur de limonière.*)

Henderson M. Powers, Lancaster, Penn., U. S., 6th December, 1888; 5 years.

Claim.—A shaft or thill support, consisting of arm C, rod D, eye G, clamp H and screw I, all arranged and combined substantially as and for the purpose specified.

No. 30,342. Vertical Mule Spinner.

(*Machine à filer verticale.*)

Herbert T. Bardwell, Springfield, Mass., U. S., 6th December, 1888; 5 years.

Claim.—1st An upright mule for drawing and spinning yarns from rovings, having a suitable upright frame, substantially as described, vertical racks, as 462, secured on the ends of said frame, a carriage, substantially as described, having a reciprocating vertical movement on said frame, a shaft, as 467, having a rotary motion on each end of said frame, a ratchet gear, as 466, hung on said shaft and having an engagement with said racks, a series of roving delivery rollers, substantially as described, hung on opposite sides of said frame, having a geared connection with said shaft 467, and winding pulleys, and a series of ropes connecting said pulleys and carriage, whereby the latter is given said vertical movements, and said delivery rollers are given the required rotary motion, combined and operating substantially as set forth. 2nd. An upright mule for drawing and spinning yarns from rovings, having a suitable upright frame, substantially as described, vertical racks, as 462, secured on the ends of said frame, so that they are capable of vertical adjustment, a carriage, substantially as described, having a reciprocating vertical movement on said frame, a shaft, as 467, having a rotary motion on each end of said frame, a ratchet gear, as 466, hung on said shaft and having an engagement with said racks, a series of roving delivery rollers, substantially as described, hung on opposite sides of said frame, longitudinal shafts, as 375, rotating in suitable bearings on opposite sides of said carriage, having drums 471 thereon, a series of roving spools on opposite sides of the carriage resting on said drums, said shafts 375 and roving delivery rollers, having a geared connection with said shaft 467, and winding pulleys and a series of ropes connecting said pulleys and carriage, whereby the latter is given said vertical movements, and said delivery rollers and drums and spools are given the required rotary motion, combined and operating substantially as set forth. 3rd. The carriage, consisting of several pairs of plates, substantially as described, certain of which have thereon the arms *g*, united by the longitudinal angle-irons 308 and 324 secured to the opposite edges of said plates, substantially as set forth. 4th. The carriage, consisting of several pairs of plates, substantially as described, having laterally-projecting webs formed on their inner opposite sides, guide-rolls, substantially as described, hung to rotate between said plates, having an engagement with the edges of the post of the frame of the machine, which extends between said plates, and longitudinal angle-irons 308 and 324 secured to the opposite edges of said plates, substantially as set forth. 5th. The frame posts of the machine, as 461 and 277, having fixed on the sides thereof, one or more punter cups *s*, having elastic material therein, combined with the frame plates, as 463 and 313, having the lateral projections *h* thereon for engagement with said cups, when the carriage reaches its lowest point, substantially as set forth. 6th. The frame plates of the carriage of the machine, as 463 and 313, having on their sides the cams *t* and the projections *v*, combined with the vibratory levers 187 and 206, and plungers 263 and 221 attached to the head of the machine, substantially as set forth. 7th. The carriage, having a series of ropes attached thereto, substantially as described, passing over rollers in the frame of the machine, a counter-balancing weight 500, hung on said ropes of less weight than the carriage, and capable of a vertical movement in the frame of the machine, coinciding inversely with the movements of the carriage, combined with two winding scrolls, as 190 and 205, and a rope having its ends attached to said scrolls, and passing over and engaging with said counter-balancing weight, substantially as set forth. 8th. The combination, with the counter-balancing weight 500, and the carriage to which it is suspended, of a winding scroll, 190 and a like scroll 205, both on one shaft, and a rope having its ends attached to said scrolls, passing over and engaging with said weight, said scroll 205 being capable of adjustment on its shaft, to cause the end of the said rope, which is attached thereto, to be wound on to the higher or lower parts of the scroll, substantially as set forth. 9th. The main shaft 188 of the machine, having a driving gear 142 fixed thereon, a loose sleeve 113 on said shaft, having a driving gear 137 fixed thereon, combined with a driving shaft, as 141, having a geared engagement, substantially as described, with said gears 137 and 142, and a driving pulley thereon, having a frictional engagement with said shaft, substantially as set forth. 10th. The spindle driving shaft 82, having a connection with the pulley 410 on the main shaft 188, as described, and the shipper-rod 34, having the arm 406 thereon, and a slot therein and the collar 64 thereon, having an arm extending under said rod, combined with a pin 415 supported on a yoke, as described, and capable of a movement towards and from said rod, a rocking-arm 61, with which said arm 406 engages two rocking arms, as 420 and 421, engaging with said yoke to move said pin against said rod, a spring 425 to move said yoke and pin upward, a shaft 67 hung in bearings attached to a movable yoke-piece 422 under the bed of the machine, a spring 423 to lift said yoke piece and shaft 67, a collar 68, in shaft 67, having two arms, as *o2* and *o3* thereon, a worm gear 69, having pin holes in its side, a pin *o4* fixed in said gear, and a pin *o5* adapted to be placed in any of said holes, a pulley, as 220, fixed on shaft 67, having a cord attached thereto, a weight, as 51, hung on said cord and the worm 70 on clutch 409, on the main shaft 188, substantially as set forth. 11th. The spindles 428, arranged in two inclined rows, having their steps in a rail on the lower angle-irons 80, outside of the standards, and their bolsters in rails secured to the upper angle-irons 79 on said standards, whereby said spindles cross each other over the axial line of the driving drum, a single driving drum 84, having bands thereon driving said two rows of spindles, and rods, as 432 and 434, extending longitudinally by the sides of the spindle whirrs, combined and operating substantially as set forth. 12th. Yarn-building mechanism, consisting of two parallel rods 15 and 16 capable of a rocking motion in suitable bearings on opposite sides of the machine, and having wire-supporting arms thereon, having suitable weights attached to said rods, substantially as described, to swing said arms and wires towards the yarns, combined with a cam, as 340, having a rotary motion imparted to it by the downward motion of the carriage, substantially as described, a tube 38, enclosing the rod 106, whose lower end rests on said cam, and a rock-shaft 47, having an arm thereon, connected pivotally with said tube, and a second arm thereon connected with each of said shafts 16, substantially as set forth. 13th. The carriage, having the drive-chain 37 attached thereto, a shaft 33, having the chain-wheel 212 thereon, with which said chain engages, having a geared connection, substantially as described, with a shaft *y*, the cam 340 secured on the last-named shaft, the rod 106 passing through the tube 38 and having an internal screw-connection with the latter, and having its lower end resting on said cam, combined and operating substantially as set forth. 14th. The rotating cam 340, the tube 38, having a pivotal connection with the arm 42, of the rock-shaft 47, the rod 106, having a screw-connection with the interior of said tube, and having one end resting on said cam, and adjustable by means of its screw to move said tube to different vertical positions, combined with a rock