

instrument case on the front face of the upper part thereof, in combination with a music sheet and its winding rolls supported by said brackets. 31st. In a musical instrument adapted to be operated at will either by a key-board or a music sheet, a pair of brackets attached to the back of the instrument on the front face of the upper part thereof, in combination with a music sheet and its winding rolls supported by said brackets, a reed-board governed by said music sheet, and a vertical passage leading from the bellows to said reed-board, said passage being arranged against the back wall of the casing. 32nd. In a musical instrument adapted to be operated at will either by a key-board or a music sheet, the vertical music sheet in combination with the casing, and means for supporting said music outside of said casing, but in proximity to the back wall thereof. 33rd. In combination with a music sheet and the casing and operative parts of a duplex instrument, means for supporting said sheet outside of the casing, the said means being attached to the back wall thereof.

No. 15,819. Improvement on Wear Clips for Hainess Irons. (*Perfectionnement des cosses des boucles de harnais.*)

James H. Philpott and George C. Buck, of Rising, Neb., U. S., 21st 1882; for 5 years.

Claim.—1st. An improved wear clip for rings, staples, cock-eyes and other harness irons, adapted to fit the worn portion of the said irons and to be secured thereto. 2nd. A wear clip consisting of wear iron C, filling piece E and attaching ear or wing clips D.

No. 15,820. Improvements on Self-Binding Harvesting Machines. (*Perfectionnements aux moissonneuses-lieuses.*)

Andrew C. Miller, Sparta, Ill., and David M. Osborne, of Auburn, N.Y., U.S., 21st November, 1882; for 15 years.

Claim.—1st. In combination with the double elevating canvas aprons and the grain receiving table located over the main driving wheel, the raking and packing fingers or teeth working above said table. 2nd. The combination of the raking and packing fingers with the intermittent revolving separator T and grain receiving table D. 3rd. The combination of the intermittent revolving separator T with the binding mechanism, having a reciprocating as well as rising and falling movement of its cord carrying and binding arm. 4th. The combination of the raking and packing fingers, the intermittent revolving separator and the reciprocating rising and falling cord carrying binding arm. 5th. The inclined receiving table arranged over the driving wheel, the inclined binding table, the intermittent revolving separator and the packing spring bars *j j j k k k* projecting over the binding table. 6th. The combination of the double elevating canvas aprons, the inclined grain receiving table over the driving wheel, raking and packing fingers working over said table, the intermittent revolving separator, an inclined binder table, and the binding mechanism having a reciprocating and rising and falling motion of its needle, and cord carrying binder arm. 7th. In combination with the intermittent revolving separator, a yielding stop mechanism consisting of the cross-head Y and its latch Z, and adjusting devices. 8th. The combination of the raking and packing fingers arranged to operate above the receiving table D, the revolving separator also working above and over the discharging edge of said table, and the shield boards arranged above said table and on either side of said raking and packing fingers, and said revolving separator. 9th. The combination of the intermittent revolving separator with its cross head Y, sprocket wheel X and its clutch *g*, and intermediate shifting devices operated by the cross-head to throw it out of gear and by the coil spring *h* to throw the same into action. 10th. The raking and packing teeth, the intermittent revolving separator and the binding arm having a reciprocating and rising and falling motion, arranged and combined for joint operation. 11th. The double elevating canvas aprons, the raking and packing fingers, the intermittent revolving separator and the binding devices, the cord carrying arm of which has a reciprocating and rising and falling motion. 12th. The double elevating canvas aprons, the receiving platform arranged over the driving wheel, the raking and packing fingers working over said platform, the intermittent revolving separators and the binding mechanism located outside of the driving wheel, the cord carrying and binding arm of which has a movement to and from the revolving separator. 13th. In combination with the intermittent revolving separator, the locking bolt for holding the same in a fixed position against the action of the needle arm and the grain. 14th. The combination of the cam wheel *p* and cam lever *q* and its connecting devices, with the clutch *g g* and sprocket wheel *i i*. 15th. The combination of the inclined receiving table located over the driving wheel, the inclined binding table located outside of the driving wheel and on a plane below that of the receiving table, and the binding arm, having a rising and falling and reciprocating motion. 16th. The combination of the raking and packing fingers working above the receiving table, the double elevating canvas aprons and the vibrating butt-board. 17th. The double elevating canvas aprons, the receiving table located over the driving wheel, the raking and packing fingers working above said receiving table, the vibrating butt-board and the intermittent revolving separator. 18th. The double elevating canvas aprons, the receiving table over the driving wheel, the raking and packing fingers working above said receiving table, the vibrating butt-board, the intermittent revolving separator, and the binding mechanism having a cord-carrying arm that has a rising and falling and reciprocating motion. 19th. In combination with the double elevating canvas aprons and the vibrating butt-board, the rod *z z* and its connecting devices within reach of the driver in his seat. 20th. In combination with the double elevating canvas aprons, the vibrating butt-board operated by a crank rotated by intermediate gears and receiving motion from the upper roller of the lower elevating canvas aprons. 21st. In combination with the vibrating butt-board and its operating mechanism, the receiving table below and the shield board above it. 22nd. In combination with the intermittent revolving separator and its shafts O, the ratchet wheel *k k* and its pawl. 23rd. Imparting motion to the shaft, which operates the raking and packing fingers, by a sprocket wheel on said shaft connected by a driving chain with the sprocket wheel on the shaft of the upper roller of the upper ele-

vating canvas apron. 24th. Imparting motion to the revolving separator shaft by a sprocket wheel thereon connected by a chain to the sprocket wheel on the raking and packing finger shaft. 25th. The double elevating canvas aprons, the receiving table at the mouth of said aprons and over the driving wheel, the automatic and intermittent revolving separator working above said table, the raking and packing fingers working over said table between said elevating aprons and separator, an intermittent automatic binder arranged to operate outside of said receiving table and separator having a reciprocating cord carrying-arm, arranged to carry the cord over the gavel and form the knot on the under-side of the bundle. 26th. In combination with the clutch *g g* for drawing the binding mechanism into action, the push-bar lever *a a* with its intermediate connections, and the lug *r r* on the gear-wheel *g g*. 27th. The combination of the cam-wheel *p*, the cam lever *q* and its intermediate connections, with the levers *x* having pivot *y* and stud *z*, and operating the push-bar lever *a a*.

No. 15,821. Apparatus for the Manufacture of Starch. (*Appareil pour la fabrication de l'amidon.*)

Anthony Atkinson, New York, N. Y., U. S., 21st November, 1882; for 5 years.

Claim.—1st. The combination, with starch troughs, of adjustable gates or dams. 2nd. The adjustable gates C combined with trough A. 3rd. The combination of trough A, spout C, sliding gates c and adjusting screws d.

No. 15,822. Improvements on Electro-Magnetic Motors. (*Perfectionnements aux moteurs électro-magnétiques.*)

Thomas A. Edison, of Menlo Park, N. J., U. S., 21st November, 1882; for 15 years.

Claim.—1st. The combination, with an electric motor, of a resistance, a lever included in the motor circuit and adapted to be operated by hand or foot, for throwing the resistance in or out of circuit, and means for normally holding the lever at the point to throw in the maximum resistance. 2nd. The combination, with the electric motor, of the resistance, the lever, the retracting spring, the foot treadle and switch.

No. 15,823. Improvements on Fire-Extinguishers. (*Perfectionnements aux extincteurs d'incendie.*)

Miciale Walker, Port Huron, Mich., U. S., 21st November, 1882; for 5 years.

Claim.—1st. As a means for extinguishing fires in railroad cars, a tank having air and water inlets with pipe connections, a water outlet and a pendant pipe extending from the water outlet to the interior of the tank, and of sufficient length to reach any portion of the tank whatever its position. 2nd. The tank A having air inlet *a*, water inlet *b* and water outlet *d*, combined with the hose *e f* and the cut-off *c*.

No. 15,824. Improvements on Self-Lubricating Packing for Steam and other Engines. (*Perfectionnements aux boîtes à étoupe à graissage automatique pour les machines à vapeur et autres.*)

Robert Morrison, St. Louis, Mo., U. S., 21st November, 1882; for 5 years.

Claim.—The method of making self-lubricating packing for steam and other engines by spinning together equal quantities of hemp and cotton fibre into strands, having pulverized plumbago dusted into the fibre while being spun into strands, and which strands are afterwards saturated in a hot mixture of bees wax and tallow.

No. 15,825. Improvements in Electrical Signalling for Telephone Lines. (*Perfectionnements aux signaux électriques des lignes téléphoniques.*)

Thomas D. Lockwood, Malden, Mass., U. S., 21st November, 1882; for 15 years.

Claim.—1st. The combination, with the series of subscribing lines, of a signalling circuit with normally open branches entering the sub-stations, a source of electricity such as a battery, a dynamo or a magneto-electric machine in said circuit, and switches or circuit changes at said sub-stations for connecting the subscriber's lines with said branches, so that the subscriber's signals are over his own line. 2nd. The combination of the subscriber's lines, the signalling circuit with normally open branches entering the sub-stations, the source of electricity such as a battery, a dynamo or a magneto-electric machine, an automatic or gravity telephone switch at each sub-station, and contacts and connections, whereby the mere act of removing the telephone, at any sub-station, from its support establishes an electric connection at that station between the subscriber's direct line and the branch of the signalling circuit, and causes the signalling current to traverse the said direct line. 3rd. The combination, with a switch permanently connected to line, of three contact pieces or points for said switch, connected one through a signal bell to ground, another with a normally charged circuit, and the third to ground through a telephone. 4th. In a telephone exchange system, the combination of a series of subscriber's direct lines, each at its outer terminal normally connected through a signal bell to ground, a dynamo-electric machine or other source of electricity, a supply wire constantly charged with electricity from said source, common to a number of sub-stations, and provided with an open branch extending to each sub-station of the series, and a key or switch, at each station, adapted when operated, either manually or automatically, by the removal of the telephone from its support, to transfer the private line circuit from its normal