thereto, and provided near its front with bar or support C secured to the front springs.

No. 15,815. Improvements in Musical Instruments. (*Perfectionnements aux instruments de musique.*)

Walter F Abbott, (Assignee of Joseph H. Chase,) Montreal, Que., 21st November 1882; for 5 years.

Claim.—1st. The recesses S_2 forming bearings for the journals t_2, in combination with the springs U_2. 2nd. The supports for its journals constructed on end brackets, and a spring secured to each bracket and arranged to confine the journals in the bracket, and together make a support and bearing therefor. 3rd. The combination of a music roller having a journal at each end, and bearings or supports for such journals, each composed of a spring constructed and arranged to confine its journal to the other and stationary part of the support, and the said spring to have an outward movement therefrom and be susceptible of adjustment to control the outward movement of the said spring. 4th. The combination, with a music roller, of the end journals t^2 thereto, and of stationary bracket p_2, each having a recess on its edge, and a spring U_2 having an opening through which passes a headed screw-pin V_2 in the edge of the bracket. 5th. The combination of the crank or feed roller shaft, with a screw-threaded hub having a groove provided with a groove a_3 and a projection b_3, all united in one piece. 6th. A movable box or swell chamber or box located above, and to rest upon the perforated music sheet, as it passes over the throat d. 7th. A movable box or swell chamber provided with apertures opening into it, in combination with the slide V, which has similar apertures and is arranged to open and close the apertures to the swell chamber or box. 8th. In a movable reed box located above, and to rest on the perforated music sheet as it passes over the throat d, and constructed to act as a swell box in the sounding of the reeds. 9th. A tremulant valve r attached to a movable box or chamber, to vibrate with the passage of the air through the reeds. 10th. A tremulant valve attached to a movable box or chamber, to vibrate with the passage of the air through the reeds, and to be placed into and out of such operation. 11th. A movable box or chamber having attached to it a tremulant valve to vibrate with the passage of the air, and constructed and arranged to act as a swell box, and to be opened and closed for tremulant and swell effects. 12th. A movable frame constructed and arranged to carry a box or chamber for either swell or tremulant effects, or both. 13th. A movable reed box located above, and to rest upon the perforated music sheet as it passes over the throat, and provided with a valve and otherwise arranged to act as a tremulant box in the sounding of the reeds. 14th. A removable reed box, constructed and arranged for either swell or tremulant effects, or both. 15th. The combination of a removable frame of a reed box within it, and guided and supported by said frame. 16th. The combination, with bellows g_2, of exhausters h_2 located, in pairs, above said bellows and having the exhausters of each said pair, the one above the other, and connected together to work alternately. 17th. The combination, with bellows g_2, of exhausjers h_2 located in pairs, the one exhauster of each pair being above the other and connected together to work alternately, and the said pairs being set to work alternately, the one pair with the other, or otherwise. 18th. In combination with the bellows or feeders of a mechanical musical instrument provided with openings g_3, the sheet of flexible material i_3 secured in position at its central portion, and left free to vibrate at its outer portion. 19th. The combination of the side or wall f_3 of a bellows or exhauster of a musical instrument provided with perforations g_3, flexible sheet i_3 and fender or guard K_3. 20th. The combination, in a mechanical musical instrument operated by a perforated music strip, a reed box having its reeds g_3 arranged without an intervening space between them, with a cell-board l provided with corresponding cells for the reeds. 21st. The combination of a reed box having its reeds arranged immediately adjacent to each other, and each reed provided with a separate cell. 22nd. The combination, in a mechanical musical instrument operated by a music sheet, of a removable reed box having its reeds arranged immediately adjacent to each other, that is, without intervening spaces or partitions between the reed blocks with a removable cell board. 23rd. A reed box C having a guiding and retaining frame in combination with plate S_1, projections q_1 t_1 and springs u_1. 24th. A removable frame, in combination with the reed box C, which it retains against accidental displacement. 25th. The combination, in a mechanical musical instrument provided with reeds set alternately, the one reeds bass, and the next or adjacent reed a treble, throughout the scale, with a music strip provided with longitudinal rows of notes set also alternately, the one row a bass, and the next or adjacent row a treble, throughout the rows of notes. 26th. A perforated music strip provided with longitudinally parallel, or nearly parallel rows of perforations or notes, said rows of perforations or notes being alternately a bass and a treble row. 27th. A reed box retained in position by journals S_4. 28th. The combination of a reed-board arranged to swing on journals, adjustable rails g_4 and friction rollers h_4. 29th. The combination of the rail a_4, feed roller K_4, adjustable rails g_4 and friction roller h_4. 30th. A reed box having cap l_4 of considerable gravity, thereby dispensing with the necessity of a spring, in combination with a reed-board n_4 and reeds q_4. 31st. In combination with the mechanism for propelling a music sheet in a mechanical musical instrument, a motor consisting of the wheel c_6, axle a_6, frame d_6, shoe f_6 maintained in place and operating as described. 32nd. In combination with the mechanism for propelling the music sheet in a mechanical musical instrument, a motor consisting of a wheel c_6, axle a_6, frame d_6, pawls a_7 having wedge-shaped projections b_7, and shoe c_7.

No. 15,816. Improvements on Electric Motors. (*Perfectionnements aux moteurs électriques.*)

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

Claim—In combination with an electro-motor, a resistance included in its circuit normally, or in a state of rest, and means operated by the motor and arranged to gradually cut out the resistance, as the motor speeds up, and to entirely cut it out, when the motor reaches a desired predetermined speed.

No. 15,817. Improvements in Hoop Cutting Machines. (*Perfectionnements aux machines à tailler les cercles.*)

Fitzland L. Wilson, Saginaw, Mich., U.S., 21st November, 1882; for 5 years.

Claim—1st. The mode of cutting hoops from a log fed with a rolling feed motion to a reciprocating knife, which separates the hoops therefrom, by the concentric action of the two cutting edges of the same. 2nd. The knife V provided with the upturned lip v, and the inclined cutting edges v_1 v_2. 3rd. The toggle levers m m_1, as a means for imparting to the feed screw o a gradually decreasing motion. 4th. The combination of the toggle levers M and M_1, actuated by the rod L, of a stationary pivot N, lever N^1, ratchet Q, feed screw O and spiral wheel P. 5th. The combination of the swinging frame S, carrying the feed screw O, and the retractable pin l. 6th. The trimmer knife V_1, in combination with the hoop cutting knife V.

No. 15,818. Improvements on Automatic Musical Instruments. (*Perfectionnements aux instruments de musique automatiques.*)

Gustavus W. Ingalls, Worcester, Mass., U. S., 21st November, 1882; for 5 years.

Claim.—1st. A music sheet for an automatic musical instrument having an opening adapted to allow the feed roll of said instrument to turn therein, without taking hold of said music sheet. 2nd. A music sheet having a buckle at one end, in combination with a winding roll having a strap for attachment to the buckle, and a recess to receive said buckle when said music sheet is wound on said roll. 3rd. In combination with a winding roll and a music sheet attached at one end thereto, a rewinding roll consisting of a sleeve, a shaft and a friction clutch operating as described. 4th. In a rewinding roll, the combination of an outer sleeve, a pair of detachable end pieces, and a shaft with a block set into a recess of said shaft, and a spring which forces said block against said sleeve. 5th. The combination of the winding and rewinding rolls, both on the same side of the reed board, with the music sheet and with the detachable guide roll on the other side of the reed board. 6th. In combination with the feed rolls, winding and rewinding rolls and the music sheet, a spring tension device which holds the music sheet against the winding roll. 7th, A roller journalled in a movable bar, in combination with a winding roll, a music sheet and springs which act on said bar to force said roller against said music sheet and winding roll. 8th. In combination with a music sheet and the body of a musical instrument, a movable rack or frame, an upper feed roll, a presser roll or bar and a spring or springs operating to hold both of said rolls simultaneously against the music sheet. 9th. In combination with a pair of brackets, a rack frame or cap provided on each side with two pivots, both near one end of the frame, a presser roll attached to the other end of the frame, an upper feed roll located above a line between the two forward and the two rear pivots, and springs bearing on said feed roll so as to hold both rolls down, when the rack is in operative position. 10th. A presser roll in combination with a trough-shaped bar to which it is journalled, and a hinged cap or frame to which said bar has a pivotal attachment. 11th. A frame or rack having a presser roll or bar at one end of it, a spring pressed feed roll at the other end and an intervening pivot, in combination with a stop which prevents said presser bar from being forced down against said music sheet beyond a certain point. 12th. A presser roll or bar held by yielding pressure, in combination with a stop which prevents it from being forced against the body of the instrument. 13th. A presser bar provided with means for preventing it from being pressed toward the instrument beyond a certain point. 14th. In combination with a reed-board having two parallel sets of reeds and reed chambers, and a single intervening set of reed ducts, a spring pressed automatic cut-off for one of the sets of reeds, and a push-pin provided with a bevelled block for opening said cut-off. 15th. In combination with a reed-board, a valve bar adapted to be held against the mouths of the reed ducts to close the same. 16th. In combination with a reed-board and external valve-bar, means for locking said bar against the mouths of the reed ducts. 17th. In combination with the reed-board and valve-bar, a spring which holds said bar away from the reed ducts. 18th. A pair of pivoted arms, and a crank shaft or cam shaft for operating upon them, in combination with a reed-board and a valve-bar attached to said arms. 19th. A valve bar journalled in pivotal supports, in combination with a reed-board and devices for moving said bar and supports toward and from said reed-board. 20th. In a reed-board, a valve bar for closing the reed ducts and pivoted supports for said bar, in combination with a feed-roll on the other side of the pivots of said supports, and a rock shaft with cams and spring operating to lock down either said feed-roll, or said valve-bar. 21st. In a pair of pivoted arms provided on one side of their pivots with a valve-bar, and on the other side with a feed-roll, in combination with springs for forcing said roll down and said valve bar up, and a rock shaft provided with cams which are adapted to lock said valve-bar down and said feed-roll up, or to lock both of them in a raised position. 22nd. In combination with the reed-board, a sounding-board hinged above the same, and means for vibrating said sounding board. 23rd. An upper feed roll for an automatic musical instrument in combination with means for positively raising it from the lower feed roll. 24th. An upper feed roll in combination with pivotal arms to which it is journalled, and a cam shaft operating against said arms. 25th. A movable lower feed roll in combination with the upper feed roll, the case and the operating devices of a musical instrument. 26th. A lower feed-roll journalled in a hinged piece, in combination with a spring which forces said feed-roll toward the upper feed-roll. 27th. A lower feed roll movable away from the upper feed roll, in combination with a lever, whereby said removal is effected. 28th. In a movable lower feed roll, in combination with a spring which forces the same towards the upper feed roll, and a lever which forces it away therefrom. 29th. A rack having detachable side plates, in combination with a crank shaft feed-roll and valve-bar, all attached to said plates. 30th. 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