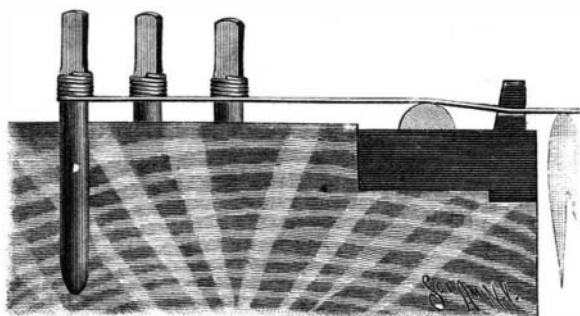


THE MASON & HAMLIN PIANOS AND ORGANS.

The increased knowledge of music and love of harmony that of late years have spread throughout the United States make it more than a matter of sentiment and national pride that America should be worthily represented to the world as a producer as well as a user of musical instruments. We illustrate in the present issue some of the productions of a typical American firm which already, by the manufacture of reed organs, has earned enviable notoriety throughout the world. They have more recently entered a new field, and are producing grand and upright pianos which, in their general good qualities and features of construction, especially as affecting the stringing, seem destined to fill as honorable a role as is now filled by their predecessors, the Mason & Hamlin organs.

Of late years the manufacture of pianos has settled practically into that of two classes, the grand and the upright. The square piano is generally considered out of date and very few are manufactured. The firm of Mason & Hamlin restrict their manufacture of pianos to the grand and upright forms. The distinguishing peculiarity of their instruments is the arrangement of stringing. We show both the new and the wrest pin systems of stringing, and on the most cursory inspection it will appear that the new system adopted by the firm of which we are speaking is the more mechanical. The other or "wrest pin" system, in which the wrest plank performs the duty of holding the pins around which the



THE "WREST-PIN" MODE OF STRINGING.

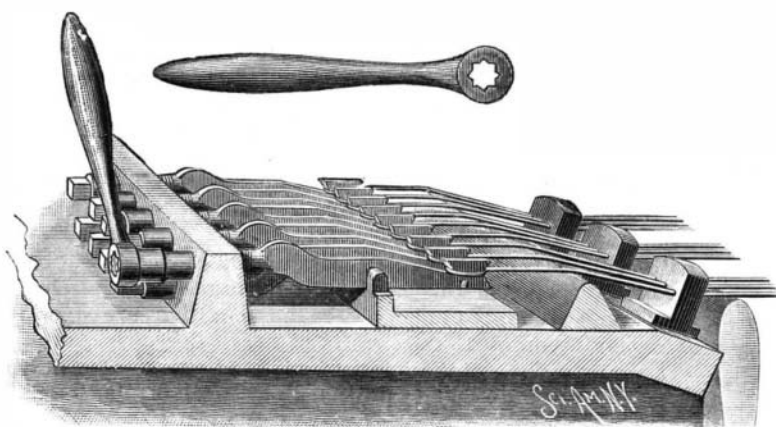
wires are wound, is characterized by numerous defects. Although made of the most carefully seasoned wood and built up by the most approved methods, the wrest plank is inevitably subject to atmospheric influence, which causes the wood to expand and contract. The tension of the strings, being entirely dependent upon the friction between the pins and the holes, is very liable to vary. One reason for this is that every time such a piano is tuned, more or less wear comes upon the holes in the wood, and the latter, being a comparatively soft substance, is bound to yield thereto. Besides this, in the hands of an incompetent tuner, the wear upon the wrest plank, tending to enlarge the holes and loosen the pins, may be so great that such a person will seriously damage an instrument.

Under the influence of atmospheric changes, the shrinking and expanding of the wood before alluded to is a cause of still further deterioration in the same direction, as the holes are inevitably enlarged by such cause. In order to tighten or loosen the strings with precision, a number of trials are always necessary, and sometimes the last degree of tension is given by slightly bending the pins toward or away from the sounding board. Of course a very serious element of destruction is here developed. The strings are also very liable to break as they are continually wound and unwound about the wrest pins in tightening and loosening. Repeated bending of a wire will break it eventually. In liability to heat changes the wrest pin system is defective. When a pin breaks, it is quite a serious operation to repair the damage, as the hard

cylinder of steel, which is completely buried in the wood, can only be removed with great difficulty.

THE MASON & HAMLIN SCREW-STRINGER.

The Mason & Hamlin system of stringing is so simple, and so obvious from the drawing, that a few words



THE MASON & HAMLIN STRINGER, AS APPLIED TO GRAND PIANOS.

can describe its details. On the surface of the iron main frame a rib is cast, the strings are fastened to lugs with screw ends, these ends go through the rib, and a square-headed nut is screwed on each one. By turning the nut one way or the other the string is tightened or loosened. In this arrangement it will be remarked that all the strain comes directly on the iron plate, and that the tension is due to screw resistance, and not to simple friction. The wires start directly from the lug, passing in almost a straight line to the agraffe and binders, so that the strain upon them is substantially a straight one. The chief reason for the breaking of wires in a piano is the bending back and forth upon the wrest pin. Here this feature is entirely done away with. Moisture, of course, has no effect upon such an arrangement, and heat and cold are also practically without influence. If the strings tend to lengthen by rise of temperature, the same change affects the frame, so as to keep up the tension upon the strings, whose correctness of pitch, therefore, is entirely independent of all climatic and hygrometric changes.

The tuning by the ordinary system is a tentative process, the key has to be turned back and forth until the proper pitch is reached, the last adjustment being often attained by a slight jar given to the tuning key. If the last movement is not in the right direction, the piano will not stay in tune. In the new system, by means of the star wrench, the string is tightened or loosened definitely until the proper pitch is reached, without any attempt at hitting the pitch by chance. In old times, when gut strings were used, requiring

low tension, the system of frictional tuning pins was quite sufficient, but it seems obvious that in the modern piano forte, with its wire string at exceedingly high tension, some more efficient way of straining these strings is necessary.

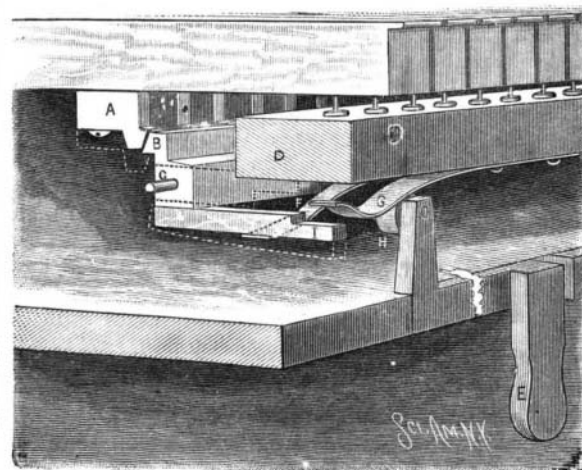
REMARKABLE CAPACITY TO STAND IN TUNE.

In standing in tune, the most remarkable results are attained by these instruments. They require only about one quarter the tuning of an ordinary instrument, and their exemption from deterioration of pitch is extraordinary. When the tuner has once learned their manipulation, he can tune them very much more rapidly than those made on the wrest pin system.

THE PEDAL-POINT STOP.

The organs manufactured by this firm embody in their construction many features of interest. We illustrate the action of the "pedal-point" stop, which is now used on the Liszt organ. It is operated by the knee, pressing a knee stop one way or the other. Referring to the drawing, this stop is represented by E, and in its movements to right

or left carries with it a roller, H. A long block, covering one or two octaves, is pivoted at C, and at B the block is cut so as to form one element of a latch. Each of the keys within the range of the block is provided with a corresponding latch element, of which one is shown at A. The spring, F, pressing the arm, I, up-



"PEDAL-POINT" MECHANISM IN MASON & HAMLIN LISZT ORGAN.

ward, keeps the latch in condition for acting. If now a key within the range of the latch is depressed, the long block is rotated and the part, A, of any given key catches under the latch, B. The spring, F, causes this action to take place. Referring to the drawing, the stop, E, under these conditions is pushed to the left. If, however, it is pushed the other way, the spring, G, much stronger than the spring, F, is allowed to press upon the lever, I. This draws back the latch block, so that any key held down is released and rises to its place, and any new key pressed down will not stay there. When the latch block, however, is allowed to act, one or more keys within its range can be depressed simultaneously, and will then be held down. Every new key thus depressed releases all the others.

The Lisztorgan, to which these improvements have been applied, is remarkable for the purity of its tone. It is a reed organ on the American plan, working by a partial vacuum. It possesses great freedom from reediness in sound. The reed has been improved and given so peculiar a shape as to avoid this difficulty.

The Eolian harp stop resembles the Eolian harp. Its tones are produced by two sets of reeds of two feet pitch, which are tuned a trifle out of unison, so that a slight beat is heard when they are in action.



MASON & HAMLIN GRAND PIANO.

Destruction of our Elms.

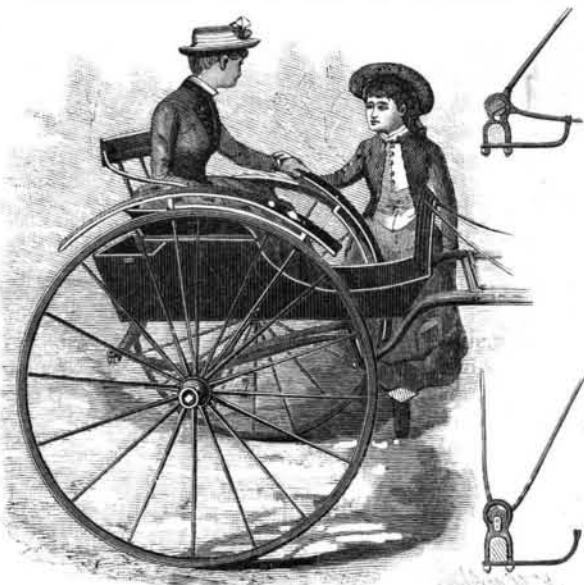
The elm leaf worm has made its appearance again this year, destroying the foliage on the elms in our parks and on the highways in the vicinity of New York. The depredations of the larva of the imported elm leaf beetle have now become so great in the Eastern States that Mr. F. Bronncoke, of Westchester County, who seems to have made a study of the subject, thinks it is quite probable that all the European species of the elm, if not the American, will soon be destroyed. The beetles seem to prefer the European elms, but as soon as these are stripped of their leaves they go directly to the indigenous elms. All the remedies thus far tried or suggested are unsatisfactory, owing to the difficulty of application. On small trees the worms may be destroyed with kerosene emulsion, carbolic acid solutions, creosote, tar water, etc., but on very tall and large trees the cost of applying insecticides would be far more than the trees are worth. Furthermore, it is a waste of time for one man to apply remedies while his neighbor allows the beetles to breed unmolested, for these insects have wings and know how to use them when in search of food.

To Tan and Color Sheepskins with Wool on.

Tan in alum dissolved in water. Proportion: 1 pound alum to 1 gallon water. Then wash wool clean with plain soap. To color, use aniline of any shade you desire. Dissolve 1 pound aniline in 2 gallons water; strain before using; then float skin in a dye box, wool down. See that they lie flat, and let remain till color or shade you desire comes; then take out and run through clear cold water, and hang up in a hot room to dry. For plain white, wash the skins well, after tanning as described above. If not white enough, hang up in a small room and bleach with powdered sulphur. Set in a pail in center of room burning. Be careful to have no escape of the sulphur fumes, and have the room air tight.—*Shoe and Leather Reporter.*

AN IMPROVED WHEEL FENDER FOR CARRIAGES.

A wheel feeder and dress protector adapted for use on any kind of road vehicle, capable of being used as a fender upon the road and as a dress protector in mounting and dismounting, being easily placed in either position by a person seated in the vehicle, is illustrated herewith, and has been patented by Messrs. Arthur C. Rogers and Henry Stenz, of Faribault, Minn. In the upper end of a clip fastened on the axle is produced a compound recess consisting of a circular aperture, and a lower central intersecting aperture, in which is mounted a hub, from which extend arms or rods supporting a fender of the usual construction, a bar curved in conformity with the fender, and just below it, bracing and sustaining the arms extending from the hub. Upon the outer face of the disk-like hub, mounted in the clip fastened on the axle, is a central projection, of a form to admit of an easy and firm fit in the lower portion of the compound recess in the upper end of the clip. From the upper rear wall of the circular aperture in the hub projects a stop pin to limit the rearward throw of the device, and on the threaded lower ends of the clip is fastened a stop bar, with its forward free end turned up and bifurcated. The small views show in section the position of the parts when the device is used as a fender and as a dress protector. In the perspective view, the fender on the

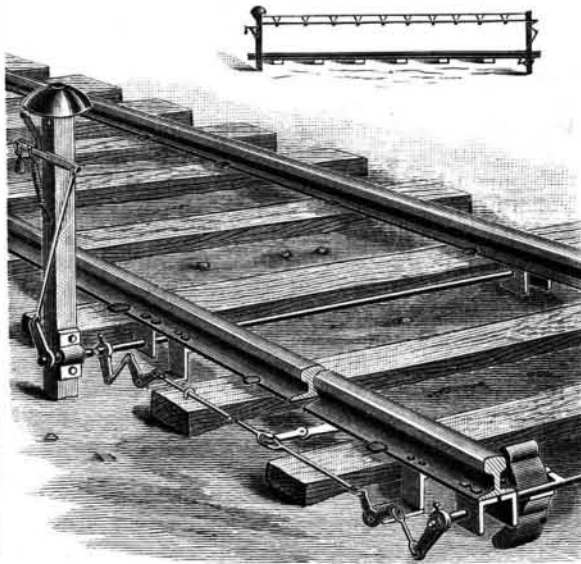


ROGERS & STENZ'S WHEEL FENDER FOR CARRIAGES.

right hand wheel of the vehicle is in the usual position for travel on the road, the central projection in the outer face of the hub then fitting in the lower portion of the compound recess in the clip. The device is moved from this position to that of a dress protector, as shown on the left hand wheel, by slightly raising the hub in the clip, when it drops forward until the front arm supporting the fender engages the bifurcated end of the forwardly extending and upwardly curved stop bar, bringing the fender in position to act as a guard over that portion of the tire adjacent to the step.

AN IMPROVED RAILWAY CROSSING ALARM SIGNAL.

A simple and efficient device for automatically sounding an alarm as a railway train approaches a crossing is illustrated herewith, and has been patented by Messrs. George D. and Christian Rathmann, of Blair, Neb. A rock shaft is mounted transversely beneath the rails, upon brackets secured to their under sides, with one end of the shaft extending beyond the rails,



RATHMANN'S RAILWAY CROSSING ALARM SIGNAL.

to the side of the track, and carrying a lever arm connected to a pivotally supported bell crank lever, the latter being also in connection, by means of a wire suitably supported along the track, with a distant bell crank lever mounted in close proximity to a post carrying a gong, the bell crank lever being also connected with a hammer arranged to strike the gong. Just within the line of one of the rails, and in position to be struck by the flanges of the car wheels, a tripping dog is mounted upon the transverse rock shaft, the dog being normally held in nearly vertical position by a counterpoise, so that it will be turned downward and return again to position as each wheel of a train passes over it, thus operating the bell crank lever at the side of the track, and, through the wire stretched along to the post at the crossing, these impulses will be communicated to the hammer which strikes the gong, thus sounding an alarm at each approach of a train, the hammer being drawn back after each stroke by a suitably arranged spring or weight. The wire supported along the track may be carried by proper supports from posts placed at suitable distances apart, or it may be carried along the ties, or in a tube suitably arranged in connection therewith.

How to "Manage" Sewing Machines.

To the average manufacturer, whose business does not justify the keeping of an expensive expert, there is no piece of machinery that gives so much trouble and annoyance as the sewing machine. Very few men have patience enough to wrestle with one of them if it happens to be refractory. This ingenious and indispensable piece of mechanism, like most other things, is docile and tractable, however, when in the hands of one who understands it. Not long ago a Philadelphia merchant essayed to adjust his wife's sewing machine. After working a short time he became interested. He passed from that state of mind by regular stages to agitation, disgust, and to a towering rage. The result was a grand *denouement* with an ax and a succession of vigorous strokes.

This great trouble about amateur tinkering with a sewing machine is that too much is done. When any portion of the mechanism fails, it is usually for some trifling cause. Two or three little faults will make a combination calculated to prove intensely exasperating. The first endeavor then should be to find out just what is the matter. In this sort of doctoring, as in the science of medicine, the first, and by far the most difficult, thing is diagnosis. Having formed a reasonable theory of cause and effect, proceed with your remedy, and if a trial shows your judgment to have been defective, undo or replace the part altered before going any further. To begin with, one thing may be wrong which escapes your notice. Hence each time you make a change, the difficulty is in consequence multiplied. To become master of the art of repairing a sewing machine, it is requisite to understand the principles upon which the stitch is formed and the work fed. Little manual skill is needed. The parts are made by machinery, and are interchangeable, obviating the necessity for filing and fitting. Any observing and competent fore man or woman of a fitting or stitching room can learn to repair the modern sewing machine.

The breaking of silk or needles and the skipping of stitches can be remedied nine times out of ten in a few moments by turning a screw, or adjusting some part that has become displaced. If the needle is dull, or bent, or sharp in the eye, discard it at once and try again. If your machine breaks the silk, examine the

broken end and determine whether it was cut or torn, also measure the end down from the take-up, so as to decide at what point in the revolution the trouble occurred. Turn the wheel slowly and watch the silk pass around the shuttle, and see that every part touched is smooth and clean. Many times a machine can be made to resume its good behavior by simply taking out needle and shuttle, giving it a thorough cleaning and oiling, without loosening or disturbing the adjustment, and then starting afresh. Of course, these machines occasionally defy for a time the best efforts of experts; but in very many cases they will readily yield to gentle treatment.

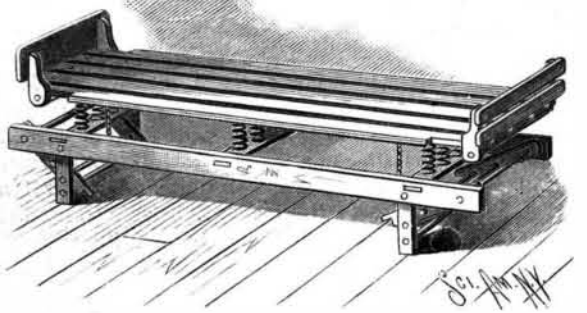
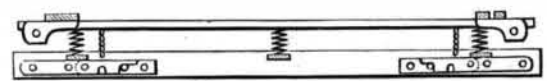
In the various fabrics on which a machine is used there is quite a diversity in the thickness and character of the work required. Frequently a machine working badly on one branch can be easily coaxed into performing valuable service in another. It is a good plan for every one having the care of sewing machines run by steam power to occasionally lubricate the points of greatest wear, such as the take-up cam, for instance, with heavy oil, meanwhile keeping each supplied with oil of lighter density for daily use. Wheel feed machines are always more expensive to keep in repair than the drop or step feeds, and hence should never be used when the latter will answer the purpose just as well.—*Shoe and Leather Reporter.*

Progress of the Ship Canal between Manchester and Liverpool.

An extraordinary meeting of the shareholders, for the purpose of approving a bill now before Parliament to authorize certain alterations in the plans of this work, was lately held. In the course of the proceedings it was stated that there were 56 steam excavators, 73 locomotives, 2,367 wagons, 50 steam cranes, 79 miles of temporary railroad, and 6,000 men employed. The excavations during the month of May amounted to 21,371 cubic yards of rock and 1,009,052 yards of soil. The bill provides for an alteration in the plans which gives 114 acres of water space, against 100 in the old scheme, the quay space being 152 acres, against 83, and the quay frontage $5\frac{1}{2}$ miles and 4 miles respectively. There is thus a large increase in the accommodation provided, while the cost is reduced by £23,000. In the course of a few remarks, the contractor, Mr. Walker, said that he had 48,000,000 cubic yards of excavation to carry out, which would mean about 1,000,000 yards per month. This rate was now exceeded, and before the end of the summer he hoped to excavate 2,000,000 yards per month. The bill was unanimously approved, and the general tone of the meeting was a confident one.

AN IMPROVED FOLDING COT.

A cheap, strong, and simple folding cot, in which the slats are supported directly by the springs, and which, when folded, occupies but small space, has been patented by Mr. John C. Porter, of No. 181 First Avenue, New York City, and is illustrated herewith, in perspective and a sectional view of the cot when folded. The side pieces of the main frame are secured together by cross pieces, to which are attached the coiled springs which support the slats. Folding legs are pivoted to the under side of the side pieces near their ends, being secured together in pairs by rounds, notched holding arms, also pivoted to the side pieces,



PORTER'S FOLDING COT.

and held together in pairs in the same manner as the legs, being adapted to fold up between the side pieces with the legs, or, when the latter are turned down, to serve as stops and braces therefor. When the cot is folded, the legs and holding arms lie flat against its bottom, between the side pieces, but to arrange it for use, the legs and folding arms are pressed downward, and the notches in the latter placed in engagement with the rounds of the legs. The ends of the slats are also provided with folding head and foot pieces.

The French government has organized a competitive exhibition of machines for decorticating ramie, to take place in August next at Paris, and 30,000 francs have been appropriated to defray expenses.