CARILLON MACHINES.

Most of our readers have heard church bells play tunes. At one period such an arrangement was very common, and on the Continent of Europe the system is brought to considerable perfection; but in England it is only within a recent period that the employment of machinery for the production of airs from church bells has become popular.

As the method of producing tunes from church bells is but little understood, it will be well to preface our description of the machine we illustrate by a few words of explanation.

Church bells are caused to sound in two ways—either, that is to say, by swinging them, and so causing the clappers to strike them; or by the aid of hammers of various weights, according to the size of the bell, caused to rise and suffered to fall on the bell. Peals are rung by hand, the bells being swung; clocks always strike the bell with a hammer, the bell being at rest. The hammer is raised by a wire, which pulls down the hammer tail, the wire being worked by a lever, the end of which is caught by a cam on a revolving barrel in the clock below. It is obvious that if a number of bells are all fitted with hammers, and the number of cams is sufficiently great, and the cams are properly arranged, that a tune can be played by a mere multiplication of the device by which a clock is made to strike the hours on a single bell.

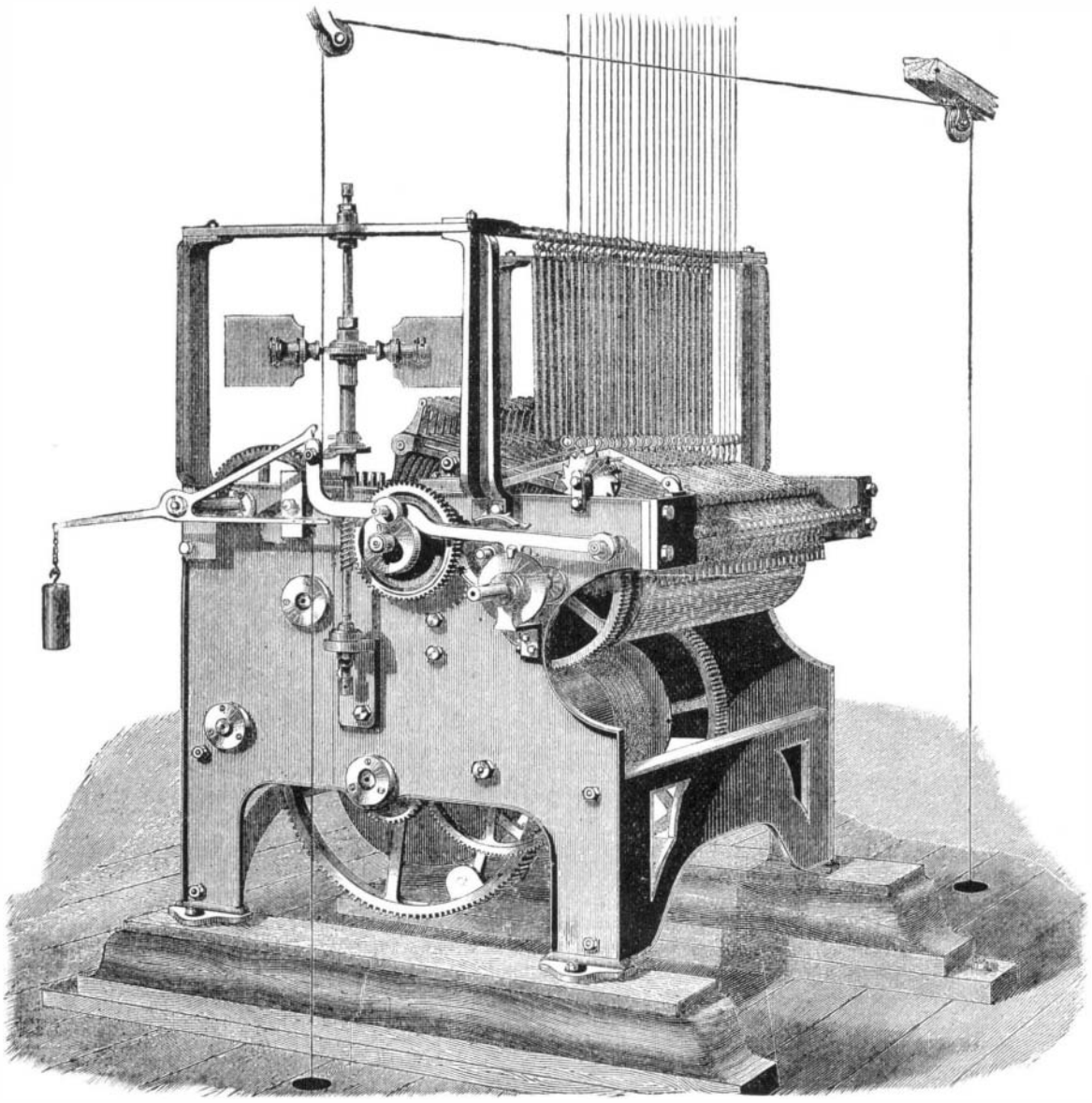
The carillon machine embodies this arrangement, only, instead of cams, a number of short pins are set in a revolving barrel, and these pins catch the toes of levers connected by wires with the hammer tails in the bell chamber above. The pins are set or pricked in precisely in the same way as the little points in the barrel of a musical box. If our readers will bear the musical box in mind, and fancy that the whole is enormously enlarged, and that the toes of the levers take the place of the springs, the arrangement will be quite clear. Such is the old fashioned, or, as we may term it, positive carillon machine: and its defects are very serious.

The hammer, after it has fallen, can only be lifted by the rotation of the barrel; and as the time of dropping the hammer depends entirely on the rotation of the barrel, it is obvious that the barrel can only revolve at a slow speed, and much time is lost in lifting the hammer. The result is that a rapid musical passage cannot possibly be performed. Another result is that, when the small bells, the high notes, come to be played, the barrel meets with less resistance, and revolves faster than when it has to deal with the deep notes and large bells. It follows that the air is played out of time.

These difficulties are overcome by the invention of Messrs. Gillett and Bland illustrated in the engraving—which explains a principle, and not details. This principle we may call negative. The hammers are always kept raised, and are only allowed to drop by the agency of the musical barrel. The instant they fall they are lifted again; and so long as the lifting is accomplished quickly enough, the time of lifting has nothing to do with the production of the air. That is determined solely by the musical barrel, which, being relieved of the work of lifting, has little or no strain on it, can be made small and light, and will always revolve at the same rate, and so insure that the tune shall be played in perfect time. It also follows that the most rapid passages can be played with the greatest ease and precision.

The second engraving is intended to show the gear for working one hammer. It must be multiplied in proportion to the number of hammers, but the parts are all repetitions of each other. It will be understood that this engraving does not show details, but simply illustrates a principle.

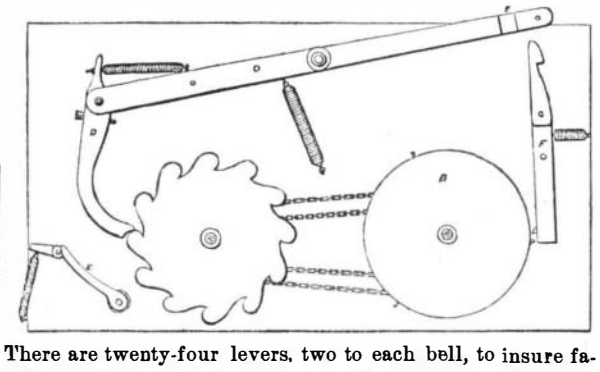
The musical barrel, B, is set with pins in the usual way. A is a cam wheel of very peculiar construction, operating a lever, C, by what is, to all intents and purposes, a new mechanical motion, the peculiarity of which is that, however fast the cam wheel revolves, the tripping of the lever is avoided. In all cases the outer end must be lifted to its full hight before the swinging piece, D, quits the cam. The little spring roller, E, directs the tail, D, of the lever into the cam space, and when there it is prevented from coming out again by a very simple and elegant little device, by which certainty of action is secured. At the other end of the lever, C, is a trip lever, F. This lever is pulled toward C by a spring, and whenever C is thrown up by the cam wheel, F seizes it and holds it up; but the wire to the bell hammer in the tower above it is secured to the eye, G, so that, when D is lifted, the eye, G, being pulled down, the hammer is lifted. The pins in the musical barrel, B, come against a step in F; and as they pass by, they push F outwards and release C, which immediately drops, and with it the hammer, so that the instant a pin passes the step, F, a note is sounded. But the moment D drops, it engages with A, which last revolves at a very high speed, and D is incontinently flung up again, and the hammer raised, and raised it remains until the next pin, B, passes the step on F, and again a note is struck. It will be seen, therefore, that, if we may use the phrase, B has nothing to do but let off traps set continually by A; and so long as A sets the traps fast enough, B will let them off in correct time. But A revolves so fast and acts so powerfully that it makes nothing of even a 3 cwt. hammer, much less the little ones; and thus is obtained a facility of execution heretofore unknown in carillon machinery. We venture to think that our readers will agree with us that such a carillon machine as we illustrate is about as ingenious a combination of mechanism as is to be met with in the range of the arts.



GILLETT AND BLAND'S CARILLON MACHINE.

Our large engraving shows a machine on this principle recently put up in the parish church at Shoreditch, London, by Messrs. Gillett and Bland. This plays fourteen tunes on twelve bells—one of the finest peals in London, the tenor weighing no less than 34 cwt. Two barrels are used, which can be changed by hand. The peal ranges from CC to G.

Fig. 2.



There are twenty-four levers, two to each bell, to insure facility in playing rapid passages without driving the cam barrel too fast. The motive power is supplied by a weight of 9 cwt., allowed to fall 72 feet, and wound up every twenty-four hours. The performance of the machine leaves nothing to be desired.

The corporation of Manchester have decided upon having a great clock and carillon for their magnificent new town hall. The clock is to strike the hours upon a bell of seven tuns, and to chime the four quarters on eight bells, the time to be shown upon four 16 feet illuminated dials. An automatic gas apparatus will be fitted to the clock for turning the gas up and down, and so constructed as to suit all seasons of the year. The clock will also have an electric connection with the Royal Observatory at Greenwich. The carillon machine is to play thirty-one tunes—a fresh tune for every day in the month—on seventeen bells weighing altogether about thirty tuns, and will also have barrels for changes similar to ringing a peal, and an ivory key board, the same as a pianoforte, attached to the machine, so that any musician can play tunes upon the bells with the fingers as easily as playing a pianoforte or organ. Taken altogether, this will be the largest work of the kind in the United Kingdom, and will cost over $35,000.

Mound Explorations.

Dr. W. W. Ranney, of Lansing, Iowa, communicates to the *Journal*, of that place, an interesting account of an examination, recently made by himself and other parties, of an ancient mound in Union City township, Iowa.

The mound is not in the form of the burial mounds or *tumuli*, but forms a circle, the circumference of which is 700 feet. The ridge or elevation averages about 25 feet in width, leaving a circular inclosure 210 feet in diameter. The hight of the ridge or mound is about three or four feet from the surface of the ground. On opening it, pieces of broken pottery, made of a bluish clay and partially pulverized mussel shells, were discovered; stones, showing evidence of having been used for hearths or supports for the earthen vessels while being used for cooking food; collections of fish scales, bones of buffalo, deer, badger, bear, fish, and birds; but no evidence of human bones. The long or marrow bones of all animals were found broken or split, supposed to have been done for the purpose of extracting the marrow for food, which circumstance is also noted in the *Kfokenmöddings*, or kitchen middens, of Denmark. One peculiarity noticed was that in different localities the ornamentation of the pottery was dissimilar. For instance, all found on one spot was ornamented with horizontal circular rings; all found in another place was ornamented with zigzag lines, and at another, near by, they had the same zigzag lines with dots in the angles. This was accounted for by the supposition that each family had its own particular method of ornamentation, by which they recognized their property. These vessels were quite capacious, the diameter of one having been fourteen inches at the mouth. About one and three quarter inches below the mouth they abruptly widened out six inches all around, making the largest diameter twenty-six inches. The bottoms had been rounded in such a manner that they never tipped over; but let them be set down as they might, they oscillated till they finally, when still, sat in an upright position. For the purpose of handling, the vessels were provided with handles on two opposite sides.

Besides the beforementioned articles, copper ornaments, one inch wide at the base and one and a half inches from base to apex, were found, the form being the same as a perforated flat iron, as if to attach some additional ornament or a string to fasten in the ear

The conclusion was that the mound was once the habitation of a community of families; that huts or wigwams were built in a circle, and the piles of burnt stone unearthed represented a hearth in a hut, on which the pottery sat while cooking, and around each of which a separate family warmed and fed themselves, and that each family had a separate distinct mark on their vessels by which they were known from their neighbors in the next hut or wigwam.

The central inclosure was used for their games, dancing, and pleasure, and perhaps, in case of attack from wild beasts or their fellow men, as a place for the aged, the young, and the women to flee to while the warriors met their encroachments outside the circle of dwellings. Forty rods south were found some 83 burial mounds or *tumuli*, out of which were procured parts of human skeletons.

Preserving Photo Sensitive Paper.

Prepare a number of sheets of cheap blotting paper by immersing them in a solution of bicarbonate of soda and letting them dry. These may be used over and over again. Then sensitise as much paper as is likely to be wanted during the next three or four weeks, interleave it with the blotting paper, and place the whole under a weight.

Sensitive paper thus treated may be preserved ready for use for a long time.

RATS detest chloride of lime and coal tar