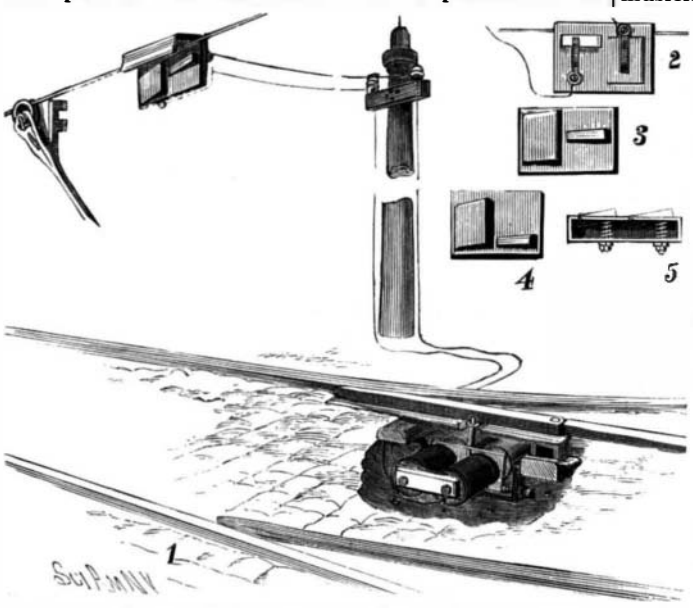
AN ELECTRICALLY OPERATED RAILWAY SWITCH.

The illustration represents an electrically operated switch mechanism designed to automatically switch the cars from one track to another without action on the part of the motorman. The improvement has



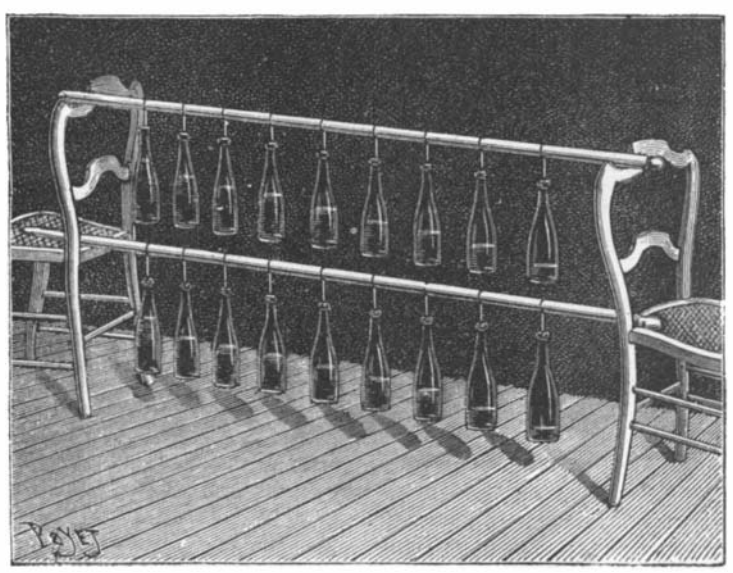
BROWNE'S ELECTRICALLY OPERATED RAILWAY SWITCH.

been patented by Walram S. Browne (Manufacturers' Paper Company), box 683, New York City. The main view illustrates the application of the improvement, and the small figures show further details of the contact devices. The improvement contemplates there being several switches on the line, and adjacent to each one are switch-operating magnets with pivotally mounted armature engaging a switch point in such way that when either of the magnets is excited the switch point will be correspondingly moved. The trolley wire is held in place in the usual way, and on it, near each switch, is a stationary contact device comprising a frame or casing with angular upper portion, and having at one edge a clamp which engages the wire, the contact plates preferably moving in recesses or openings in the casing when engaged by the contacts carried by the car. The car contacts are lugs bent outwardly from one side of a plate at the end of the trolley pole, and are in electrical communication with the trolley wheel, to utilize the trolley wire current to operate the switch mechanism. As shown in Fig. 2, the contact plates have springs to hold them normally in position to be engaged by the car contacts, and the springs are connected by circuit wires through the trolley wire supports with the switch-operating magnets. As shown in Figs. 3, 4, and 5, the casing of the stationary contacts is hollow, and the contacts are hinged at the edges of openings, with their outer faces inclined, and have stems on which are coiled contact springs. As the car approaches one of the switches, one of the car contacts engages the stationary contacts on the trolley wires to actuate the switch point and set the switch as desired, the car contacts being arranged to actuate only the particular switch or switches designed to be moved.

THE MUSICAL BOTTLES.

The accompanying figure represents a simple and easily constructed musical instrument. It consists of a number of ordinary glass bottles filled with a certain quantity of water, the height of which is varied according to the pitch of the note to be obtained. After a few tentatives, it will be possible to reproduce all the notes and their octaves, including the sharps and flats. The tuning of the apparatus, however, requires a good musical ear.

The bottles are suspended by the neck, by means of strings, from two broom handles resting upon the backs of two chairs. In order to produce the sound, the bottles are struck with two rulers, or, better, two drum sticks. With this arrangement, airs in two parts may be played; and there may be two performers, one playing on one side without interfering with the performer on the other side. In the hands of good musicians this apparatus is very pleasant to listen to. —G. Tissandier.



THE MUSICAL BOTTLES.

Large Gifts to Libraries.

In a recent number the Critic gives detailed lists of the large gifts of money that have been made for libraries in this country. The splendid record it has to present it hopes may inspire other rich men to go and do likewise. Here are the facts collected:

New York Public Library.—Astor Foundation—John Jacob Astor, $400,000; William B. Astor, upward of $550,000; John Jacob Astor, $700,000. The value of the total endowment of the Astor Library on December 31, 1894, was $2,105,871.87. Lenox Foundation—Mr. James Lenox's gifts to the Lenox Library from 1870 to 1880 (the year of his death) were, in 1870, $300,000; 1871, $100,000; 1872, $100,000; 1874, $130,000; 1875, $85,000; 1876, $20,000; total, $735,000, besides books, works of art, etc., and ten lots for the library's site. The value of all these gifts has considerably increased—especially that of the real estate. Tilden Foundation—The amount already handed over by the Tilden estate to the New York Public Library is something over $2,000,000. The total amount the library is expected to realize from this source is set at $2,125,000.

By the will of the late John Crerar, the John Crerar Library, of Chicago, was made his residuary legatee, but with a provision that the executors of the estate should use their discretion as to the time of the payment of this bequest. Under this will the directors of the John Crerar Library have received from the trustees and executors of the estate the sum of $1,851,131, and they have been informed that the trustees still hold for the library property of an estimated value of $863,060. This would make the total amount of Mr. Crerar's bequest $2,714,191.

The bequest of Mr. Walter L. Newberry to the Newberry Library, of Chicago, was one-half of his estate, which, at the time the bequest became available and was set apart for the library, was valued in round numbers at $5,000,000, thereby making the endowment to the library $2,500,000.

The gifts made by Mr. Carnegie to the library in Pittsburg, Pa., bearing his name are $800,000 for the erection of the main building, $300,000 for the erection of branch buildings, and an endowment of $1,000,000 for the maintenance of the art gallery and museum—a total of $2,100,000. Altogether Mr. Carnegie has within the last few years given more than $4,000,000 to the cause of public education in its wider sense—for the libraries erected by him almost invariably are devoted to music, art, and science as well. The principal of these are at Allegheny ($300,000), Homestead ($400,000), Braddock, and Johnstown, Pa.; Fairfield, Iowa; and Edinburgh, Ayr, and Dunfermline, Scotland.

Mr. Enoch Pratt offered the city of Baltimore, on January 21, 1882, a library building, costing about $250,000 and an endowment of $833,333.33, on condition that the city create a perpetual annuity of $50,000, payable to a board of trustees, named in the first instance by Mr. Pratt and having the right to fill vacancies in their own number. This offer was accepted and the library founded.

The property bequeathed by Dr. Rush for the establishment and support of the Library Company of Philadelphia amounted to about $1,060,000.

The endowment which Mr. Mortimer Fabricius Reynolds made for the Reynolds Library, of Rochester, consisted of real estate, which is valued at present as being worth certainly over $500,000, and probably $600,000.

Mr. Leonard Case gave during his life to the Case Library, of Cleveland, $20,000 in government bonds, besides smaller sums from time to time, amounting in all to, say, $25,000. In 1876 he gave real estate, then valued nominally at $300,000, but now worth $500,000. The total value of the endowment of the Case Library is now estimated at $600,000.

The Minneapolis Public Library was built, and is at present sustained, for the most part, from the product of taxes. Of the original cost of the building ($360,000), however, about $61,000 came from private subscriptions, usually of $5,000 each. Moreover, there is combined with the library, for the term of ninety-nine years, a proprietary institution, the Minneapolis Atheneum, which has funds amounting to $200,000. This property was the gift of a certain Dr. Kirby Spencer, a citizen who died about 1860, bequeathing his estate in this way. At the time of his death, the property, which was in real estate, was far less valuable than now. It yields a varying income, sometimes above, sometimes a little below, $8,000 a year. This sum is used to supplement the funds derived from taxes, amounting during the present year to about $54,000.

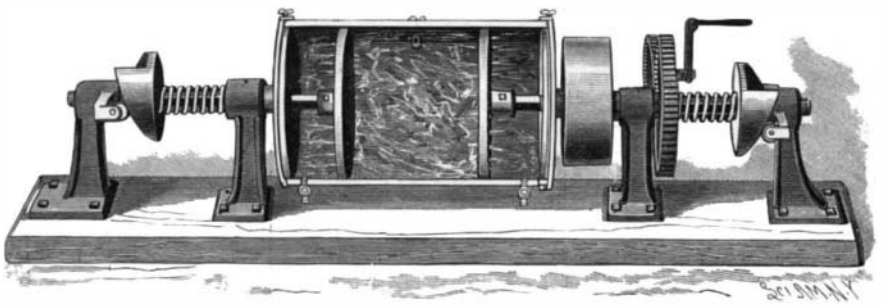
The executors received in 1881, under the will of Judge Forbes, of Northampton, Mass., $252,260. The money was suffered to accumulate for ten years, in accordance with a provision of the will and a vote of the town. In 1894 the executors delivered to the trustees appointed by the city a building and lot which had cost $128,994, $1,350 of other non-productive property, and funds amounting to $355,565. This is the real endowment of the library, and not the amount originally received.

Mr. George Peabody endowed the Peabody Institute, of Baltimore, with $1,240,000, but as the Peabody Institute, besides a library, includes a conservatory of music, an art gallery, and a course of lectures, and all of these are in part or wholly supported from the income of this endowment, it is almost impossible to state just what the endowment really is.

To the above list must be added the recent bequest to Princeton University of a library which is to cost over $600,000. The design of the building will be carried out upon the lines so common in the English universities. It is to be made the most complete and perfect university library of its kind in this country.

AN IMPROVED WASHING MACHINE.

A machine designed to rapidly force the washing liquid many times through the clothes with the least possible expenditure of labor or power, and without danger of injury to the clothes, is shown in the accompanying illustration, and has been patented by William Acheson, of No. 2307 Penn Avenue, Pittsburg, Pa. The cylindrical clothes receptacle has in its periphery a removable cover, through which are introduced the washing liquid and the clothes to be washed, and its heads have hubs which turn in bearings on suitable standards. The water is forced through the clothes by reciprocating



ACHESON'S WASHING MACHINE.

perforated plungers or dashers whose squared shafts slide in and turn with the hubs, there being on one of the hubs a pulley to be connected by belt with a source of power, or the machine may be operated by hand through a gear wheel on the hub, which meshes with another gear wheel actuated by a crank. The reciprocating motion is given to the plungers by double cams on the outer ends of the plunger shafts, the cams engaging friction rollers to give inward impulses, while the return motion is effected by springs coiled on the shafts. The cams being double, two full strokes are given to the plungers during each revolution of the receptacle, and therefore, with the machine running at a speed of twenty-five revolutions a minute for fifteen minutes, the washing liquid will be forced through the clothes and back again 750 times. The receptacle has outlet faucets for discharging the wash water when desired.

How Piling is Driven in Bavaria.

Henry A. Carpenter, United States commercial agent at Furth, Bavaria, writing of the opening in that country for American manufacturers, says:

"The manner of driving piling here would indeed make an American contractor smile. The method is as follows: A simple block and fall arrangement is rigged over the pile and to the end of the rope running on the pulley, and fastened to the weight are about twenty-five smaller ropes with hand pieces. Twenty-five men grab these and at a signal from one of their number, all pull together. The weight goes up about eighteen inches or two feet, when the men relax their hold and the weight drops. It is unnecessary to state how long it takes by such a method to drive a pile, or how much more effectively a small dummy engine would do the work. In the erection of buildings the same tedious process is employed; for every stone to be raised requires the strength of a pair of horses and about fifteen men tugging away at the ropes. The machinery manufactured and used in America for such purposes would do away with this clumsy method."