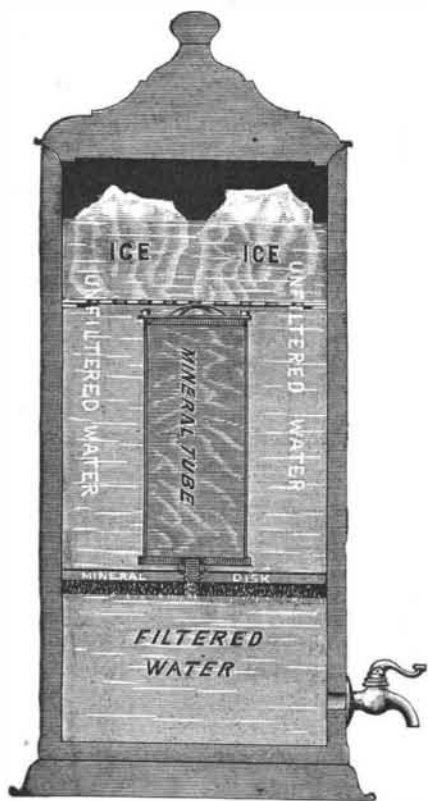


GERM-PROOF WATER FILTER AND COOLER.

A filter so inexpensive that it is designed to find a place in every family, and which can be kept entirely clean and sweet without being taken apart and joints broken, is shown in the illustration, which represents a combined cooler and filter. This filter is designed to free water from microbes and all suspended matter



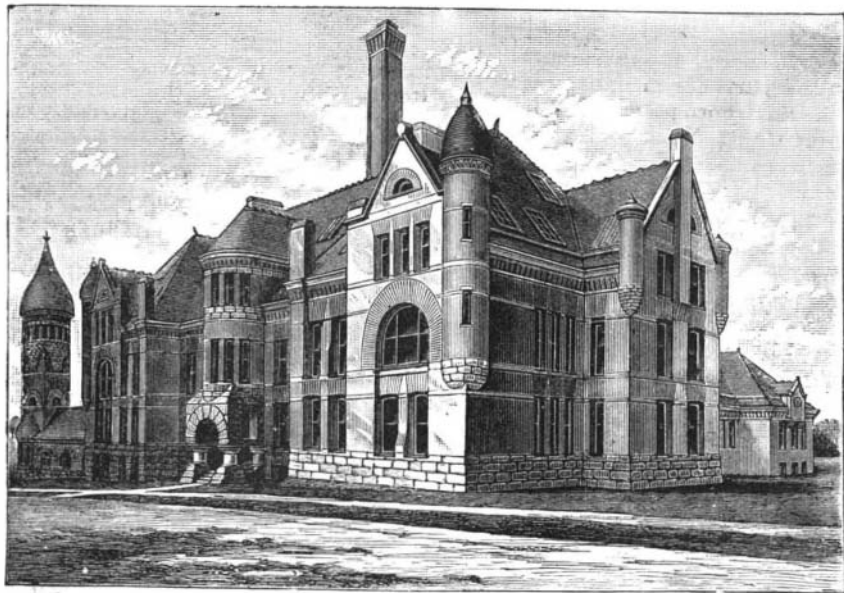
THE McCONNELL FILTER.

and disease germs, and is highly indorsed by the medical fraternity for this purpose.

It has a large porous tube made of exceedingly fine mineral flour. The water is filtered by passing through the minute pores of the cylinder to the compartment below. The impurities are all retained on the outer surface of the cylinder, from which they are easily washed. The ice is placed on a grate in the upper part of the unfiltered water chamber, and when this grate is removed the cylinder can be taken out to be washed, or it may be washed in its place either by being flushed or by brushing its surface. These filters are also made in another style to be attached to pipes by which water is supplied under pressure, and they are in each case made in various sizes to furnish any desired quantity of water. They are manufactured by the McConnell Filter Co., of Buffalo, N. Y.

THE NEW ENGINEERING BUILDING OF THE PENNSYLVANIA STATE COLLEGE.

The Pennsylvania State College is situated at State College, Center County, Pa., and was founded in 1859. Recently the college has grown rapidly and the new engineering building, which was dedicated February 22, 1893, will soon enable it, we hope, to attain a high



THE PENNSYLVANIA STATE COLLEGE ENGINEERING BUILDING.

place among the technical institutions of the United States. The building itself is built of red pressed brick with brown stone trimmings. Although the architecture of the building is not above criticism, still on the whole the effect is very pleasing. The main building is three stories in height and the entire group measures 266 by 208 feet, so that it will readily be seen that the effect when viewed from the campus is imposing. The interior arrangement is admirable, and shows much forethought on the part of both the architect and the professors. The basement contains the machinery, etc., including machines for testing the strength of ma-

terials, the value of lubricants, cement, etc. A triple expansion engine of 150 horse power is provided, and will be largely used by the students for experimental purposes. Two engines are also connected with the dynamos which generate the electricity for the 1,000 incandescent lights distributed among the various buildings. The ventilating apparatus is very complete, fresh air being furnished in such quantities that the air is changed every ten minutes and can be warmed by passing over steam coils if desired. Six boilers of 80 horse power each furnish heat to the various buildings and also power for actuating the ventilating fans. The boilers are connected with the various buildings by tunnels. On the first floor are offices, model rooms, etc., while in the annexed buildings are the machine shops, driven by electric motors, a foundry with an 18 inch cupola, a forge shop provided with a blower and smoke exhaust-er. In an adjoining building is the wood turning shop. The second floor of the main building (for the shops are only one story high) is devoted to recitation, lecture rooms, etc. From all appearances, the institution is now in a position to give a good course in engineering, and as for technical education, the plant will enable it to compete with the Pratt, Drexel and Armour Institutes.

AN IMPROVED RAILWAY BLOCK SIGNAL.

By means of the block signal system shown in the illustration, the engineer of a train entering a block may tell whether or not there is a train within the block, its location, if there be any, and the direction in which it is going. Fig. 1 is a plan view indicating two blocks of six miles each, provided with the improved apparatus, as shown in perspective in Fig. 2, and Fig. 3 represents the signal or indicator case, partly in edge elevation and partly in central section. The signal indicator cases are arranged in pairs, with their backs adjacent and a lamp between them, and the hollow supporting post communicates with a conduit, through which and the post are laid wires from contact brushes alongside the track to magnets in the indicator cases, there being one magnet behind each figure or indicator mark upon each dial. The contact brushes consist of metal plates having upwardly extending springs or points, and they are placed in position to be hit by a brush upon the locomotive, being placed a mile apart, as shown in the view, each mile being marked by a brush, and each side track being also provided with one of the brushes. The dial has seven marked spaces, 1, 2, 3, 4, 5, 6, and 0, and one of the magnets is arranged directly behind each. The blocks may be of any length found most convenient.

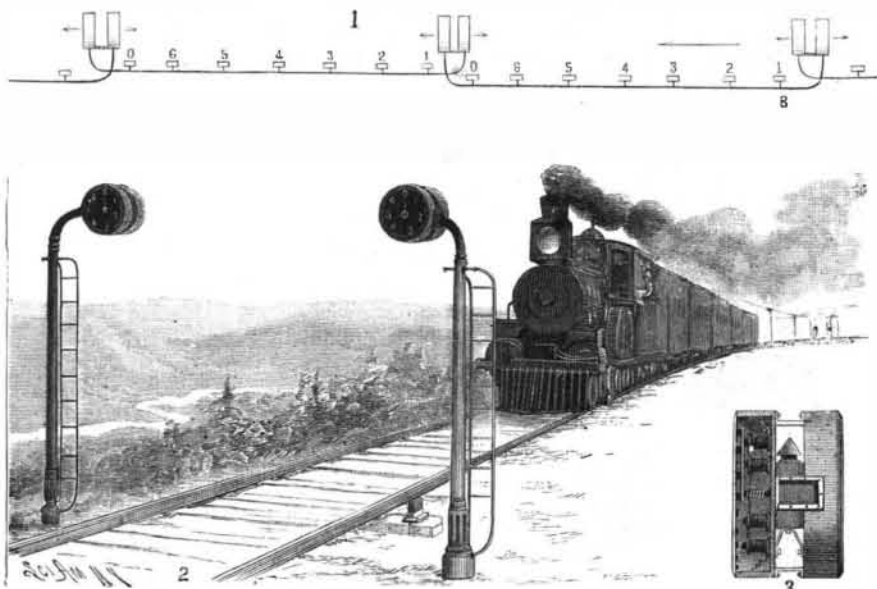
The indicators on one side of the track are used to indicate trains going in one direction and those on the other side indicate oppositely moving trains. A ground wire is connected to one pole of each of the magnets, and runs down through the hollow post to the ground, to complete the circuit through the magnets and energize them, whereby the indicator hand is drawn to the proper magnet and indicator mark. A wire runs from the contact brush at the side of the track, at the entrance to the block, to the magnet behind the "1" on the dial facing the direction from which the train enters; another wire runs from the same brush to the magnet behind the "1" of

the indicator case facing in the opposite direction, at the other end of the block. At the end of the first mile of the block, connection is made from the contact brush to the magnet behind the "2" on the dials, and so on until the train passes out of the block, the brush at the exit being connected with the wire running to the magnet behind the "0" on the dials, while from the contact brush of the siding a wire is run to "8" on the dials, when the train passes a switch or siding. The contact brush on the locomotive is charged with an electric current from a battery or dynamo in any convenient position; but the invention provides for a

modified arrangement, whereby the electric current may be supplied by a wire strung alongside of the track. Similar indicators may also be provided in the offices of train dispatchers, etc. Further information relative to this improvement may be obtained of the inventor, Mr. Robert D. Peters, No. 35 North Meridian Street, Anderson, Ind., or of Mr. Charles L. Wait, Winamac, Ind.

IMPROVED METHOD OF STRINGING PIANOS.

The improved method of stringing pianos, which has been used exclusively by the Mason & Hamlin Com-



PETERS' RAILWAY BLOCK SIGNAL.

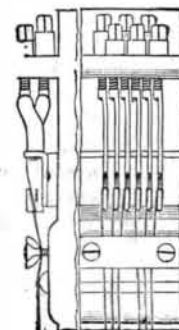
pany for a number of years, is a great advance on the method formerly employed. The system is clearly shown in the accompanying cut. It discards entirely the old pin block. A rib is cast on the surface of the iron main frame, and the strings are fastened to lugs with screw ends, which go through the rib, a square-headed nut being screwed to each one. Turning the nut one way or the other, the string is tightened or loosened. All the strain comes directly on the iron plate, and the tension is due to screw resistance, and not to simple friction. The wires, starting directly from the lug, pass in almost a straight line to the agraffe and binder, so that the strain upon them is a straight one, and this does away with the bending back and forth which was the case when the old method was employed, and which was the principal cause of the breaking of the wires. In the new system, the entire frame being of metal and the strings being attached to it at both ends, instead of one end being secured to wood, as in the wrist pin system, there is a compensation, as in a watch. 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 climate and hygrometric changes. In tuning by the ordinary system the key has to be turned back and forth until the proper pitch is reached. In the Mason & Hamlin system, the string is brought to the required pitch without any attempt at hitting the pitch by chance. The new system has three marked points of superiority to the old method. The pianos stay in tune much longer, are more durable, and the quality of tone is more refined and musically pure.

The Mason & Hamlin pianos have attained a marked success since their introduction, and the constantly increasing number in use shows how thoroughly the many points of superiority are appreciated by lovers of music everywhere.

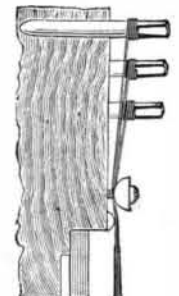
An illustrated catalogue describing the new method of stringing will be sent to any one on application at the main office of the company, 152 Tremont Street, Boston, or any of their branch offices or agencies.

The Brooklyn Library.

The Brooklyn Library is celebrated for the excellence of its catalogue, the work of the late S. B. Noyes. This catalogue is noticed in the "Encyclopædia Britannica." The library numbers 105,000 volumes. In the reference department we notice the "Scientific American Cyclopædia of Receipts" occupies a prominent place, and is in constant demand. "Experimental Science" is also constantly in use. The present librarian is Mr. W. A. Bardwell, and under his able management the library greatly flourishes.



STRINGING-NEW METHOD.



STRINGING-OLD METHOD.