PNEUMATIC CLOCKS.

Compressed air, which has for some time past formed an important factor in mining, diving, marine engineering, locomotion, and analogous uses, has lately been utilized in a very ingenious manner in operating all the clocks of a city or district simultaneously. Some time since we gave an illustration and description of a pneumatic clock exhibited at the Paris Exhibition and in public use at Vienna. The entire mechanism of a pneumatic clock system, as in use at present at Paris, consists of three distinct parts: the central clock, the receiving clocks, and the tubes for conveying compressed air to the several receiving clocks. At the central station air is compressed to a pressure of about five atmospheres by means of a double piston compressor, and is stored in a large tank of about twenty-five cubic feet capacity. From this main reservoir the compressed air is conducted into a second reservoir, in which its pressure is regulated at seven tenths of an atmosphere by means of a very simple automatic contrivance. Every minute this distributing reservoir is placed in communication with the distributing tubes by means of a distributing clock, shown in Fig. 1.

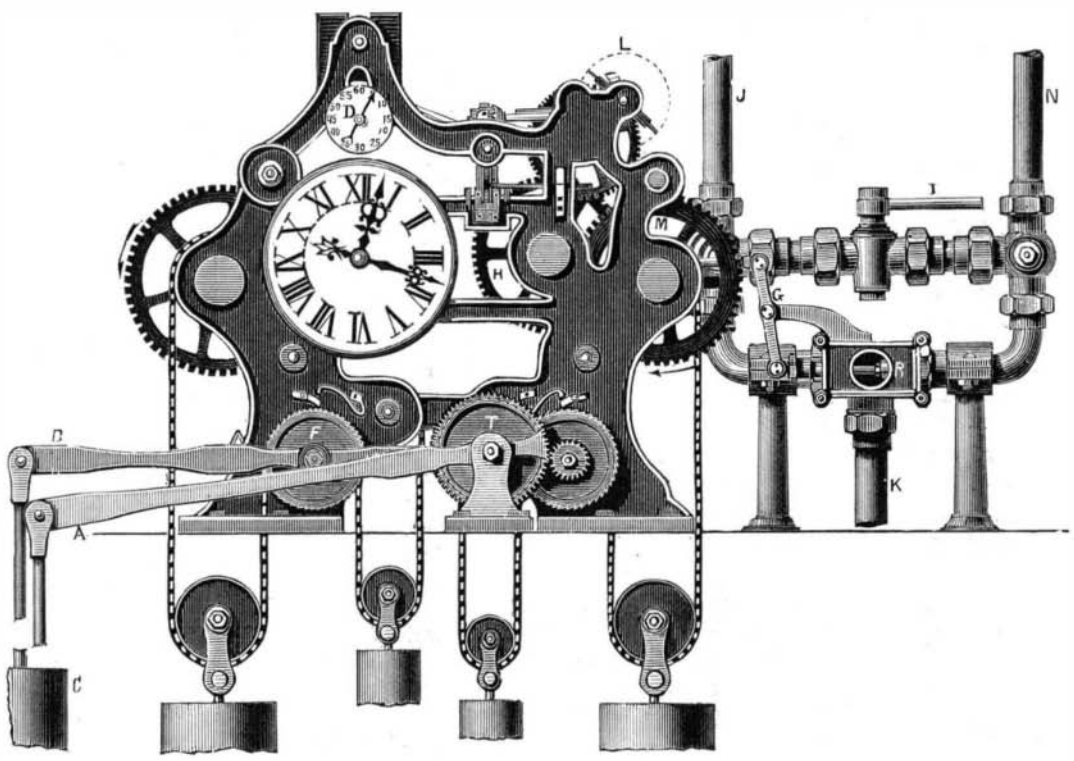

Fig. 1.—DISTRIBUTING CLOCK.

In the annexed engravings, which we take from *La Nature*, the works on the left hand side are those of an ordinary clock, and the mechanism on the right hand side operates the distributing slide valve, R. The second dial of this clockwork is at D. At the beginning of every minute the compressed air from the distributing reservoir is admitted into the distributing box through the tube, J, and is conveyed to the distributing tubes by the tube, N. After about twenty seconds a movement of the lever, G, places the slide valve into its second position, and the tube, N, is in communication with the tube, K, which opens into the air, when the tube, J, is then neither in communication with the tube, R, nor with N. The slide valve, R, rests in this position for forty seconds, that is, until the minute is completed, when another displacement, as described above, establishes a communication between J and N. The compressed air is also used to wind up the weights of the clockwork, by means of the cylinders, C, and levers, A and B, as shown in Fig. 1. The slide valve, R, which may be replaced by a three-way cock, I, is actuated by the clockworks, which are adjusted and regulated every day or hour from the observatory. The central station is provided with duplicate apparatus, so that if one distributing clock is out of order or disturbed in any way the other can be set in operation in a few seconds. The tube, N, is connected with the several mains which convey the compressed air into the various districts or precincts into which the city is divided. The mains are made of wrought iron, are about one and one sixteenth of an inch in diameter, and are connected with lead tubes three fifths of an inch in diameter, for conveying the air into the houses. The tubes leading to the several stories are one quarter inch in diameter, and are connected with lead or rubber tubes one eighth inch in diameter, communicating with the several clocks and preferably colored the same as the wall paper or woodwork of the room, so as not to be easily perceptible. With a pressure of seven tenths of an atmosphere, and permitting the compressed air to pass through the tubes for twenty seconds, any number of clocks can be operated at a distance of one to two miles from the central station.

The mechanism of the receiving clocks, shown in Fig. 2, is alike in all cases, and is entirely independent of the size of the dial or the location of the clock. A small bellows, resembling that used in pneumatic call bells, is in communication with the tubes conducting the compressed air from the central office. Every minute the pressure of the air raises the bellows, and a rod attached to the upper bellows-head actuates a lever which engages with a wheel provided with 60 teeth, which is rigidly secured to the minute hand arbor. The wheel rotates the distance of one tooth every minute, and a weighted pawl on the other side of the dial checks this movement. The hour hand is rotated by means of the usual dial wheels. By means of a second bellows the clocks may be arranged to strike. The ordinary spring and weight clocks can be easily transformed into pneumatic receiving clocks.

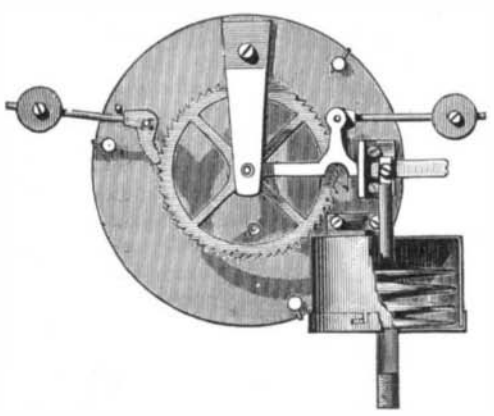

Fig. 2.—RECEIVING CLOCK.

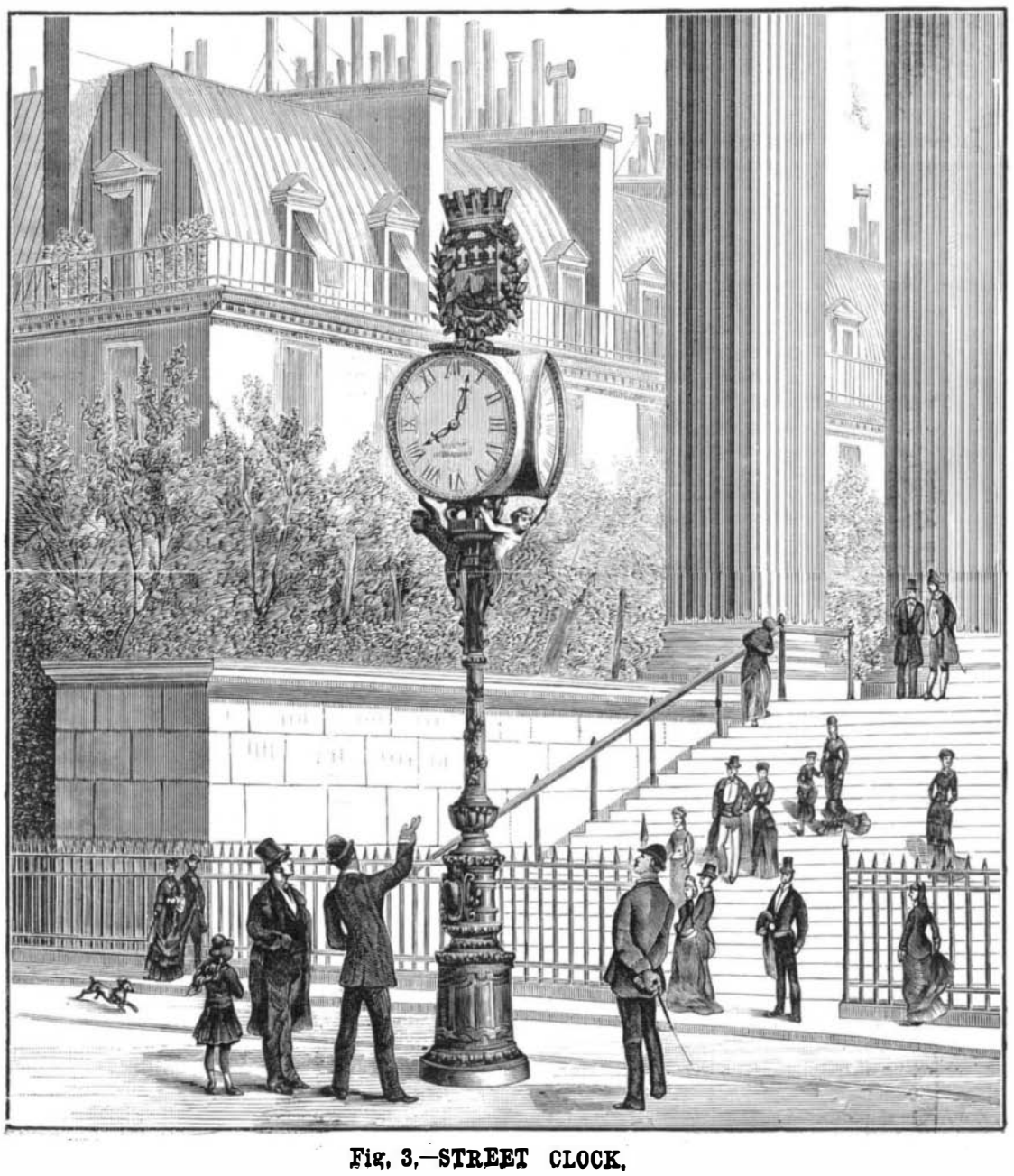

Fig. 3.—STREET CLOCK.

Many of the principal hotels, railway stations, public offices, courts, etc., of Paris, are provided with the pneumatic clock; and public pillar or street clocks, which are illuminated at night, have been erected in several parts of the city. We are informed that a company has been organized in the city of New York for the purpose of introducing the pneumatic clocks into this and other cities.

ENGINEERING INVENTIONS.

Messrs. Youngblood & Holmes, of New Orleans, La., have patented a simple device for preventing the collection of scale on the crown sheet of a boiler. It consists of a pan arranged immediately over the grate bars on the bottom of boiler, and partly covered and provided with discharge pipe to prevent the deposit of scales on the boiler sheet and carry them into the mud drum.

Improvements in the construction and arrangement of the devices for opening and closing the lock gates and sluice gates of canal locks, have been patented by Mr. Thomas Milette, of Three Rivers, Quebec, Canada. The object of these improvements is to facilitate the working of the gates and to furnish a water way or sluice under the floor and lock gates for the entrance and emission of the water.

Mr. Charles A. Read, of Bridgeport, Conn., has patented an improved water meter and motor, which is so constructed as to run with little friction, to be sensitive to the least motion of the water, and to have very little leakage.

Mr. Henry Case, of Brooklyn, N. Y., has invented an improved apparatus for sinking and removing piles. It consists of one or more tubes with suitable couplings, by means of which forced currents of water may be made to create auxiliary currents to act directly upon the submarine bottom beneath and about piles or other objects, so that the sand, mud, gravel, etc., are washed away, allowing the pile or obstruction to sink or admitting of its being more readily raised.

Mr. Samuel L. Marsden, of New Haven, Conn., has patented an adjustable device for correcting and compensating the wear on the pitman bearings, toggle bearings, toggles, and movable jaw or jaws of stone breakers and crushers like that of Blake and others. The invention consists of an adjustable toggle block provided with a rounded convex or concave back, and of a toggle block wedge provided with a concave or convex face, in which concavity or convexity the back of the toggle block fits, the said toggle block being vertically adjustable by means of a screw or screws, and being capable of a laterally rocking motion because of its articulation with the toggle block wedge. This invention

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