

**Troublesome Building Foundations.**

There has been so much discussion of the merits of obtaining a foundation for high buildings on the treacherous soil of Chicago that it may not be amiss to give a summary of the views of the two architects that seem to be the especial champions of opposite systems. The Chicago *Herald* boils the long letter by Mr. Dankmar Adler, recently published in the *Economist*, to the following: "He claims at the outset that the present methods employed in the foundations of tall buildings, however ingenious they may be, are insufficient for the ultimate development of the requirements of tallest business buildings. He then cites the grain elevators, which are subjected to very great pressure and variation of pressure, and are also usually built upon treacherous soil. These stand upon pile foundations. This simple fact seems to have escaped notice. The theory of the isolated pier construction seems justifiable, because a careful computation of weight to be sustained and careful workmanship have made it possible to secure so slight settlement and deviation that architects have lost sight of the desirability of securing the nearest approximation to an unyielding structure. The Cook County court house, which is built on piles, the Chicago city hall and the United States government building, which are built on concrete, are cited. These buildings have created a prejudice against pile and also against monolithic foundation; but the trouble was not with the theory upon which they were built, but with the execution. They were constructed wrongly and unintelligently. Then came Frederick Baumann's admirable treatise in favor of the theory and practice of the system of isolated pier construction as applied to the erection of tall buildings on compressed soil. Gradual improvements, moreover, came upon this isolated pier theory, such as the use of the cantilever system. Now at last comes the reintroduction in the construction of high buildings of the long neglected and undervalued system of pile construction. The Northern Pacific station on Harrison Street is built successfully on piles. The German theater upon Randolph Street is to be built on piles. In digging upon this latter site the characteristic soft Chicago mud was found to a depth of from forty-two to forty-eight feet below the cellar floor. Then was found hard tunnel clay. Fifty-foot piles have been driven in till the points penetrated securely this clay. The heads of the piles have been cut off three feet below the sewer level or water line, and are covered with a grillage of oak timbers. Upon this is formed a foundation of concrete and I beams, the out part of which act as cantilevers. Thus is formed an unyielding substructure for the foundations. The pile construction is conceived to be as well constructed as, and to be loaded no more heavily than, the foundation used successfully under the Northern Pacific depot."—*Northwestern Architect*.

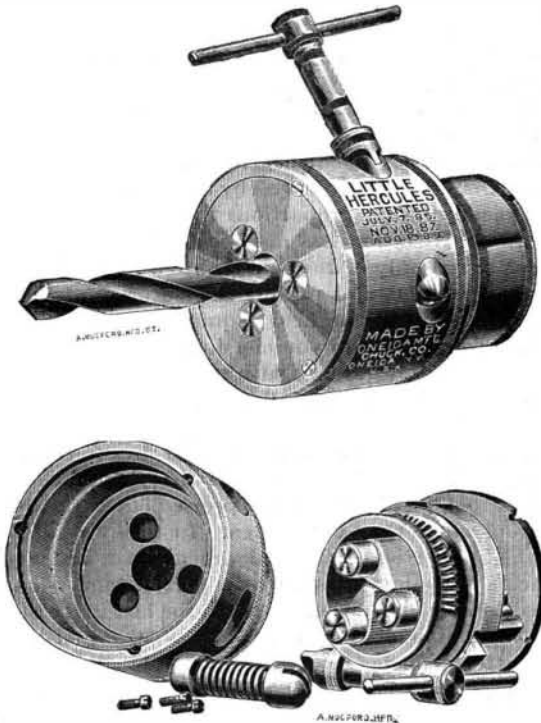
**PORTABLE ELECTRIC LIGHTING PLANT.**

We illustrate a portable electric light plant constructed by Hayward Tyler & Co., London, for a large dock company. It is mounted upon a frame carried by four wrought iron traveling wheels, and is fitted with a pole for two bullocks. The boiler stands in the center, the engine being at one end and the dynamo at the other. The boiler is 6 ft. 6 in. high by 2 ft. 9 in. in diameter. The firebox is crossed by two tubes 8 in. in diameter. The engine has a cylinder 5 in. in diameter by 6 in. stroke, and is of the inverted type with Pickering governor. By means of a belt it drives the dynamo. This is compound wound to give 20 amperes of current at a pressure of 10 volts, when running at 650 revolutions per minute. It supplies four incandescent lamps of 200 candle power each. Each lamp is provided with a strong enameled iron reflector fitted with a wire guard, and a length of twin flexible cable. A plant of this description will be very useful in many kinds of outdoor work.—*Engineering*.

By the use of a new machine, potatoes may be planted in a straight line and with the hills at equal distances apart.

**AN IMPROVED CHUCK.**

The drill chuck shown in the illustration has been recently placed upon the market by the Oneida Mfg. Chuck Co., Oneida, N. Y. It is simple and durable in construction, very powerful and accurate. The holding shell includes body face plate and connecting screws, and the working parts are composed of three jaws, an engaging ring and an actuating screw, all inclosed within the body. The jaws are pivoted at their ends and rotate eccentrically, offering an unbroken tool bearing of their whole length, which affords entire

**THE LITTLE HERCULES DRILL CHUCK.**

immunity to the drill shank. The jaw faces are curved backward at such an angle from their axes and lever arm that the resistance of the work upon them produces a self-gripping of the jaws, which in turn reduces the work of the actuating screw nominally to that of a follower or holder. In using tools of the largest size of hold the tool is acted upon by the jaw very nearly opposite the pivot or fulcrum. This gives the longest possible leverage, and the greatest power upon the largest tools. The smaller the tool the nearer the contact comes to the joint of the jaw. The chuck thus becomes a self-poised tool, acting upon all sizes of tools with a relative power equal to the resistance offered, a point in which it is claimed this chuck is greatly superior to all others. The little Hercules is placed in the market only as a high grade tool, with perfect stock and workmanship, all its parts in duplicate.

**A New Theory of La Grippe.**

The unaccountable nature of the influenza commonly known as the grippe has invited the theories of all sorts and conditions of men, not to say of doctors, but among all no one is, perhaps, so well calculated to commend itself to confidence as that of Sir Morell Mackenzie, M.D., who in a paper in the June *Fortnightly* asserts that in his opinion "the riddle of influenza is poisoned nerves," and from this hypothesis "the bewildering diversity of symptoms becomes intelligible, if we regard them as the results of disordered nervous action." Dr. Mackenzie compares it to the extraordinary disturbance in telegraphic systems produced by a thunderstorm, and says this is nothing "compared with the freaks played by the living conductors in the human body, if anything throws the governing centers out of gear."

Now the theory of "poisoned nerves" is one that explains the almost infinite variety of attacks and curious freaks that mark the disease. No two persons, it is safe to say, have ever experienced precisely the same symptoms, and if it is a nervous disturbance, this is the natural result. Dr. Mackenzie regards the epidemic as falling under three general types, each of which include many varieties; these are the catarrhal, the digestive, and the nervous. "Influenza," he says, "is the very Proteus of diseases, a malady which assumes so many forms that it seems to be not one, but an epitome of all diseases, and its symptomology includes almost everything, from a cold in the head to inflammation of the brain. . . . It is really an acute specific fever, running a definite course like measles or scarlatina. . . . It is a disease with that superficial complexity of aspect which made Mrs. Carlyle playfully suggest that the doctors had agreed to call half a dozen different diseases by one name in order to simplify treatment."

Dr. Mackenzie adds that under all its disguises, he believes the disease to be perfectly simple; that the profound impression made on the nervous system by the poison explains nearly all the after effects of the malady, and especially that curious loss of vital energy which is so disproportionately great in comparison with the disease itself. The cause Dr. Mackenzie believes to be a living germ, air borne, but of what nature is not yet, he believes, established.

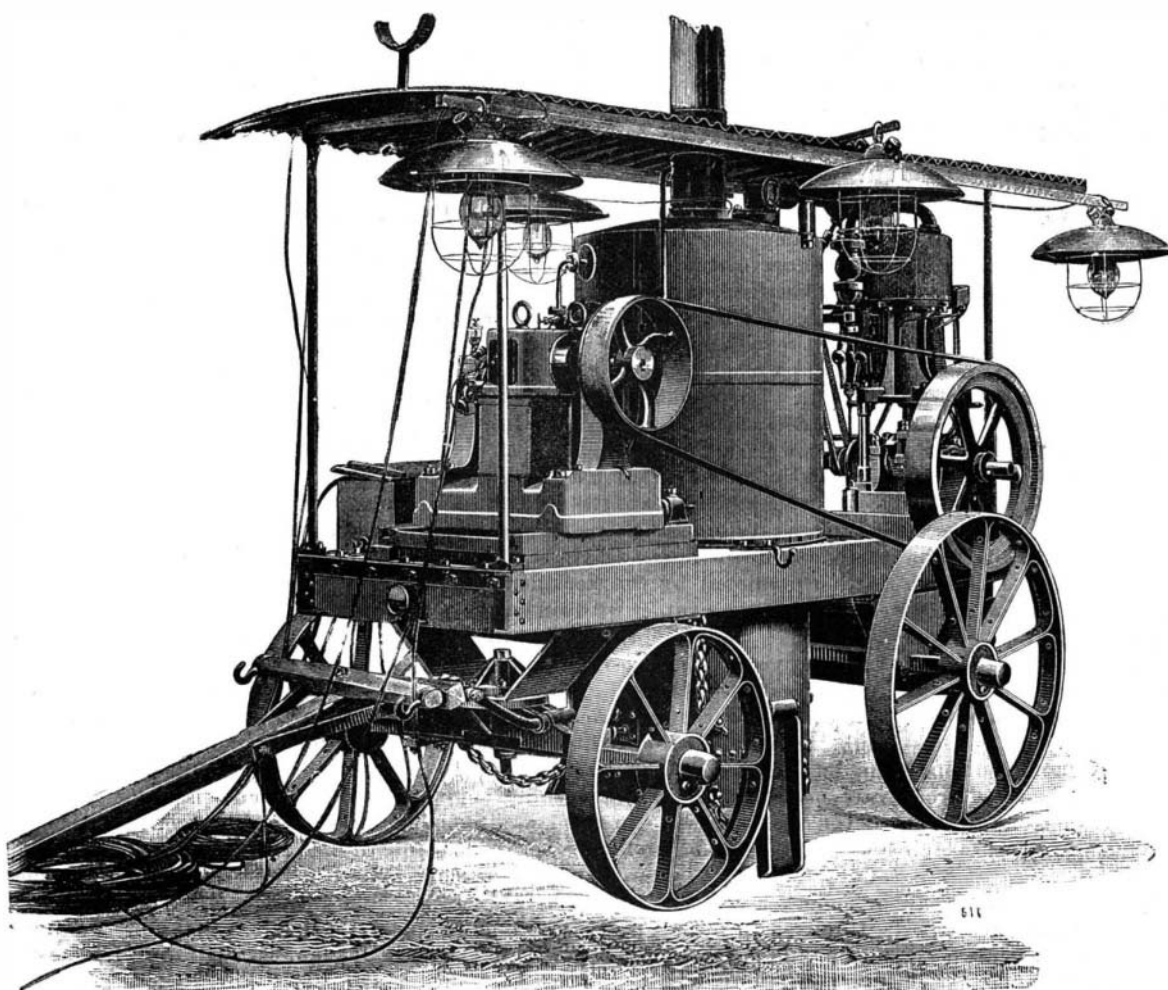
**Steamer Empress of China.**

The Empress of China, the last of the three vessels contracted for by the Canadian Pacific Railway with the Naval Construction and Armaments Company, Limited, of Barrow, went lately on trial from the Clyde to Conningberg, and thence to the Mersey. She is intended for the Pacific trade, and is an exact copy of both the preceding steamers. The trial was a complete success, some 600 horse power being developed over the sister ships. On the measured mile a speed of 19 knots was attained, while on the sea trial, in the face of a strong gale and heavy sea, the vessel ran 16½ knots, and this was considered by both builders and owners as very satisfactory. The following are the

dimensions of the steamer: Length over all, 485 feet; length between perpendiculars, 440 feet; beam moulded, 51 feet; depth, 36 feet; height from top of keel to upper deck beam, 39.10 feet. The gross tonnage is 5,920, and the total deadweight capacity, with a mean draught of 24½, is 4,000 tons. The vessel is divided into fifteen watertight compartments.

The Empress of China, as well as her two sister ships, all first class and highest speed, has been built to share in the large subsidy given by the British and Canadian governments to promote trade and maintain British naval supremacy.

To make skeleton leaves, soak in rain water for some weeks, remove by floating upon a card, and very gently remove upper skin with a soft camel's hair brush. Float in water and catch on a card with the other side uppermost, and remove other skin and pulp. A stiff brush may be needed, to be used by dabbing. Do not touch with finger. Finally wash well, bleach with javelle water, wash and dry.

**IMPROVED PORTABLE ELECTRIC LIGHTING PLANT.**