

PORTABLE SAND BLAST APPARATUS.

The uses of the sand blast for ornamenting glass, metals, stone, and other materials is well known. A new application of the process for cleaning down the walls of buildings has been introduced in England, which is described in a recent number of Engineering, to which we are indebted for our illustration. It has been used for cleaning the fronts of large public buildings, hotels, etc. Upon a truck is mounted an oil engine which drives an air compressor which fills an air reservoir to the desired degree of pressure. A flexible pipe conducts the air to the point desired, and blows the sand as required. Building fronts are thus cleaned in a very expeditious manner.

PROFESSOR E. ARMSTRONG in a recent lecture at the Royal Institution, on "The Chemical Constitution of the Sugars," said the Australians are a more sugar-headed people than any other people in the world. Messrs. Cross and Bevan exhibited in the library

some specimens of crystallized glycerine. One crystal of glycerine, about 1½ inches long, had a hole bored through it, by means of which it was suspended in some glycerine in a more fluid state than itself contained in a glass bottle.

THE SCOTTE STEAM CARRIAGE.

In the organization of the competition of automobile carriages held last year in Paris, the Petit Journal took the initiative. This journal has for a long time advocated the development of open air exercises. In our SUPPLEMENT, No. 979, we illustrated many of the automobile carriages which took part in the race. The steam carriage of M. Scotte, of Epernay, obtained a prize of 500 francs. In this vehicle, which is adapted for eight persons, the boiler is of the vertical type of the Field system and registered 120 pounds to the square inch. The two cylinder motor makes about 300 to 500 revolutions per minute and develops 5 horse power. The power is transmitted to the (rear) driving wheels through an endless chain and a differential gearing. The carriage is 15 feet in length, 6 in width, and weighs, when empty, 3,700 pounds. With 660 pounds of water, 440 pounds of coal, seven passengers and the engine driver the total weight reaches 5,940 pounds.

The carriage has the form of a brake, provided with a top and with curtains, for which windows may be

substituted, thus rendering it a closed omnibus. A rail on the top permits of the carrying of baggage. The consumption of water is from three to four gallons a mile on a level stretch and from sixteen to twenty in mountainous districts. The consumption of coal also varies from six to ten pounds, according to the road and the speed. The carriage did not answer the con-

ditions of the competition, as at Gaillon one of the Field tubes inside the vertical boiler burst and there was an explosion which caused some damage to the vehicle and slightly injured the driver. The judges, nevertheless, decided that the carriage of M. Scotte merited encouragement, so a prize was awarded to it. Without as yet realizing the dream of the tourist or the commercial traveler, the belief is now current in France

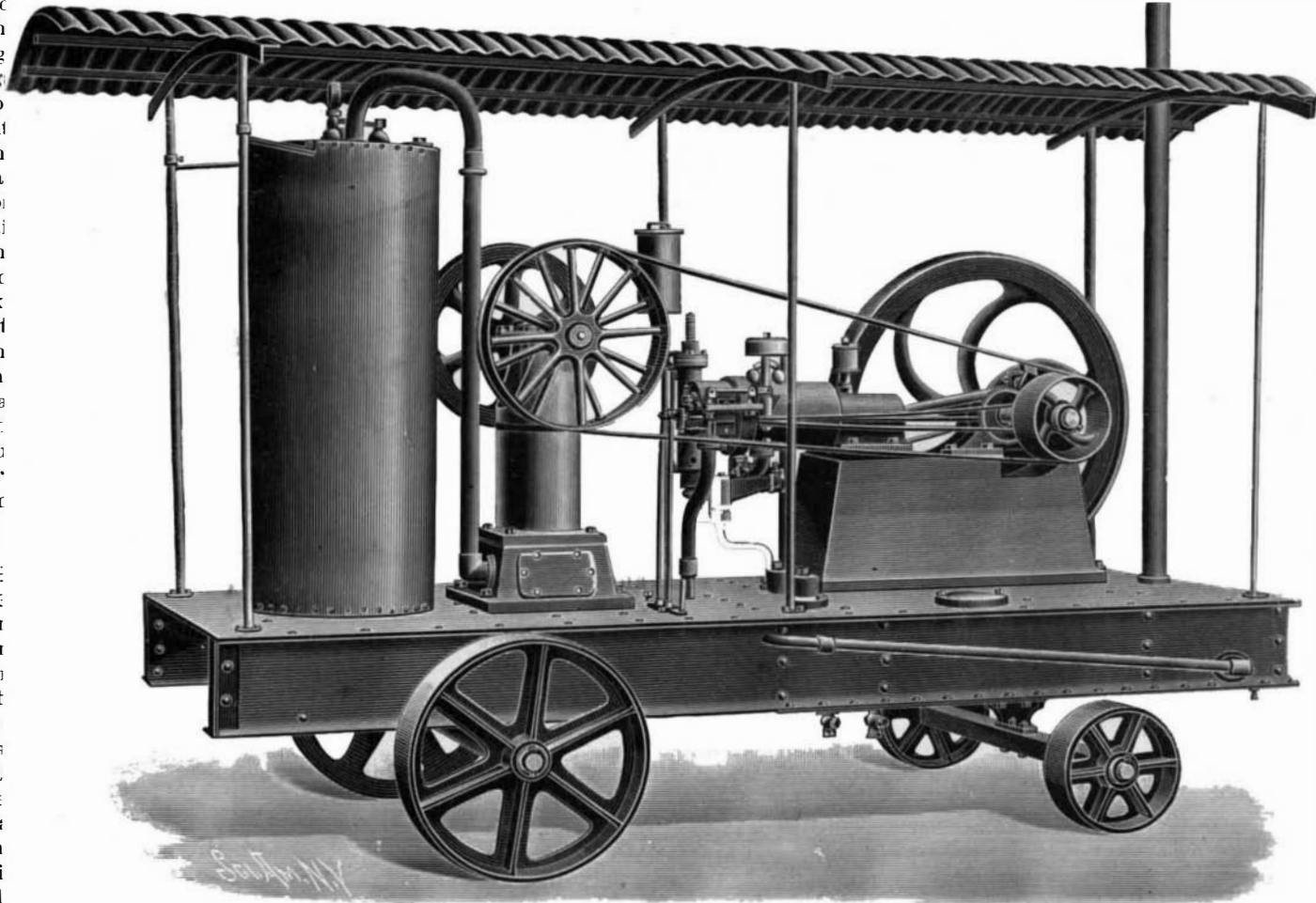
How to Mount Botanical Specimens.

The secret of obtaining fine specimens lies in drying them before decomposition has had time to take place, and applying as much weight as possible without injuring the more delicate portions of the plant. The specimens should remain in the press till all moisture is absorbed, which is, in most instances, about a week. In herbaceous specimens the entire plant is easily preserved. Bulbous roots may be managed with very little trouble by sectioning the root when too bulky. Succulent plants should be immersed in boiling water before being placed in the press. Each sheet should show specimens of both flower and fruit if possible. In the case of herbs, this can usually be done with one and the same specimen. When the seasons of flowering and fruiting are separated by some weeks, leaves should be preserved with each specimen, as the foliage often changes materially in appearance during that time. Where it is impossible to show the entire plant on a single sheet, the root and leaves

should be shown in connection with the branches. In drying, it is well to turn part of the leaves wrong side up, thus showing the appearance of both sides of the leaf; this is especially desirable in the fern family, if only one frond is shown. It is better to mount two or more leaves, and in that way give the different views. Never mount more than one species on a sheet; variations of the same species may be placed together, as the violet self-heal (*Prunella vulgaris*) with its freaks of bluish and white. For mounting, Linnæus used sheets of foolscap, but that size is now universally conceded to be too small for practical purposes. Most botanists prefer sheets 12 x 17 inches, and some use a double sheet. While this method protects the plant more, it adds to the bulk of the herbarium and to its cost, and on the whole it is questionable whether the advantage gained by the use of the double sheet balances that lost.—American Gardening.

Saturn's Rings.

Prof. James E. Keeler has made the interesting discovery that the ring of Saturn is made up of many small bodies, and that the satellites of the inner edge of the ring move more rapidly than those of the outer edge. The motion of the different parts of the ring, in miles per second, can only be given after the photographs have been accurately measured under a microscope. In a few days Prof. Keeler will give accurately the rate of speed at which the different parts of the ring revolve.



PORTABLE SAND BLAST APPARATUS



THE SCOTTE STEAM OMNIBUS

that the automobile carriage has come to stay. The mechanism is being improved and simplified, and we may soon hope to find them coming into more general use.

The chance of two finger-prints being alike is not 1 in 64,000,000,000.