

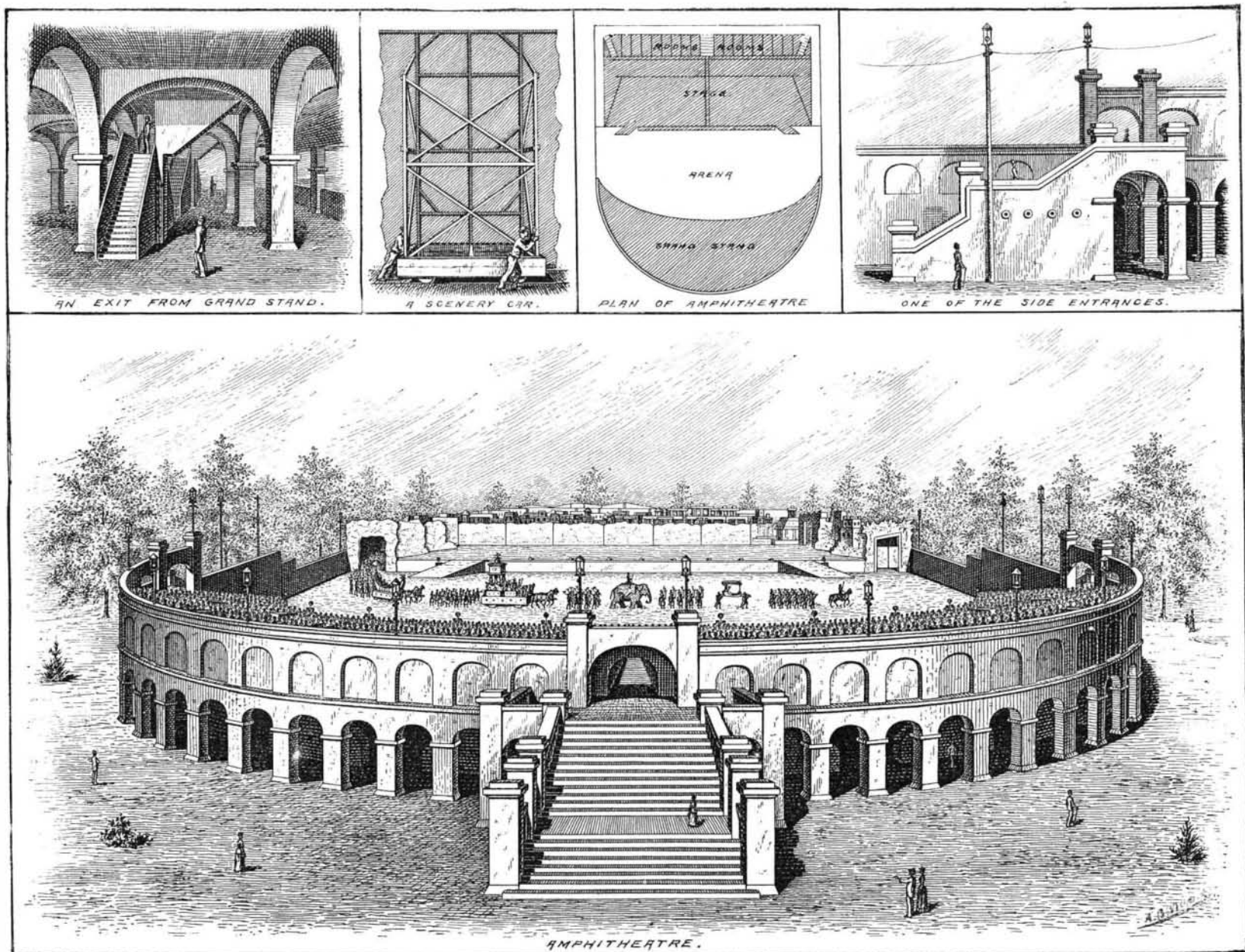
ROMAN AMPHITHEATER AT WEEHAWKEN, N. J.

This new amphitheater, situated on the heights of the west bank of the Hudson River, opposite the city of New York, is the first of its kind ever built in this country. The design is taken from the old style Roman amphitheater. The structure is 445 feet in length and 350 feet in width, and is divided into three sections, a grand stand, arena, and stage. The front, or main part of this structure, is built in a half circle, the rest of the inclosure being square. The half moon section, which contains the grand stand, is 30 feet in height, the walls being one foot in thickness above the lower arches, and 350 feet in diameter. The structure is of wood and covered with cement, which gives it the appearance of stone. The upper arches are inclosed, and there are 35 arches in each tier. The upper and lower arches are supported by square columns 3 feet in thickness, and these with 49 inner columns are the upright supports for the grand stand. They are made of 12 by 12 inch timber and boxed around to the required size. Curran's plaster slabs, made of wood fiber and plaster of Paris, are tacked on, and the whole column is then covered with 1½ inches of

of Thomson Cove crushed stone, making it a good ground to throw off water.

The stage is 140 feet in width and 330 feet in length. It stands 5 feet above the arena at the lower front portion, rising gradually up to 12 feet in height from the ground at the rear. From the gateway at each side of the stage there is a passage way 10 feet in width around and outside of the entire stage. To reach the top of the stage from the rear, three passage ways have been built, one on each side and one in the center. The side passages are about 8 feet in width and the center one is 20 feet. There are also twenty apartments built under the rear of the stage, each room being 30 feet in length and 12 feet in height. The separating partitions are sheets of corrugated iron, and the rooms are divided off equally among the performers, ten for the males and ten for the females. Adjoining the rooms is a corrugated iron hallway, about 4 feet in width, running on the inside the full length of the stage. The scenery is shifted about by means of cars running on 5½ foot tracks. These cars are 6 feet 9 inches in width and 8 feet 3 inches in length, and the car itself is about 3 feet in height and

engine, where we have simply to turn on the gas cock and rely upon the ingenuity and skill of those who manufacture the gas to make it of such quality as to give equally satisfactory results in the motor cylinder, whether used for a short or longer period. But when we come to the oil engine, we meet with a different state of things as regards supply of the working agent. The oil must be taken direct from its cistern, thoroughly mixed with the right proportion of air, and passed into the cylinder ready for ignition, at the rate, in some engines, of four separate charges per second, so that unless the arrangement for dealing with these heavy oils is correct and works with precision, the tendency to clog in the cylinder and working parts is very great. In fact, to use a homely example, the engine is like a strong-looking man with a poor constitution and suffering from pulmonary troubles; it will run well for a short time, and then, getting choked up, refuses to work. The sphere of usefulness of the oil engine is rapidly extending, because it is found reliable and steady at work, with decided economy of fuel. The only real objection that can be urged is the smell from oil, and this may be reduced by ventilation.



THE ROMAN STYLE AMPHITHEATER, WEEHAWKEN, N. J., OPPOSITE THE CITY OF NEW YORK.

cement and roughed up in imitation of stone. The arches are 14 feet in height, and the columns 7½ feet apart. A space of 60 feet in width running under the full width of the grand stand is fitted up with booths for those desiring to eat or drink.

Between the two rows of the center inner columns leading from the grand stand are thirteen exits, each 4 feet 6 inches in width. The front stairway to the grand stand is 25 ft. in width, and projects out from the main structure about 47 feet. The two side entrances are 8 ft. 6 inches in width and about the same height as the front entrance. The grand stand is 130 feet in width from front to rear, and its lower portion is 7 feet above the arena, rising thence gradually up to within 3 feet of the top of the amphitheater at the rear. It is built in thirty-five steps, each 8 inches in height and 2 feet 6 inches in width, and covered with painted canvas. The stand is fitted up with 5,000 polo chairs screwed down solidly to the flooring. There are also eighty private boxes. These, with the polo chairs, make the seating capacity about 6,000. Around the top of the amphitheater wall are electric lights, which, with numerous calcium lights, furnish light for the spectators to see the performance on the stage.

The arena is 165 feet in width and 350 feet in length. It is prepared ground, on which was first placed 3 inches of sugar house ashes, over which was spread 2 inches

made of heavy timber. Four upright pieces about 15 feet in height, of 2 by 4 timber, are fastened to the ends of the car and cross braced. The piece of scenery to be shifted is fastened to this framework to keep it in an upright position, and at the bottom the piece is fastened to the car by means of wrought iron straps. These straps are about 2 feet in length, 2 inches in width and ½ inch in thickness, and they are hook shaped at the bottom. The piece of scenery rests in this hook and is bolted to the side of the car.

The performers number about 1,000, with quite a number of animals, such as horses, donkeys, oxen, and an elephant. The costumes are taken from those supposed to have been used in the time of King Solomon. The amphitheater and fitting out of the grand stand with stage and scenery cost \$75,000.

Petroleum Engines.*

When considering oil engines, the fact should not be forgotten that we have an entirely different condition of things from steam or gas motors, because the engine has to gasify the oil for its own use. For instance, a steam engine that will run for a day with good results may be expected to run in a similar manner for a long period. The boiler is relied on to supply dry steam at the desired pressure. The same may be said of the gas

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What has undoubtedly to be arrived at in the construction of oil engines is to get economy of oil and the best mechanical results without clogging of the working parts, so that in the hands of the user the engine may run without attention or frequent cleaning and repairs. Clogging is prevented in some engines by thoroughly mixing the oil vapor with a large proportion of clean atmospheric air, so as always to form an explosive mixture, which gives complete combustion and a clean exhaust. It must be pointed out, however, that during the compression of the charge before ignition a portion of the vapor comes into contact with the walls of the cylinder, etc., and, condensing on them, never gets burned. This oil forms, in its heated state, a most excellent lubricant for the piston, thereby dispensing with the need of a more costly oil, and regulating the same without any attention. The perfect state of the piston surface after being months at work affords ample evidence of the advantage gained by this method of self-lubrication with a minimum of trouble.

The American Pomological Society, at its recent annual meeting in Washington, decided to make an exhibit classified by State and county associations, and also by individuals; and it appointed a World's Fair committee of six to confer with the Horticultural Department, and to perfect arrangements.