

which contain hot water at high pressure, mounted crosswise under the platforms. The end of one of these cylinders will be observed below. The front cylinder carries 80 gallons and the rear 50 gallons. At the station a set of small boilers is used specially for charging the reservoirs, and they supply water at a temperature of 190 deg. C., which corresponds to a pressure of 12 atmospheres.

The mechanism is all located at the exterior where it is easily accessible. It is protected by a set of hinged panels which can be raised and held by chains in order to clean and inspect the running parts. A motor is mounted on each side of the locomotive and these are divided off from the middle part by a vertical partition. One of the views shows the motor in detail. The movement is transmitted by the piston to the forward axle and from thence by a connecting rod to the two rear axles, as in a locomotive, the wheels being inside the vertical partition. The motors have a 6.4-inch cylinder and 11-inch stroke, with a slide-valve of the Walschaert pattern. The admission of air may be varied during 21 to 78 per cent of the stroke; in general it is regulated at 30 per cent. This is carried out by a lever moving over a sector at the right of the engineer. The exhaust from the motor cylinders escapes into a muffling chamber composed of four concentric tubes. In this way the steam is condensed and there is no noise or escape of steam from the locomotive. Although a number of valves are necessary to make connection between the different parts, in practice the maneuver is simple, and the engineer, after opening the valve of the storage cylinders and one of the hot-water tanks and regulating the cut-off of the motor, is only obliged to operate the hand-wheel of the regulator and the lever of the air-brake. The Arpaion line has at present five of these locomotives for the suburban trains. The total weight is 16.5 tons when empty, and when complete with the air and water supply it weighs 18 tons.

TROPICAL TREES IN CALIFORNIA.

By CHARLES F. HOLDER.

ONE of the charms of Southern California to the visitor, especially in winter, is the profusion of seemingly tropical verdure which everywhere greets the eye; yet Southern California is by no means a tropical country. The mercury stands at 2 or 3 deg. below freezing several nights every winter, and ice is often seen in the morning in certain localities; but the moment the sun is out semi-tropic conditions prevail again, and strange to relate, little or no damage is done by the cold.

In all the cities and towns of the State the palms particularly attract attention, and their size indicates that Southern California has not had in a century sufficient cold to injure them, and that they will readily withstand a temperature of 26 deg. Pasadena, perhaps, gives the most pleasing impression of tropical conditions, many of its streets being lined with palms, and the gardens filled with numerous varieties of these trees. The most familiar form is the fan palm *Washingtonia*, shown in the accompanying photographs. When large they are stately and beautiful trees, and Pasadena, 50 years from to-day, will be well supplied with them. They are slow growers, averaging a foot a year under very favorable conditions, but when deprived of water they grow slowly. In the city mentioned there are a number of palms 30 or 40 feet in height; and at the old mission of San Gabriel some magnificent specimens are seen. Fig. 1 shows the effect of young palms in a street in Pasadena, these being about 18 or 20 years old. Larger palms on the ranch of Mr. J. Bakewell Phillips, on Magnolia Drive, are shown in Fig. 2. In the latter instance the trees have not been trimmed, the leaves being allowed to droop, almost covering the trunk. These palms are perhaps 30 years old and have had an abundance of

the desert, and in summer one of the hottest places in the United States. To the east is the great depression, nearly 300 feet below sea-level, and beyond the great Californian desert.

The *Phoenix canariensis*, or date palm, in its several species, is very common in Southern California; its graceful leaves and ponderous trunk being seen in almost every dooryard or garden, while the Alexandra palm, *Erythea*, *Areca*, and many more flourish and add to the tropical appearance of the country.

THE MOSQUITO PLANT.

An interesting controversy has been going on in the columns of the London Times over the supposed

at the suggestion of the Hindu manager, the whole boundary of the gardens was planted with "holy basil" and any other basils which were at hand, with the result that the plague of mosquitos was at once abated and the malarial fever disappeared from the gardeners and others at work on the grounds.

Capt. Larymore took with him to England a growing specimen of the plant, which he gave to the authorities at Kew Gardens, the great botanical establishment near London. The officials there were much interested in the captain's statements, but they are now convinced that there was no foundation for them. The director of Kew Gardens, Sir William Thiselton-Dyer, wrote to the London Times on July 24, inclosing a report made to the governor of Sierra Leone by Dr. Prout, the principal medical officer of the colony. Dr. Prout gave



FIG. 2.—PALMS ON MAGNOLIA DRIVE.

virtues of the "mosquito plant," the name given to a variety of basil, the *Ocimum viride*.

Last April Capt. Larymore, the British resident in Northern Nigeria, published a letter in which he asserted that by placing two or three pots of "mosquito plant" in each room of a house, and others along the windward side of the veranda, the place could be kept practically free from mosquitos. He described an experiment he had made, which showed that a mosquito inclosed within a leaf of the plant became stupefied, and he added that an infusion of the leaves of the plant was held by the natives of Northern Nigeria to be more efficacious than quinine as a remedy for malarial fever. Capt. Larymore suggested that the plant should be used in barracks in India.

lengthy details of experiments with a dozen mosquitos and the "mosquito plant."

These experiments failed utterly to show that the plant had any effect in driving away the insects. Sir William Thiselton-Dyer, in his introductory letter, made some rather sarcastic observations on "easy empirical" remedies, and the London Times was apparently convinced that Capt. Larymore and Sir George Birdwood were mistaken in their assertions, for it printed a leading article in which it declared that the "mosquito plant" has been shown to be "utterly useless."

Since then both Capt. Larymore and Sir George Birdwood have written to the Times declining to withdraw their statements as to the efficacy of the basil. Both pointed out that experiments with single pots of the plant and a few mosquitos could not be regarded as conclusive, and Sir George Birdwood said the real question was the weight of Capt. Larymore's practical experience against Dr. Prout's experiments. In a letter dated August 2, Capt. Larymore said:

"I think it unfortunate that the superficial experiments with a dozen mosquitos, which were conducted in Sierra Leone, should have been accepted as conclusive evidence that the plant in question does not possess the properties ascribed to it.

"1. The plants employed may possibly not have been the same *ocimum* used and referred to by me.

"2. They may not have recovered after transplanting—mine were three to four months regaining their full foliage.

"3. The well-known powerful smell of ripe bananas may have negated the scent of the plant in so small a space as the mosquito net cages mentioned.

"Natives from time immemorial have held that the plant does possess the properties I have ascribed to it, and the original cause of its becoming sacred in India, where it is still worshiped, was doubtless due to this fact.

"I must again repeat that the particular *ocimum* given me by the natives in Northern Nigeria does possess the power of driving away mosquitos, especially a healthy plant with its leaves bruised. My wife, who was with me, invariably used the leaves at night under open-worked stockings to protect her ankles, and at dinner the complete immunity enjoyed by her was very obvious indeed. In any case, I shall always make a point of having a hedge of the plant, if possible, in every garden I own in the tropics, and can only recommend those who are anxious and willing to add to (not necessarily take from) the security of mosquito netting and quinine, to do likewise."

Increased Emigration from Italy to the United States.—The disastrous effects of the failure of the cocoon crop of Piedmont, together with the further bad effects of the frosts and prolonged rains on the wheat, grape, and other crops of the province, have been exceedingly discouraging to the peasants, and the prediction is made that the coming year will witness a great increase, from this portion of Italy, in the emigration to the United States.—Pietro Cuneo, Consul at Turin.



FIG. 1.—STREET IN PASADENA, CALIFORNIA.

water. In Los Angeles, San Diego, Santa Barbara, and especially San Fernando, there are lofty examples of this beautiful, indeed majestic, tree. This palm is particularly interesting from the fact that it is indigenous to California, being found in a range of mountains facing the famous Salton Sea. How the palms came in this locality no one knows, but they are growing in several cañons which reach down to

Sir George Birdwood, the well-known naturalist, wrote a day or two afterward that allied basil plants had been known from time immemorial as a defense against mosquitos and as a prophylactic in malarial districts throughout India. He related how, when the Victoria Gardens were being constructed in Bombay, the men employed in the work were so pestered by mosquitos and suffered so greatly from malaria that,