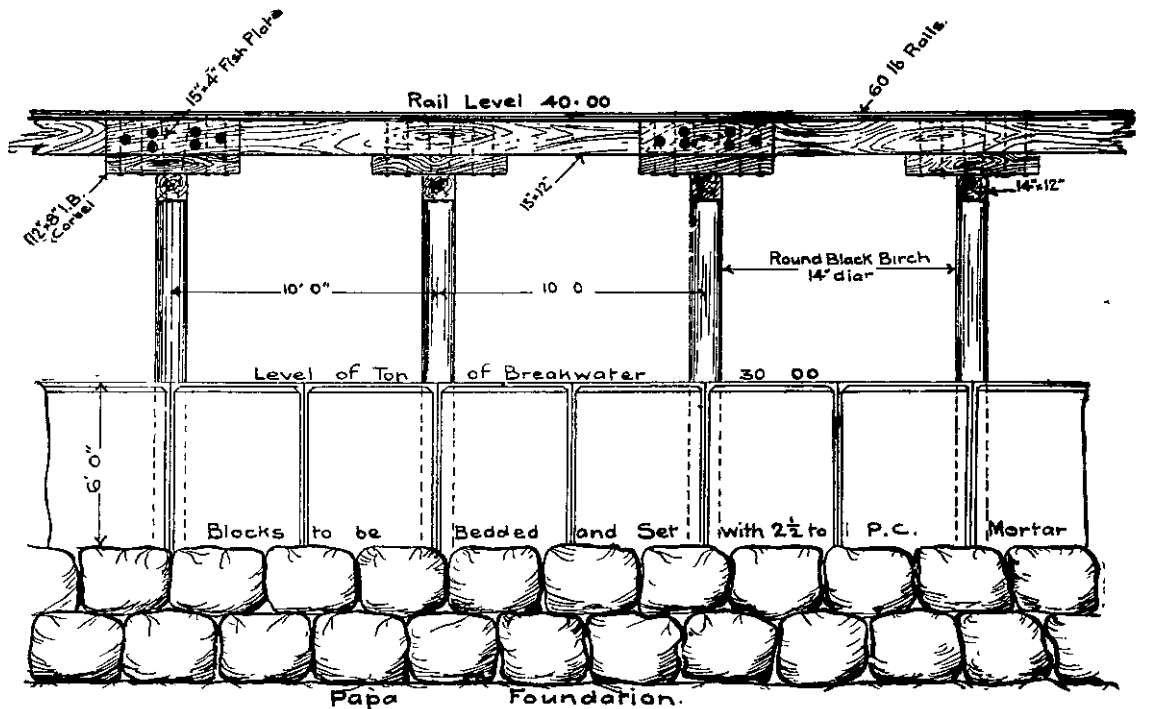


of Messrs. Barr & Oliver the training walls extending from the town to Landguard bluff, were constructed to half-tide level, with the result that the depth between the walls that was previously from 2½ to 3 ft., was, through the walls, aided by a little dredging, increased to 5 ft. at low-water spring tides. The dredge during heavy flood broke from her moorings, and after being carried over the bar was stranded on the beach some miles to the northward. After Messrs. Barr & Oliver the charge of the harbour was entrusted to Mr. Lloyd Hassell, who was appointed resident engineer—a position he resigned in 1885. In the beginning of 1894 Mr. Leslie H. Reynolds was called in to advise upon the deepening of the channel up to town; and in the end of the same year he was appointed to formulate a scheme for the improvement of the entrance and the harbour generally. In 1899 Mr. Napier Bell was engaged to report, but until last year nothing further was done, when the Board adopted Mr. Reynolds' recommendations and instructed him to prepare the detail drawings necessary to execute the work. Mr. Reynolds' scheme comprised north-east and south-west moles at the entrance, as shown upon plan, together with a training wall within the estuary for the protection of the south spit against the tendency of the river to break through during floods, and also for the purpose of training the outgoing waters with the object of obtaining a better sweep through the narrows at Castlecliff. In conjunction with this he advised systematic dredging of the channel through the flats up to town, and in addition outlined a future floating basin for the accommodation of deep-draught vessels. Mr. Reynolds estimated that were the moles extended seaward a little beyond the three-fathom contour line the depth maintained by scour would be equal to 28 ft.



LONGITUDINAL SECTION OF PATEA BREAKWATER.

training and protective wall to the south spit. This consists of fascine crib work to within a foot or two of low-water level, and from that to 3 ft. above high water of ironbark piling and planking. The fascine crib work will be filled in with heavy shingle and other spoil delivered from the dredge, the whole being protected by a layer of rubble obtained from the Shell Rock quarries some 16 miles up the river.

In concluding our article it should be stated that the Patea scheme, although a small one, has given complete satisfaction to the owners of vessels trading to the port, and that the work at Wanganui is certainly destined to provide that prosperous centre with a harbour capable of allowing vessels of considerable draught to enter or leave without risk.

Motor Car for Babies.

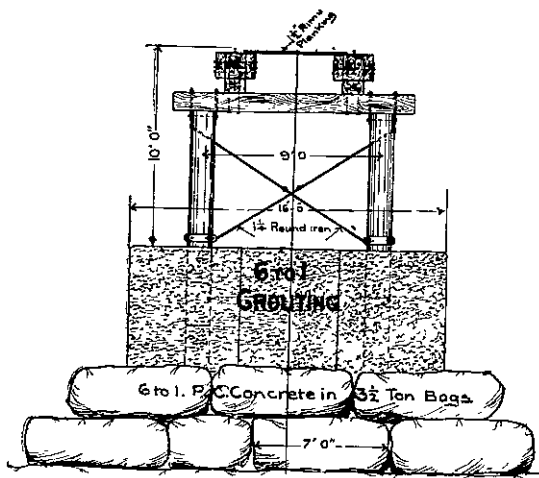
Every baby now can have his or her own motor car; a new era in perambulators has begun, and Mr. Dunkley, of Birmingham, one of the leading manufacturers of perambulators in England, has invented a little vehicle which he calls the pramotor.

It consists of a comfortably upholstered bassinet with a folding hood and pneumatic tyres, worked by a little electric motor of less than a ¼ h.p. and capable of attaining any speed up to five miles an hour.

The nurse can either walk behind if she wishes exercise, or sit on a bicycle seat which can be drawn out by means of collapsible tubes from under the

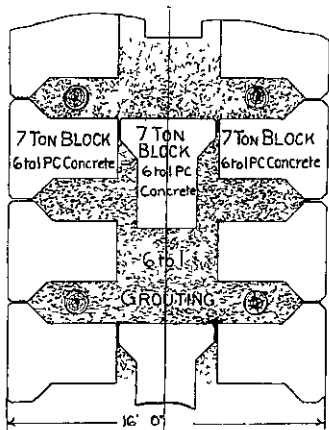
car. The driving-lever and steering-wheel are fixed at the back of the car well out of reach of the erratic occupant. The charge is guaranteed to last for five hours.

AUTOGENOUS SOLDERING.—Many of the defects of soldering are due to the employment in the solder of some metal different to that or those which have to be united. Uniting metal by means of a "solder" of the same composition has, however, been in use for many years. It is known to the workman as "burning," to the engineer as "autogenous soldering." Hitherto it has been practically limited to lead. It is believed to be occasionally employed in high-class plumbing work, but it is most commonly seen in factories where sulphuric acid is made. In lead burning a stick of "solder," which is pure lead, is caused to melt by the heat of a blow-pipe, usually consuming hydrogen and air. The process is somewhat expensive, because the hydrogen has to be generated from zinc and acid on the spot, while a boy is needed to work the air pump. Coal gas and air do not give a sufficiently hot flame to melt the lead stick. With acetylene, however, it is claimed that a temperature is obtained exceeding that of the hydrogen air, oxy-coal gas, or even oxy-hydrogen blow-pipes—, in fact, a temperature but little short of that of an electric furnace. Therefore, by means of the oxy-acetylene blow-pipe, not only lead, but also iron or steel, and probably copper, can now be "burned." Chemically speaking, the joints are permanent, because, if made with due skill, there is no "joint"—the two pieces are made one, just as in welding, but without the blows.



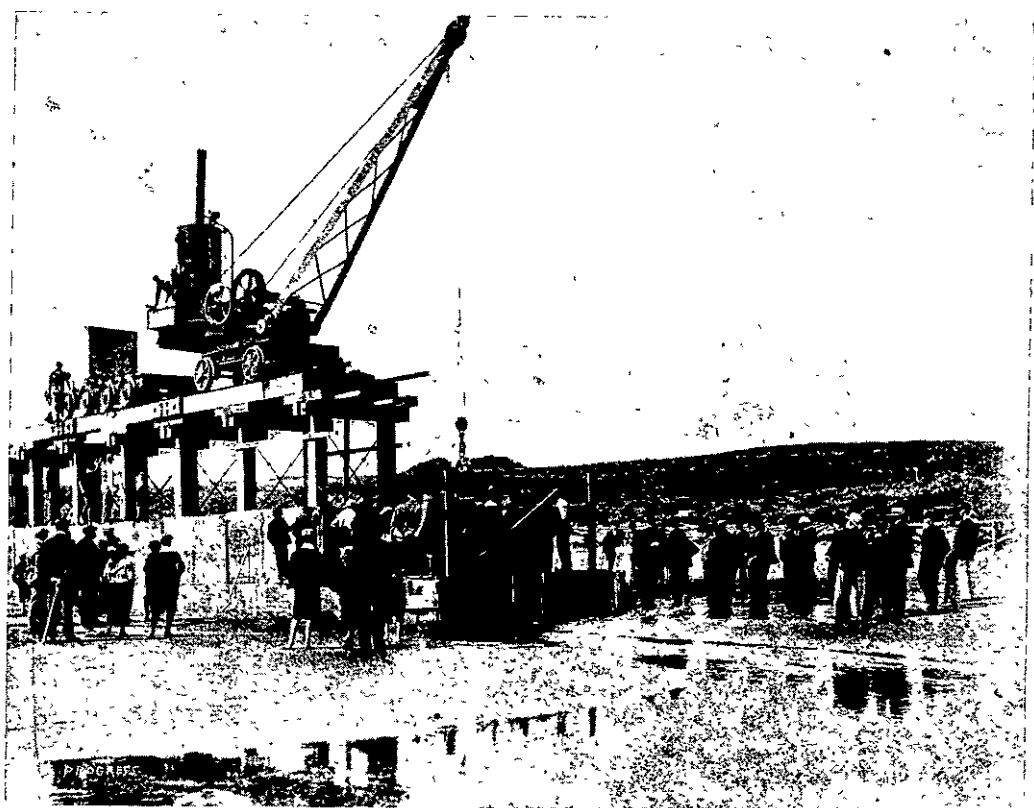
CROSS SECTION OF PATEA BREAKWATER.

at high-water spring tides. As the funds of the Board would not admit of the whole of the works referred to being undertaken, it was decided to proceed as far as possible out of revenue during the present year, after which it is proposed to borrow £30,000 and construct portions of both moles at the entrance. The works, now being undertaken under Mr. Reynolds' supervision, comprise the construction of the training and protective wall to the south spit, together with the dredging of the channel through the flats to give a depth of 9 ft. at low-water spring tides, which will be equal to about 16 ft. at high water. For this



SECTIONAL PLAN OF PATEA BREAKWATER.

purpose the Board purchased a gold dredge, to which was added a centrifugal pump, to discharge the finer material over the southern training wall, the heavier material being delivered into hopper barges and utilised for the construction of the training wall at the south spit. The addition of the centrifugal pump was left to Mr. Edward Roberts, of Dunedin. The hopper barges, plant and material necessary for the work have just been completed, and a commencement made to the



THE EARLIER STAGES OF THE WORK AT PATEA: SETTING THE MONOLITHS IN POSITION.