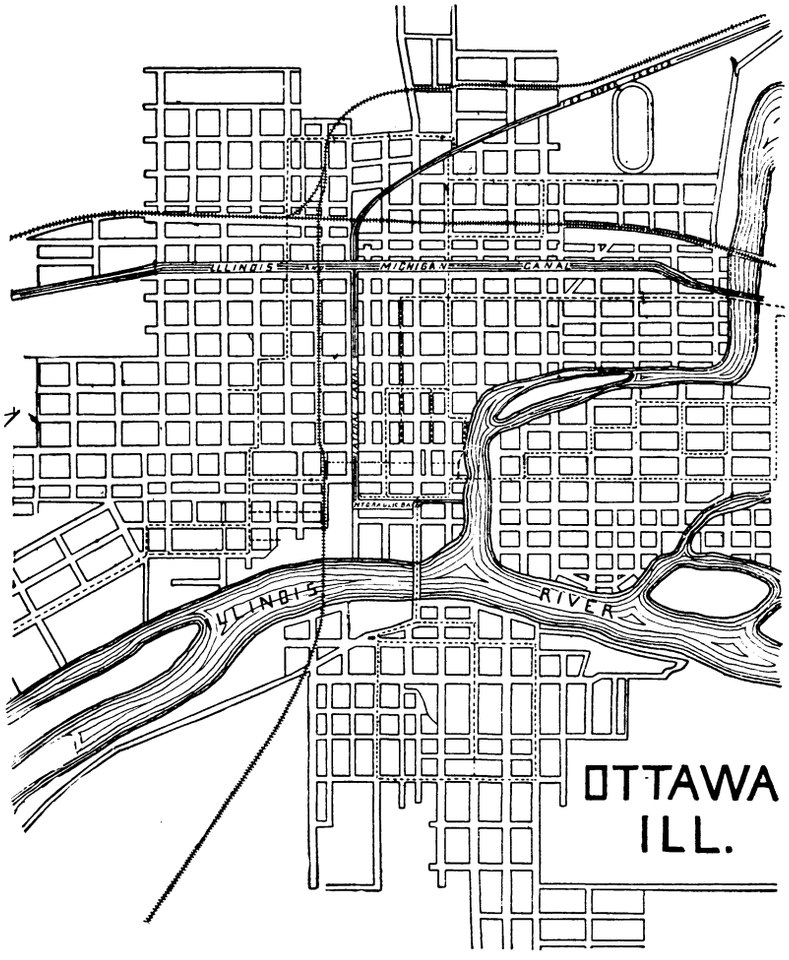
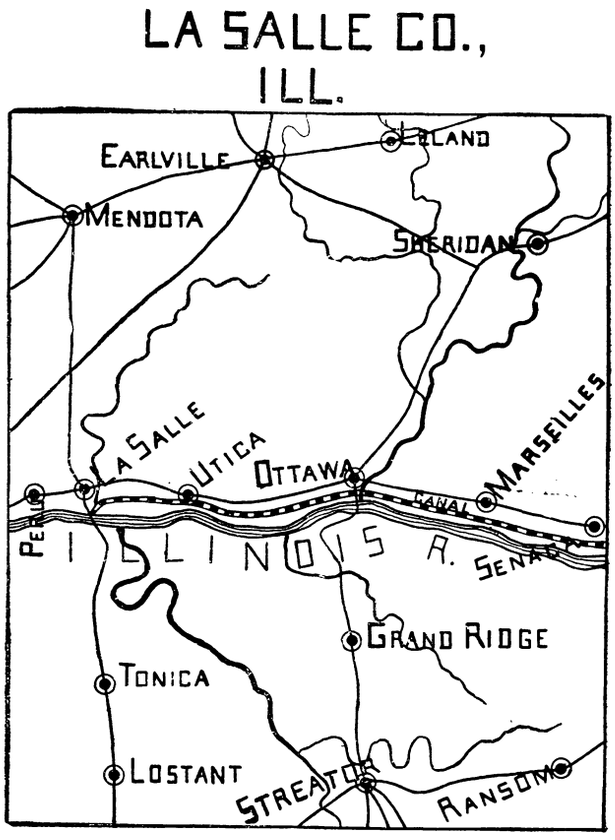
miles distant in the opposite direction from Ottawa. The capacity of the original apparatus is now almost fully taken up, and enlargements are necessary.

From the accompanying engravings an excellent idea may be secured of the peculiar features of the plant mentioned. The outline map of La Salle County (Fig. 3) shows the relative location of the cities of Ottawa, Marseilles, and Seneca, also the Illinois River, and the Illinois and Michigan Canal. It will be seen that the lighting done by this plant extends for a distance of thirteen miles along the Illinois River, from the centre to the border of La Salle County. Fig. 2 is an outline map of the city of Ottawa. The incandescent circuits are indicated by dotted lines, and can be seen entering the city from the east, on the right of the engraving. This circuit is constructed throughout of No. 8 wire, hard drawn and weather-proof. Fig. 4 is a view of the company's buildings.





FIGS. 2 AND 3.—MAPS OF OTTAWA, ILL., AND OF LA SALLE COUNTY, ILL.

The large building with the cupola, in the foreground, contains the water-wheels, and the small building to the left is the dynamo-room. This engraving also shows the flume as it enters the building, and the circuits leaving the station. Fig. 1 is an inside view of the dynamo-room, showing the machines in position, together with the shafting, pulleys, and belting by which the dynamos are driven. The engraving also shows the method of connection between the dynamo and automatic regulator. On the whole, this station may be ranked as being highly typical of modern progress in incandescent electric-lighting.

CONDENSED FRUITS AND VEGETABLES.

THE introduction of preserved or condensed foods, both of animal and vegetable origin, in hermetically sealed tins, has developed to an enormous extent of late years. One of the most successful of the recent introductions is undoubtedly the pine-apples that are imported from Singapore. Many persons who have an objection to tinned foods generally, have pronounced these to be of excellent quality and flavor, and though they are to be obtained almost at any grocer's, and at a very cheap rate, they are not in such great demand as might be expected. The prejudice against new products or preparations is difficult to overcome, and this prejudice is more general even among the poorer and working classes than among those better informed. There is a general belief among them, says the *Journal of the Society of Arts*, London, that only the commoner qualities of food-products are put up into tins, and consequently they reject them. The success of the pine-apple, however, treated thus, ought to dispel that notion, and to lead to other fruits, especially those of tropical countries, to be similarly treated for export purposes. There seems to be no reason why mangoes, guavas, rose-apples, and a host of others, should not become regular articles of import and consumption, and even perhaps some of the other vegetable productions of distant lands. That the ordinary English vegetables and fruits can be preserved for winter use when the fresh ones are not obtainable has been proved over and over again.

The preservation of vegetables and herbs by desiccation by the natural action of the sun has been known to and practised by agriculturists from time immemorial. Within historical times it has been supplemented and improved upon by the introduction of drying in kilns. Both the ancient Chinese and Egyptians used this method in remote ages. The vegetable substances offered great difficulty for stowage and transport in consequence of their bulk, and the imperfect nature of their preservation. This difficulty was very successfully overcome in 1846 by a Mr. Masson, who was head gardener to Louis Philippe, King of the French, and who invented a process by which kiln-dried vegetables, herbs, and fruits can be compressed by powerful hydraulic pressure, re-

taining their hygienic properties for a length of time. By this process a quantity of vegetables sufficient for a mess of forty thousand persons was reduced to the volume of one cubic metre, thus effecting an enormous saving in stowage and in transport.

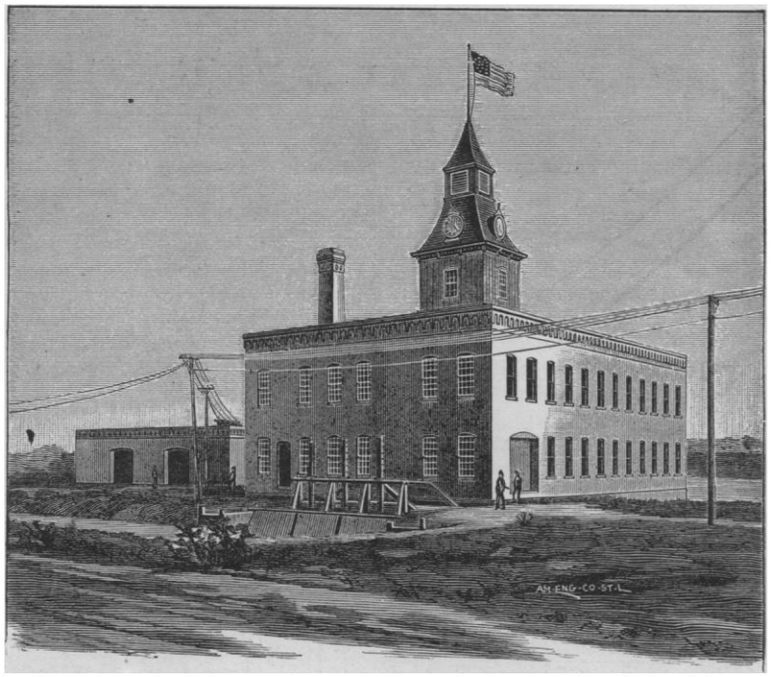


FIG. 4. — HEISLER COMPANY'S BUILDINGS AT MARSEILLES, ILL.

Later on, the invention was patented by Messrs. Chollett & Co. of Paris and London, who introduced improvements, and have ultimately brought the process to its present state of perfection; so that their successors, Messrs. C. Prevet & Co., prepare enormous quantities of dried and compressed vegetables and fruits for the supply of the British army and navy, the Board of Trade making it compulsory that every outgoing vessel is supplied with a certain quantity.

At the time of the Crimean war these prepared vegetables were very largely used, and were mixed, dried, and compressed under certain rules laid down by an international Anglo-French military and naval medical commission, to which the celebrated Alexis Soyer, who was chief inspector of army cookery to the campaign, gave practical assistance. For the mixed vegetables, the following proportions were decided upon, and are still adhered to: potato, 40 per cent; carrot, 30; cabbage, 10; turnip, 10; seasoning herbs (onion, leek, celery, parsley, parsnip, etc.), 10.

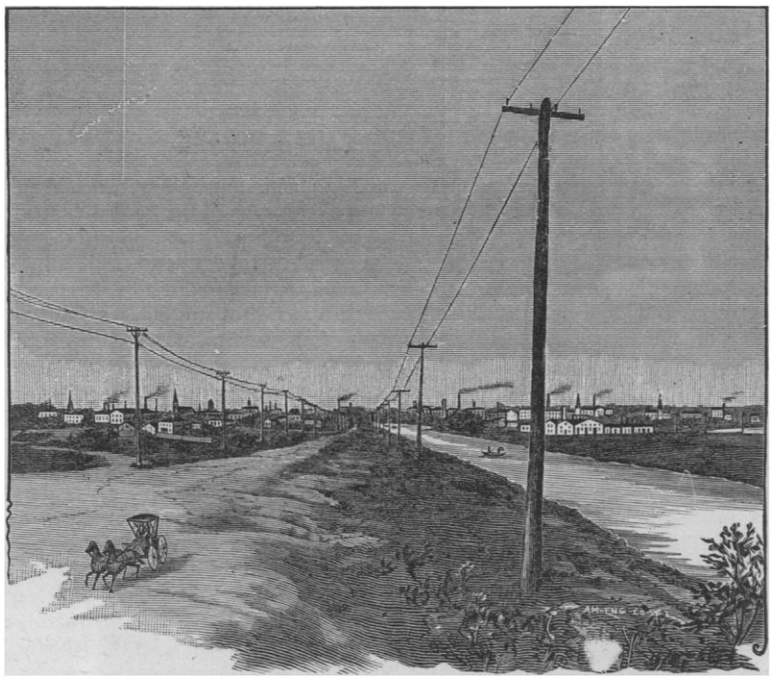


FIG. 5. — HEISLER COMPANY'S POLE LINE.

The vegetables are gathered in the autumn, when they are in their prime, and carefully sorted, then cleaned, washed, peeled, sliced, and slightly steamed (fixing the saccharine and albuminous parts, preventing to a great extent the volatilization of the essential oils, and thus preserving their hygienic and antiscorbutic proper-

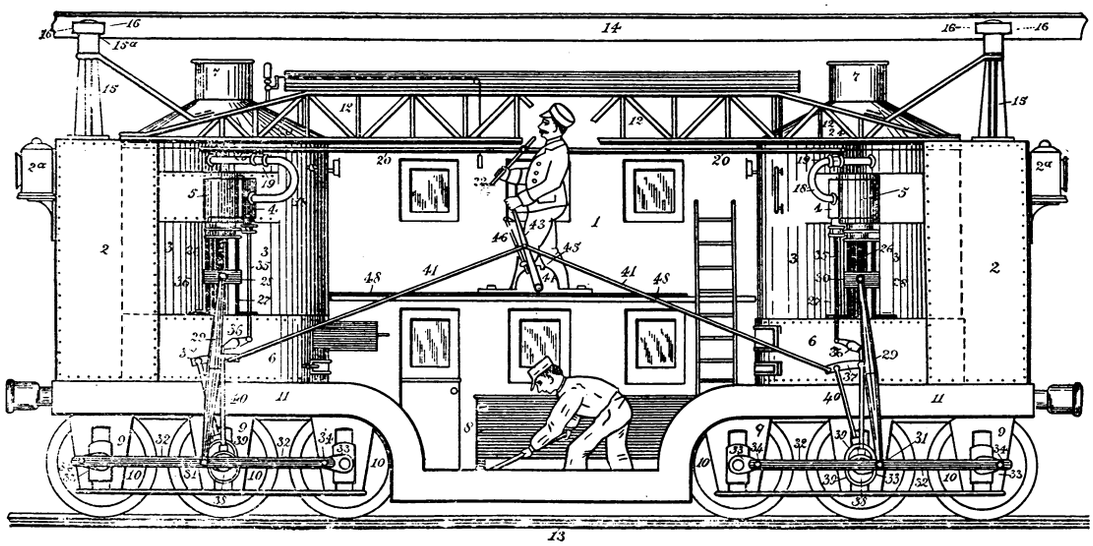
ties). The various manipulations were formerly performed by hand, but all are now done by machinery. The vegetables thus prepared are then dried in kilns and on lattice work trays by currents of moderately hot, dry air, thereby retaining their natural color, flavor, and aroma. This stage of the process requires the greatest care and attention, so as to keep the temperature constantly at the level ascertained by experience to be necessary for each kind of vegetable. The vegetables and herbs are then carefully mixed in the proportions given above, and then compressed to one-eighth of their original bulk (when fresh) by powerful hydraulic pressure into moulds, thus forming square slabs about three-quarters of an inch thick, grooved so as to be divided into cakes of five rations each, at the rate of one ounce per ration, easily separated for convenience of issue. These slabs are then wrapped in paper, and packed by machinery into square tins, which are hermetically soldered. Before the lid is soldered down, a punch stamps it automatically from the inside with the season of manufacture. When two years appear on this stamp, as "1888–89," the first is the year of the crop, and the second the year of compression. The tins are now made of bright "coke" tin-plate of the best quality, it having been found by experience that the vegetables keep much better in this material than in the dull terne-plate formerly used.

The vegetables and herbs are also prepared separately, as there is a greater demand in some quarters for some kinds than for others: as, for instance, in South Africa, for compressed celery as a cure, when stewed, for rheumatism caused by sleeping on the open veldt; in India, for compressed onions, to make a soup considered a sovereign remedy for the effects of over-indulgence in spirituous liquors; in the Hudson Bay territory, for the same article as a generator of warmth in the stomach; and in Burmah, for compressed apples and pears, which are prepared in a similar manner to the vegetables and herbs. All these vegetables, herbs, and fruits are also obtainable in their dried and desiccated condition, without being compressed into cakes. In either state they are extremely convenient, portable, and useful, as are also the prepared and condensed soups and flours made from potato, pea, lentil, haricot bean, carrot, chestnut, etc. They are, moreover, wholesome; and the use of these vegetables, fruits, etc., will probably become more widely extended.

The Engineering and Building Record appeared in a colored cover last week, and is enlarged by the four pages which the cover made. The improvement has been under consideration for a considerable time, and, as the current volume closes with the last issue for November, it seemed best to make it now. The getting of a cover which should at once be distinctive in color and meet all the other requirements was no easy task, and the reader is left to judge of the result finally reached.

THE BOYNTON BICYCLE RAILROAD.

In last week's issue we briefly described the Boynton Bicycle Railroad at Gravesend, between Bay Ridge and Coney Island, a few miles from this city. The novelty of the Boynton system, and its vast possibilities in the line of high speed combined with safety, which rest on the fact of its running, like the bicycle, on one rail, justify us in giving our readers some further particulars concerning it. Among the advantages inherent in this system (in which the train is like a wide plank on edge), the development of which is only a question of the proper adaptation of means to ends, are the following, as given by a competent and disinterested authority on engineering: 1. A great increase in smoothness of motion at high speeds, permitting an almost indefinite increase of speed without danger in this respect; 2. A diminished air resistance, due to the narrower vehicles and running-gear; 3. A narrower road-bed, less costly to construct and to maintain. To these may be added the much greater ease, smoothness, and safety in rounding curves at high speed, as well as the excellent facilities for electrical propulsion afforded by the guard-rail overhead. Another advantage, the great flexibility of the system, must not be neglected. It is as well adapted to the slower and heavier freight traffic as to the light and rapid passenger service; to the high speed



FREIGHT LOCOMOTIVE FOR THE BOYNTON BICYCLE RAILWAY.

and frequent stoppages of city and suburban rapid-transit trains as to the long runs of the limited express on trunk-lines; to electrical as to steam propulsion; and to elevated or underground as to surface roads. Its development in all these directions must follow as a necessary consequence to its successful introduction in any one of them. For this reason the progress made in perfecting the details of the system, at the Gravesend road and elsewhere, will be watched with unusual interest by the intelligent people of every country in which railroads have been introduced.

The section of road at Gravesend upon which the Boynton system is used had long been abandoned by the company formerly operating it, as they had secured a more direct route with fewer heavy grades. It was in poor condition, owing to the decay consequent on long disuse; but as in some respects at least (such, for instance, as high grades and several sharp curves) it was well adapted for showing the merits of this system, it was secured by the Boynton Company. They equipped it with an overhead guard-rail, and are getting the road-bed and track into good repair as speedily as possible, so that they will soon be able to double the speed of the trains without danger of accident from defective ties, etc. Even in its present state, with the train-speed limited by unfavorable conditions to a fraction of that possible under more favorable circumstances, this short railroad is attracting a great deal of attention, not only from railroad men, but also from men eminent in engineering, electrical, and scientific circles generally.

On Saturday of last week a representative of this paper was