How to Improve Roads.

Henry County, O., has been well nigh ruined by mud. With lethargy born of a sense of despairing helplessness, the people have submitted to their heavy burdens. Year after year the mud blockade has almost stopped the wheels of business for periods of weeks at a time, amounting in all to nearly one-fourth of the year. Everybody prays for good roads, but nobody puts his shoulder to the wheel. Our roads can be very materially improved at an expense entirely within the means of even this tax-burdened people. By all means let us have stone roads as soon as possible; but first let us prepare a place to put the stone, to insure us against the chance of losing it in mud unfathomable. For the sake of illustrating, let us suppose that we are going to make an entirely new road. After the road is located we will stake out the track, which should not be more than 20 feet wide. After this is done, let a competent and trustworthy civil engineer stake out two lines for tile drain, each a few feet from the center line of the roadbed. Then tiles should be laid to a perfect grade, not less than an average depth of three feet, and carried to the nearest outlet, no matter what the distance nor what the expense. This is an absolute necessity, as without efficient tile drainage there can be no good road built in Henry County, either of stone, gravel, or any other material that is accessible. After the tiles are laid as above directed, proceed to raise the roadbed about 15 inches in the center and 8 or 9 at the outside, by scraping upon it the surface soil. No clay should be allowed on the road. It should then be made perfectly even and smooth. No hillocks or hollows should be allowed under any circumstances. It will then be a good plan to go over it several times with the heaviest rollers and make it as compact as possible. Then dig your side ditches with the same care as to grade and outlet as was done with the tiles. These open ditches need not be deep, but should be so graded that no water will stand in them to soak and soften the bed of the road. They will carry off the water that falls upon the road, while the tiles will carry that which comes up from below.

In order to keep this road in good condition, appoint a man to go over it every day in the wet season, and draw off the water from puddles that may form on the bed of the road and fill them up, and also to keep the side ditches in good working order. The road should be completed as early as the middle of August, so that it may be well settled before the fall rains set in. Let the above principles apply to old roads. The roadbed need not be raised more than two feet above the general level, unless in crossing a low place.

After you have constructed your road in the above manner, you have a foundation upon which you may build your stone or gravel road, which you may delay doing until you feel able to bear the expense. When you wish to put stone on the road, make it twelve inches thick at the center and six or eight at the side; the width should be from twelve to fifteen feet. This done, you have a road that will be a pleasure to travel on at any time of the year. Farmers can then sell their produce when the price is most satisfactory.

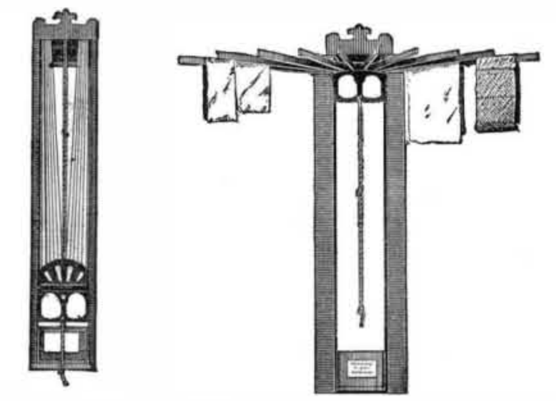
There are three prime essentials to road building in this locality. They are: first, drainage; second, better drainage; and third, the best drainage possible.—*T. C. H., in Napoleon, Ohio, Signal.*

Protection of Vineyards from Frost.

The damage which may be done in vineyards by frosts in spring is so serious that in some French districts great care is taken to light fires as soon as the temperature falls dangerously near to freezing point, and to create clouds of smoke over the vineyard to prevent radiation as much as possible. In one district of France, a telegraph inspector, Lestelle, has introduced an ingenious arrangement for rendering this smoke protection automatic, and applying it as speedily as possible in moments of danger. In the center of the vineyard he places a mercurial thermometer. When this falls to 2 deg. above freezing point, the mercury closes the circuit of a small galvanic battery. This sets in motion a commutator worked by clockwork, which sends the current from a small Ruhmkorff inductor through several circuits of wire in succession. Corresponding to each of these circuits is a heap of suitable combustibles laid ready, and an ignition apparatus, which is fired by the current. These heaps of fuel are placed some forty meters apart, and are of course so composed that their ignition is certain, and that they will smoulder and give off a maximum of smoke. With this apparatus the costs and the unreliability of night watchmen in early spring are done away with, and also the delay attendant on lighting the fires. If a sudden frost comes on, the whole vineyard is enveloped in a few seconds in a cloud of smoke. The cost of the apparatus is given as about $10 per acre, for which space three fires are necessary to insure perfect protection.

AUTOMATIC CLOTHES DRIER.

When closed, the clothes drier here shown takes up no more room than a picture on the wall; and when opened and full of clothes, the rods are raised to the ceiling, so that no more floor space is occupied than if no clothes were drying. The drier consists of a light wooden frame, 4 feet long, 8 inches wide, and 2 inches deep. Inside of the frame, close to the sides, are two ¼ inch round steel rods, sliding on which is a piece of malleable iron, carrying a box or chamber for holding the ends of the bars. When not in use,



NEW AUTOMATIC CLOTHES DRIER.

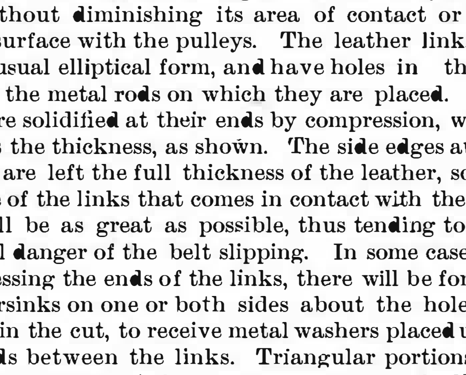
the whole ten arms and chambers can be folded inside of the frame. The arms are each 3 feet long, thus giving thirty feet of line.

The drier has suitably arranged cords and weights, which raise the arms and clothes to the ceiling, and by means of a hand rope the clothes can be pulled down when wanted, or the clothes may be raised and lowered by operating a cord fastened to the sliding frame and then passed over a pulley in the head of the main frame.

Further particulars can be had from the patentees and manufacturers, Messrs. Deverell & Co., of Rouseville, Pa.

LEATHER-LINK MACHINERY BELT.

The principal object of the invention herewith illustrated is to increase the strength and durability of the belt without diminishing its area of contact or frictional surface with the pulleys. The leather links are of the usual elliptical form, and have holes in them to receive the metal rods on which they are placed. The links are solidified at their ends by compression, which reduces the thickness, as shown. The side edges at the center are left the full thickness of the leather, so the surface of the links that comes in contact with the pulleys will be as great as possible, thus tending to prevent all danger of the belt slipping. In some cases, in compressing the ends of the links, there will be formed countersinks on one or both sides about the holes, as shown in the cut, to receive metal washers placed upon the rods between the links. Triangular portions are left uncompressed at the transverse center of the links,



BABCOCK'S LEATHER-LINK MACHINERY BELT.

so that, owing to the loose texture of the leather in an unsolidified state, the links will have a slight central edgewise elasticity, which will relieve the belt of rigidity and the individual links from strain at the ends when passing around the pulleys. The rods are headed at both ends, to retain the links in close contact with each other.

This belt is manufactured by the American Leather-Link Belt Company, of 78 Cliff Street, New York city, and is the invention of the superintendent of that company, Mr. H. C. Babcock.

Echoes at Sea.

The echo fog signal devised by Mr. Frank Della Torre, of Baltimore, has been tested at Fort Carroll, by order of the Navy Department. This apparatus consists of a single barrel breech-loading rifle, provided with a large funnel or speaking trumpet on the muzzle, a box of cartridges, and a tripod. The first experiment was made from a tug, at a distance of half a mile from the fort. With the discharge of the rifle, a distinct echo was heard by those on board the tug, without the use of any receiving apparatus other than the unassisted ear.

When a boat intervened between the tug and the fort, two echoes were heard, the fainter one coming from the vessel. In favorable weather, the echo has been heard four miles. The steam whistle of the tug was also tried, but gave less distinct echoes than the sharp report of a rifle. A passing steamer, about a mile from the tug, gave a very distinct echo. Mr. Della Torre's signal was intended primarily to prevent collisions with icebergs in heavy weather, when it was impossible to be aware of their presence except by means of an echo, but is equally applicable in advising a ship's officer of the neighborhood of another vessel or other obstruction to navigation.

Mr. Bell, it will be remembered, has interested himself in this method of signaling, and believes strongly in its practicability. The navy officers who made the experiments at Fort Carroll will report favorably on the invention, and advise further experimentation. It is suggested that an officer be detailed to try this method of collecting sound on board a United States man of war, so as to test the effect of different states of the weather, and ascertain precisely the range of usefulness possessed by the invention.

Development of the Human Body.

During the International Medical Conference held at Copenhagen, the Rev. Malling Hansen, Principal of the Danish Institution for the Deaf and Dumb, presented a paper which attracted considerable interest. It gave the daily results of weighing and measuring the 130 pupils (72 boys and 58 girls) of the institution during a period of three years. The facts demonstrated by these statistics were quite a surprise to the medical people in attendance. Since this preliminary notice, given in the summer of 1884, Mr. Hansen has continued his observations, and now believes himself able to furnish some outline of bodily development. Each child was weighed four times a day—in the morning, before dinner, after dinner, and in the evening; and was measured once. These daily records show that, contrary to general opinion, the increase in weight and height of the human body during the years of growth does not progress evenly throughout the year. Three distinct periods were observed, and smaller variations were noticeable within these divisions. In bulk, the period of maximum increase extends from August to December. A period of equipoise then succeeds until the middle of April, and the following minimum period completes the year. The lasting increase in weight occurs during the first period; the period of equipoise adds about one-fourth of that increase, but this is almost entirely spent during the last period.

The increase in height shows a similar division into periods, but in a reverse order. In September and October, a child grows only a fifth of what it did in June and July. Thus in the autumn and early winter a child increases in weight, while the height remains stationary. In the early summer, on the contrary, the weight changes but little, while the vital force and nourishment are directed toward an increase in height. This periodicity in the development of the body marks a strong similarity to plant development, and it is quite probable that further investigations would show another likeness in the fact that these results are good only for the latitude in which they were obtained. In a climate less variable than that of Denmark, it is highly probable that the periods would be less marked, and in an even temperature would cease to be distinguishable.

An Exhibition of Barometers.

The Royal Meteorological Society lately held an exhibition of barometers. A paper was read by the president, Mr. Ellis, of Greenwich Observatory, in which the history of the barometer from the time of Torricelli, in 1643, to the present day was treated. The exhibits consisted of specimens of nearly every kind of instrument which has been invented, from the merest glass tube filled with mercury and inverted in a cistern of mercury to diagrams of the King's self-registering barometer and the photographic registering barometer, parts of the (Jordan's) glycerine barometer, and the numerous self-recording barographs and aneroids which have been brought out during the past few years. The best of all such contrivances is the photographic instrument employed at the leading observatories, in which friction is altogether avoided and traces of great clearness and accuracy are obtained. Then there are the mechanical instruments of M. Redier, of Paris, remarkably accurate, and of exceedingly beautiful make, which give a continuous trace of great delicacy. Then, too, there is the admirable self-registering aneroid of M. Richard, in which the effect of friction is obviated by a multiplicity of vacuum chambers. The records of this instrument when carefully made are exceedingly good, and the instrument is relatively very cheap. Of standard, marine, and other barometers there was an abundant supply, and it was interesting to see how the contrivances of 200 years ago for enlarging the scale of the barometrical range are still being reproduced in the ordinary wheel barometer. In addition to the above there was a collection of new instruments of various kinds, in which various nephoscopes and a self-recording thermometer by M. Richard were conspicuous. The exhibition was held, by the permission of the Institute of Civil Engineers, at 25 Great George Street, and was well attended.