

A Master Piece of Mechanism.

There has been on exhibition for some days in the store of Bates & Sons, a Little Monitor sewing machine, made from gold and silver. It is the handiwork of James W. Du Laney, a son of the inventor, and speaks highly for his mechanical ability, taste, and good judgment. The machine was shipped to Philadelphia on Tuesday last. The plate, needle bar, lifters, foot bar, tensions, spool case, and some of the screws are of gold, while the other parts of the machine are of silver and white metal. Upon the bed plate is a neat model of the Little Monitor resting upon the water and surrounded by a wreath of laurels. The Monitor has two flag staffs with flags, and the design gives the entire machine an appearance of elegance and taste that will command much attention from the sight seers at the great show. The machine is in complete working order, well wrought, and proportioned as only a master hand at mechanics could do it.

The firm has now on exhibition at Philadelphia over a dozen machines of different patterns, some inlaid with ivory, others gold mounted, and all bearing testimony to the ability of their manufacturers. In a future issue we shall speak more fully of the machine, its inventor, and the manufactory.—*Rhinebeck Gazette of July 20.*

THE PEARLY ALOE.

One of the most ornamental of the large tribe of aloes, numbering some 200 distinct species, is the *Haworthia subulata*, generally called *aloe margaritifera*, or pearly aloe, of which the annexed engraving is a representation. It has a very short stem, and leaves which are flat above and convex below; in short, triangular in shape and rounded towards the tip. The leaves are covered with a number of white, horny tubercles, which resemble pearls, and give the name to the species. The flowers are greenish, with whitish lobes marked with a green line, and are grouped together in a terminal spike. The beauty of this aloe, however, resides in the leaves, the flowers being, comparatively speaking, insignificant. It is by no means difficult to grow, nor any of the genus to which it belongs; the best soil for it, says J. C., in the *English Garden*, is a mixture of three parts loam and equal parts of leaf mold and sand, and it likes good drainage and partial shade in a cool greenhouse.

Singular Property of Tomato Leaves.

"I planted a peach orchard," writes M. Sroy, of the Society of Horticulture, Valparaiso, "and the trees grew well and strongly. They had but just commenced to bud when they were invaded by the curculio (*pulgion*), which insects were followed, as frequently happens, by ants. Having cut some tomatoes, the idea occurred to me that, by placing some of the leaves around the trunks and branches of the peach trees, I might preserve them from the rays of the sun, which were very powerful.

"My surprise was great, upon the following day, to find the trees entirely free from their enemies, not one remaining, except here and there where a curled leaf prevented the tomato from exercising its influence. These leaves I carefully unrolled, placing upon them fresh ones from the tomato vine, with the result of banishing the last insect and enabling the trees to grow with luxuriance. Wishing to carry still further my experiment, I steeped in water some fresh leaves of the tomato, and sprinkled with this infusion other plants, roses, and oranges. In two days these were also free from the innumerable insects which covered them, and I felt sure that, had I used the same means with my melon patch, I should have met with the same result. I therefore deem it a duty I owe to the Society of Horticulture to make known this singular and useful property of the tomato leaves, which I discovered by the merest accident."

The Battle of the Gazes.

A comparison of the weight and cost of a passenger train on the Eastern, standard gage, and on the Boston, Revere Beach, and Lynn Railroad, narrow gage, respectively, has been made. These two roads run nearly side by side and the carrying capacity of the two trains is practically the same. The heavy Pullman car is a disadvantage to the Eastern road in the comparison, as are also the baggage car, which is not required on the short line. A locomotive, baggage car, Pullman car, and four passenger cars on the Eastern road give capacity for 230 passengers, weigh 138 tons, and cost \$63,000; one locomotive and six passenger cars on the Revere Beach and Lynn road give capacity for 272 passengers, weigh 58 tons, and cost \$18,000.—*Engineering News.*

Railway Economy.

The long engine runs adopted last winter on the New York Central and Hudson River Railroad (engines go through between Buffalo and Albany, 300 miles) have resulted in a notable economy in locomotives, the company having been able to lay up 42 of its stock of engines, notwithstanding a large increase in traffic. There are

other considerable economies effected by it, as in fuel (saving heating up, cleaning, switching, etc.); and the company is altogether satisfied of the wisdom of the change. It is not pleasant for the men, who are compelled to be away from their homes a much longer part of the time; but the economy is such that there is no prospect that the practice will be abandoned for the old one.—*Railroad Gazette.*

Construction and Maintenance of Public Highways.

The Association of Sanitary Surveyors, of London, the other day, at their late conference, discussed the question of road making, but the several bearings of the question were left unsolved. Mr. E. B. Ellice Clark, C.E., the Borough Surveyor of Derby, read an exhaustive paper on the subject, in which he advocated, for macadamised roads, a rough paved foundation, with center channels, instead of side water tables. He also suggested a paving of all streets now macadamised; and stated that granite, wood, and asphalt were severally adapted for varying kinds of roadways—namely, granite for roads where heavy traffic has to be considered, and where noise is not a material objection; wood where quietness is an essential condition; and asphalt in cases where these necessities have to be combined, and where flat gradients and facility of cleansing can be secured.

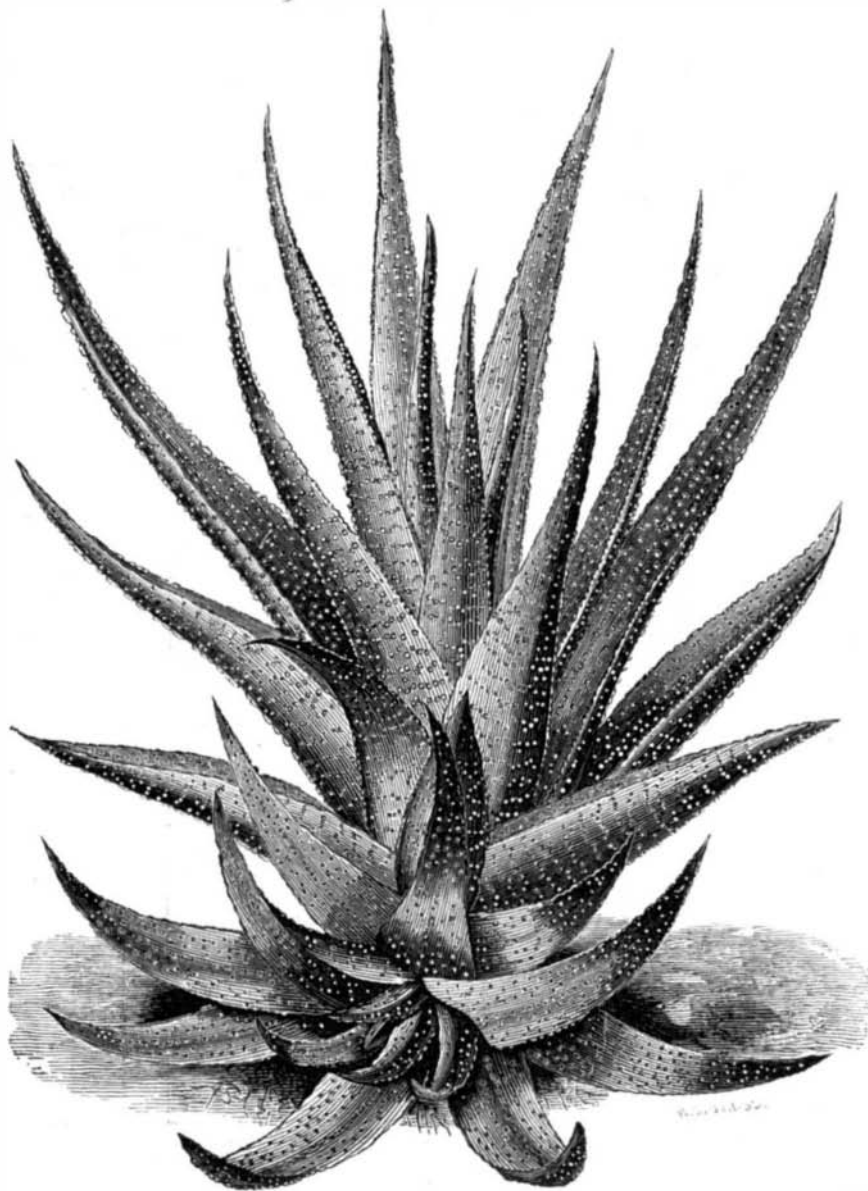
We may learn of the old Romans the art of forming a good foundation. Large stones were first laid—

must be considered in coming to a conclusion. It is shown that Moorgate street, with a daily traffic of 7,400 vehicles, costs 33 cents per square yard per year to pave and maintain. Mr. Clarke estimates a saving of \$250 a year for cleansing a street of about 3,000 square yards in area if paved instead of macadamized. Allowing \$65 per yard, including concrete, as the original cost, the total cost per annum for maintenance is a little over 20 cents per yard, if we allow 8 cents per yard annually for this item. In the annual saving of cleansing, a paved road has by far the greater advantage, and we may therefore at once admit the merits of paving over macadam. The same authority says, *ceteris paribus*, "it is cheaper to pave a roadway having a traffic of 1,000 vehicles per diem over its surface than to macadamize it, and this would be the minimum number to commence paving with."

SUCCESS OF WOOD PAVEMENTS IN LONDON.

As regards paving materials, Mr. William Heywood, the City of London engineer, whose experience may entitle him to be considered an authority, says, speaking of the relative merits of asphalt and wood, asphalt is "the smoothest, driest, and cleanest paving, but wood the most quiet." As regards cleansing, wood is more difficult and expensive to cleanse than asphalt; and as both require occasional strewing with sand or gravel, there is not much difference in this respect. As regards repair both asphalt and wood can be laid and repaired with equal facility; but wood is superior to asphalt as regards safety, whether considered

in reference to the distance a horse can travel before it meets with an accident, the nature of the accident, the facility with which a horse can recover its footing, the speed at which travel is safe, or the gradient at which it can be laid. As to durability and cost, it is shown that in the city wood pavements have a life varying from 6 to 19 years, 10 being an average life with repairs, that the durability of asphalts is not known, but that wood is dearest if we contrast the tenders received for laying and maintaining for a term of years. Again, referring to the safety of the materials, Mr. Heywood reports that a horse can travel 132 miles before a fall takes place on granite, 191 miles on asphalt, and 446 miles on wood. These approximate figures are deduced from observations in the London streets. From the above conclusions there is an overwhelming balance in favor of wood, though granite has its admirers, Mr. Clark thinks that, where there are few shops, and noise is not objectionable, granite is the cheapest and best material; but that in streets of business where absence of noise is a desideratum, preserved wood paving is the best, though expensive. Asphalt, with iron studs on the surface, as used by the Val de Travers Company, is, as Mr. Clark says, objectionable: though we should like to see a combination of wood and asphalt. The Derby surveyor consequently recommends for some of the streets of that town granite pitchers 5 inches by 3 inches, and for others creosoted wood. The experience of London has certainly gone to show us that wood paving is not only less dangerous and less injurious to health than granite, but also more durable than some of the asphalts. The noise of granite paving is unbearable. The objections raised against wood are the absorption of putrescent matter in the fibers, the permeability and splitting of the blocks, and the consequent undermining of the foundation. These are hardly supported by experience. Mr. Deacon, the Liverpool engineer, observes that the wear is very small. Among the different kinds of wood pavement, the "Ligno-Mineral Wood Pavement,"



THE PEARLY ALOE.

in fact, a pavement was formed over the surface by hand, the largest faces being placed downwards, the deepest stones occupying the central part of the road, to bear the heaviest traffic. This pavement of flat stones distributed the pressure; and the principle should never, it appears to us, be lost sight of in road making. The great secret in a good foundation is to distribute the weight over a large area of ground. Speaking on this subject, Mr. Ellice Clark says: "I think it might be laid down as a rule that the harder the bottom of a road is the better, whether for wood, asphalt, granite, or broken stone; and if you do not start with this initial, you will never have a sound roadway." We agree with Mr. Clark in thinking a solid hard substratum a requisite, instead of, as generally, dry core or cinder, devoid of the essential qualities of compactness and stiffness. This may be concrete—in fact, a concrete bottom seems to be the *beau ideal* foundation, though we are not necessarily compelled to resort to a metalling of the most adamantine rigidity. The truth is there is an essential difference between the hardness necessary for roads and the metallic inelasticity some road constructors advocate. Leaving the subject of foundation, we next come to the formation and the materials of the road itself. Here greater diversity of opinion exists. The battle of paving materials has been long waged, and stone, granite, asphalt, and wood have by turns enlisted the public favor. There are a great many strenuous supporters of paving, and we are told that the Manchester streets are examples of the endurance of granite sets. Of course the kind of traffic, whether heavy or light

laid in Gracechurch street—Mowlem & Co.'s method—the "Asphaltic Wood Pavement," and the "Improved Wood Pavement," may be considered among the most desirable. In most of these the blocks, about 9 inches long by 3 inches wide, and 6 inches deep, are filled between with a quantity of lime and gravel, or liquid tar, or asphalt, and the grain of the wood is disposed crosswise to the surface of wear. In all cases it is desirable to saturate the blocks with oils, as in the ligno-mineral process, or to creosote them. Mr. Clark refers to some pavement at Sunderland, where creosoted Baltic red wood was tried, and which required no repairs for five years. Perhaps we may cite the "Improved Wood Pavement," now being laid in various parts of London. Two layers of inch boards, creosoted, laid transversely and longitudinally, are placed on the foundation. Upon this the blocks are placed, kept apart by strips nailed to the flooring.

NICHOLSON SYSTEM.

These joints are then filled in or rammed in with fine ballast, run with liquid tar, the surface of the road being strewn with fine gravel. An elastic foundation is given by this plan of boarded flooring, tending to distribute the pressure, and reducing the wear of the blocks. The ligno-mineral and Carey's wood pavement are laid on a concrete foundation and on a bed of ballast or sand. In the first case the blocks are sawn at an angle of about 60°, the object being to expose the fiber obliquely to the wear. The angles of each course are reversed. Henson's pavement has been tried in America with some success. The great merit of all these pavements is their elasticity.—*The Building News.*