Scientific American.

Machinery and Tools as they are .-- The Steam Engine. (Continued from page 99.)

LAND ENGINES-The constructor of land engines has more opportunity to develope the economical working of steam than the makers of locomotives and engines for steam vessels who are cramped by the restrictions imposed upon them from the character of their work. 'It may be asked,—by what standard is the excellency of a stationary engine to be determined? To this the answer is plain, it is determined chiefly by the amount of duty performed by a given quantity of fuel,-a circumstance influenced greatly by the boiler, but also affected by the construction and management of the engine. Stationary engines are now generally non-condensing, the primary expense being less, and the machinery more simple, although where economy of fuel is of great importance the condenser is still retained.

It is a common mistake to suppose that a high pressure engine is necessarily non-condensing, a mistake which will be corrected by a knowledge that the expression "low pressure" is now applied to steam that a few years since would have been considered far too high for a condensing engine. Thus 4 lbs. per square inch above the pressure of the atmosphere in British marine boilers was thought sufficient, whilst at present it is not unusual with them to use steam at 14 and even 16 lbs. per square inch. But stationary engines are worked at a much higher pressure, and too often the advantages derived from expansion are neglected, although it is when the steam is at a high pressure that the benefits of expansion are most available.

The engines used for the Cornish mines in England have attained some celebrity, owing to their economical working, the steam being expanded from about one-sixth of the stroke, when, by the evaporation of about one pound of water, they are capable of raising 120,000 lbs. one toot high: whereas, a low pressure engine, with the same evaporation, and steam cut off at one half of the stroke, raises only 53,000 lbs. the same height. Perhaps the best construction for a land engine, when it is desired to use the steam expansively to its full extent is to admit the steam freely into a small cylinder during the whole of the stroke, but on leaving this cylinder to allow it ingress into a larger one, where it expands before its escape into the condenser.

The oscillating cylinder is much employed nia, Ohio, New York and New Jersey, the excessive annoyance caused by the dust and for small land engines, as it affords a cheap cinders, led me to contriving some means for substitute for the slide valve, if formed in the usual manner, by which one of the gudgeons the abatement of so great a nuisance, and I now offer you my suggestions in the belief or trunnions is made to regulate the entrance that whoever shall accomplish such an object and exit of the steam, while the other gudgeon or trunnion can be employed to work will greatly promote the comfort and pleasure of the travelling public, and also benefit the the feed-pump. The favorite construction for land engines throughout the United States is railroad companies, by inducing many to travel, who having once made the experiment, that in which the cylinder is placed horizontally on flat beds, on these latter are secured have concluded, like myself, that necessity alone would lead them to repeat it. the guide bars, main plummer blocks, &c. I would attach the apparatus to the tender of When this is not the shape, we generally find the locomotive, which should be made of the that compact form employed in which a vertical cylinder is placed on a pedestal, while same length as the passenger car, or about the cranks below are worked by side rods. thirty feet. Around the bottom of it, and enveloping the running-gear, I would place a Small portable engines for agricultural purposes are now being rapidly introduced, in which tight apron of sheet iron, extending down very nearly to the level of the rails. This case the boiler generally is cylindrical with internal fire-place, and the engine placed on would form a large box, having the apron for its sides and ends, the body of the car for its the top of the boiler which is fixed on wheels so as to be drawn by horses. The diameter top, while its bottom would be the surface of of the cylinder is, in general, about 7 or 8 the earth. Into this box the exhaust steam inches, and it has been found advisable to en- is to be conducted by a large hose of sail-duck case the cylinder, steam pipe, and pump, either | or oth er material. Immediately the steam in the smoke-box, or some other part capable expands over the surface of the ground, which, of protecting them from the frost parched by the rays of suitable condition instantly to absorb a por-No part of the stationary engine has lately been subject to more modifications than the tion of the watery vapor in contact with it. governor, to supersede which a water-regula-And the more finely the earth is pulverized tor is now often used, a variation from the the more rapidly absorption will take place usual form of the governor was on exhibition so that in the space of one second and a half. at the last Fair of the American Institute, and a sufficient quantity of moisture will probawas mentioned in our report at that time. It is bly be received to prevent the dust from otten also constructed in a rather original manrising. This is about the length of time each ner, consisting of a single hollow ball encircled particle would be exposed to the action of the by a zone, there is an opening through the vapor, with a car thirty feet in length and a under side to admit an upright spindle, which speed of thirty miles an hour. A shorter car is attached to the ball by a joint in its centre. might answer with a higher speed, but expe-One side of the ball and zone is heavier than riment only can determine this point. The the other, and consequently, when at rest or principle is simple-to bring the steam into | the result of his long experience and close calmoving slowly, it hangs down, but when driquiet contact with the dust over an extended ven ast the centrifugal force of the heavy side surface. The connecting hose should enter of patient thought, have all been destroyed in set they must be.

of the ball overcomes the centrifugal force, when the throttle-valve will re-open.

We have mentioned the efficiency of the Cornish pumping engines, and comparison shows many points of resemblance between them and the American engines for river steamboats, which latter are so renowned for their performance. The great width of our rivers has been favorable to the system of placing the machinery on deck, which has, by | the moistening of the rails behind the locomothis arrangement, allowed the use of a strong- tive, causing an important diminution of resiser boiler than is attainable when the engines tance to the train, while it does not impair the onion and is propagated from off-shoots, are below. The striking peculiarities of the the tractive power of the engine. American boat engine are visible at the first glance: the trussed beam overhead, the long any interested to test the plan, and having mystroke, the large paddle-wheel, and particu- self no connection with mechanical pursuits, larly the arrangement of the cylinder valves, all different from those of the sea-going vessel. It is, however, remarkable that one of the most eminent English machinists has lately departed from his usual practice, and has if successful, those companies adopting it will used, instead, the American system of valves take pleasure in gratifying the small privilege in a marine engine of 400 horse-power. Nor I shall ask in return. is this, we believe, a solitary instance, the same arrangement having been also lately applied to one of the new steamers belonging to the English West India Steam Co.

Some improvements on the ordinary double spindle valves have also been introduced by a modification of the double beat valve; this is intended to remedy the springing to which the former are occasionally liable. The mode in which the valves are worked, is well known. There are two rock-shafts, one for moving the steam valves, and the other for the exhaust valves. These shafts are worked by separate eccentrics, and give motion to the lifting rods by means of projecting arms, an arrangement that admits of any desired expansion, sometimes only one rock-shaft and eccentric are employed. The expansion is also trequently regulated by having a cut-off or expansion valve placed in the steam pipe like a throttle-valve.

(To be Continued.)

For the Scientific American Railroad Dust and Cinders.

During an excursion made the past summer composed partly of a thousand miles of railroad on seven different routes, in Pennsylva-

atmosphere. The ordinary spark-catcher will be dispensed with, and perhaps even the pipe -a connection only being required with the

duster box. Advantage might also arise from

The above general description will enable I offer it to your valuable journal as the best means of bringing it under the notice of such with this remark, however, that I have no intention of taking a patent, not doubting that J., Jr.

Air Heating Pipes.

The apparatus for heating air for blast furnaces as at present employed is liable to ob- der. But there were many varieties of trees jections which have been obviated in an im- in California unknown in the Atlantic States. proved arrangement by Jesse Young, of Frank- He had not noticed any species of elm or sulin Furnace, Ohio, who has taken measures to secure a patent. The improvement consists cate with and are supported on each other by means of hollow pedestals (one pedestal to similar to the long cone pine. The general opposite ends, so that the air passes all round in March and April-gardening operations the pipe before it arrives at the pedestal .--The air is admitted by an opening in a rectangular-shaped air-chest, which likewise vertical position. The only objection is that also a berry of very delicious flavor, somethey are liable to break when placed in this thing between the raspberry and the blackmanner from exposure to the intense heat; this berry, which was called the salmonberry .by the use of the hollow pedestals which, as counteract the effects of the heat by the current of cold air circulating inside.

Cure for the Croup.

🛫 Dr. Forbes, of Boston, relates, in a late number of the Medical Journal, a case in which a severe attack of croup was cured by the application of sponges wrung out of hot water to the throat, together with water treatment, which he describes as follows :---

"Soon atter making the first application of sponges to the throat, I wrapped the child in a woolen blanket, wrung out in warm water, as a substitute for a warm bath, and gave twenty drops of the wine of antimony in a little sweetened water, which she swallowed with child was so much relieved that I vestured to leave it.

These applications were continued through the night, and in the morning the child was well.

Ancient and Modern Cities.

We are apt to consider London as a considerable city, and New Yorkers regard their village as an immense municipality. But if was the free exposure of the oiled surface to the Mayors of Nineveh and Babylon could re-] the atmosphere. Oils and grease spread over visit the earth they would laugh at the pretensions of the moderns. The area of Babylon was two hundred and twenty-five square miles, and that of Nineveh two hundred and sixteen square miles, while that of London and its environs is but one hundred and fourteen square miles.

overcomes its gravity, and the zone assumes the box in such a manner as to project the a night. One instrument in particular will be nearly a horizontal position. When this is steam horizontally along the bottom of the a great loss. For a year past Mr. Chickering the case a small link inside the ball lowers car, from which it will descend without any has been engaged in planning and constructing the usual brass collar on the spindle, and thus violence of motion, and escape quietly be- a new piano, which would possess many adshuts off part of the steam until the gravity tween the lower edge of the apron and the vantages over those now used in parlors. He ground. The smoke and cinders being forced had spent weeks and weeks upon its preparaalong in company with the steam, will no tion, and had got it so far completed that in a doubt be thoroughly condensed and extin- day or two it would have been ready for exguished, and deposited between the rails, in- hibition. This instrument, with all its patstead of being discharged above to vitiate the terns and scales, is destroyed with the rest.

Agriculture in California.

At the last meeting of the Farmers' Club of this city. Mr. Shelton exhibited some specimens of the Amole or Soap Plant used by the natives for washing purposes. It resembles constant use of it, however, inflames the hands. From the fibre of the plant an excellent article of hemp could be made. The cultivation of the onion had been attended with the most triumphant success. The same might be said of the beet, which grew to an enormous size. It would be no exaggeration to say that beets weighing one hundred pounds each could be grown in California .---In the places were the largest beets were raised, it should be remarked that the subsoil was moist. The sycamore and buttonwood trees grew with great luxuriance in all parts of the country-as also the ash and algar maple, though there was, however, a very valuable sugar-producing tree known as in the use of circular pipes, which communi- the sugar pine, which grew to a great size and produced good timber; in appearance it was each pipe), which are placed alternately at planting season throughout the country was commencing in February as here.

Rev. Mr. Fitch observed that he had discovered, during his journeyings in California. serves as a base, supporting it altogether on some six varieties of gooseberries superior to similar hollow pedestals. The whole appara- any he had before seen. The blackberries tus is fixed horizontally, which is considered and strawberries were much superior to anyby the best authorities upon the subject as a thing we had, and the latter were even supepreferable method to having the pipes in a rior to the English strawberry. There was defect the inventor has ingeniously prevented That name was given it by the Oregonians, who observed that the berries which fell from well as supporting the weight of the pipes, bushes overhanging the rivers were eagerly devoured by the salmon.

The Chairman observed that he had made a good deal of inquiry relative to the cultivation of the grape in South and North America west, and from what he ascertained on the subject, it appeared there was no grape that was worth anything cultivated in those regions that was not of European stock.

Rev. Mr. Fitch corroborated the statement, remarking at the same time that there was no native grape in California, worth cultivation.

Burns and Spontaneous Combustion.

The value of linseed oil and cotton, for burns has long been known. Here is a case of its use, which shows the danger of binding difficulty. I persevered in the application of it too closely, when placed upon a wound : a the hot, moist sponges for an hour, when the child, in Fredericton, N. B., a short time since, burned its leg against a stove; the mother immediately applied linseed oil and cotton-wool, with a tight bandage over all; in a short time the screams of the child induced the mother to remove the bandage, when it was discovered that the cotton-wool had taken fire and had considerably increased the size of the burn. The reason of this spontaneous combustion an extensive surface, and exposed freely to the atmosphere, oxydize so rapidly as to engender great heat, and ignition, producing what is termed "spontaneous combustion." Oiled cotton put on burns, or used for any purpose, should be secluded from the atmosphere.

107

Chickering's Planoforte Manufactory. The above building was lately destroyed at a fire in Boston, by which the owner has been defective and unsatistactory. The endeavors a great loser, but Mr. Chickering's loss is not to improve this service, have been rendered to be measured by money: the patterns, the abortive by a want of unity among the railscales, and all the drawings, which have been culations,-the work of many an evening hour Jersey ones then; what an accommodating

The Postmaster General in his report states that "the service between New York and Washington, though much improved, is still road companies running between Philadelphia and New York.' These railroads are the