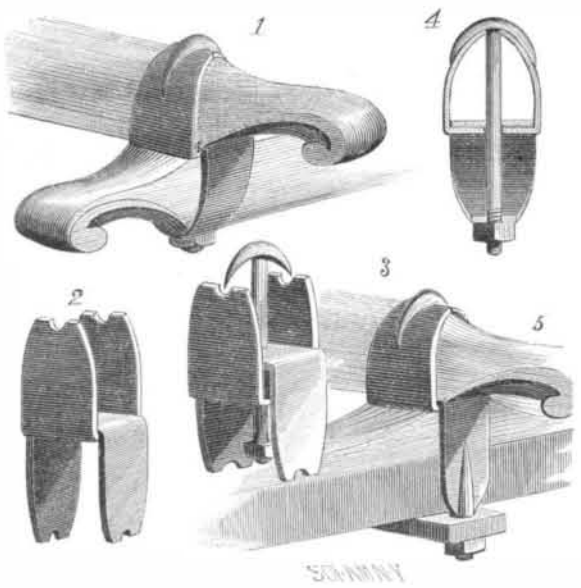
CLIP COUPLING FOR VEHICLES.

The clip coupling shown in Figs. 1, 3, and 4 is made of two suitable metal plates shaped as clearly shown. In using this coupling to clip a wagon side bar to a head block, the side bar is placed between the side parts of the upper plate, and the head block between the side parts of the lower plate. The clip bolt is then passed through suitable holes, and the side parts are bent inward to conform to the surfaces of the side bar and head block, the end notches in the plates inclosing the bolt immediately beneath its curved head and inside of its nut. When the nut is tightened, the curved head will hold the sides of the upper plate to the side



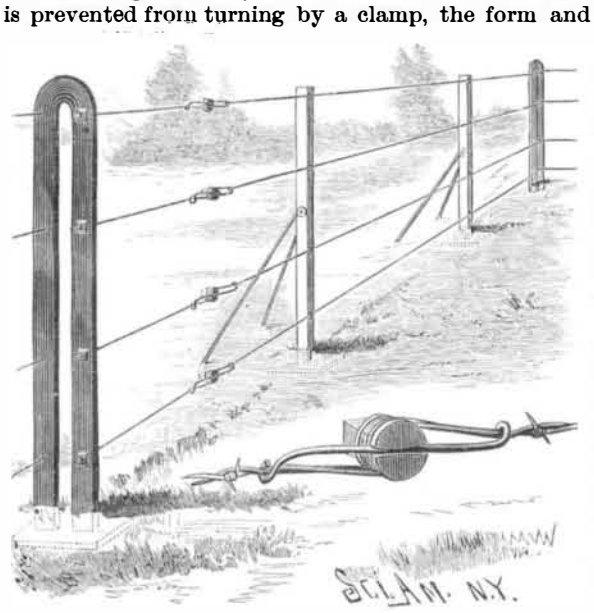
TYLEE'S CLIP COUPLING FOR VEHICLES.

bar, and the nut will hold the sides of the lower plate. It is evident that this coupling is very light and strong, of a neat appearance, and its use prevents splitting of the wood. The clip may be made of a single piece of metal, as shown in Fig. 2. How a side bar may be clipped directly to an axle is very clearly shown in Fig. 5.

This invention has been patented by Mr. James E. Tylee. Further particulars may be had by addressing Mr. Ben. S. Clarke, of Ashland, Neb.

FENCE WIRE TIGHTENER.

This simple and effective device, wherewith the undue slackness of fence wires may be taken up at any time, is the invention of Mr. T. C. Histed, of Cherry Vale, Kas. The wires pass through holes in the end posts of one section of the fence, and project far enough to receive spiral springs between the posts and buttons fixed to the ends of the wires. These springs provide for the expansion and contraction of the wires by changes in temperature. Upon each wire of each section of fence is placed a tension roller, formed with a squared hub at one side, to which a wrench may be applied for turning it. Its opposite end has a diametrical slot to receive the fence wire. After the wire has been tightened by and on the roller, the latter is prevented from turning by a clamp, the form and



HISTED'S FENCE WIRE TIGHTENER.

application of which are clearly shown in the small view. By means of this device a fence may, with very little attention, be kept in good condition as long as the wires last.

The Eruption of Etna.

The following particulars of the recent eruption of Mount Etna have been furnished by M. Silvestri, the well-known authority on these matters. The eruption began at half an hour after midnight on May 19, and lasted twenty days, that is to say, until June 7. The climax of the eruption took place on the night of the 23d of May, and after an intermittent action for several days, the phenomenon gradually abated. The eruption emanated from a "crater of ejection" and a system of "mouths," or as they are locally termed *bocca di fuoco*. The crater of ejection was formed at an altitude of 1,400 meters above the level of the sea, and in the valley between Mont Nero on the north and Mont Grasso on the south. This crater soon became a hillock, however, owing to the matter ejected. The mouths emitting lava were also in this part of the mountain, and it is calculated that they poured out from 40 to 60 cubic meters of lava a second. During the first three days the lava flowed about 4 kilometers, with an initial speed of 40 to 60 meters per minute near the mouths. This speed, however, was reduced to from 18 to 20 meters per hour on the extreme front of the advancing flow. After the 24th of May the crater threw out great quantities of sand, which produced a thick fog, and fell in abundance during several days in Sicily and Calabria. This ejection of sand characterizes the decreasing phase of a volcanic eruption. On the 29th of May, the eruption having declined, repeated earthquake shocks were heard; one of special violence on the night of June 2, when some houses in Aci-Patane were fractured. The strongest shock, however, was felt on June 5, about fifteen minutes after noon. This brought some buildings to the ground, and was characterized by an undulatory movement lasting from eight to ten seconds. The central crater of Etna also emitted great volumes of thick smoke and fine ashes on June 2, and the air is still charged with these emissions.

Oil Fuel not Economical.

From Glasgow, the *Shipping World* says, "comes evidence of an unmistakable character that oil has been tried and found wanting. The managers of the Laird line, after a long trial of oil on board one of their steamers, have decided, on purely economic grounds, to abandon altogether the use of oil as a fuel, having ascertained from practical tests extending over a considerable period that coal is the cheaper fuel of the two. Accordingly, they have had the oil tanks taken out of their vessel, and have returned to the use of coal, notwithstanding the fact that the oil tanks and the apparatus for accomplishing complete combustion of the oil cost a considerable sum of money. Although considerable ingenuity has been displayed, and several difficulties have been overcome, there is nothing in the latest apparatus and arrangements which have been adopted in Southeastern Russia, where petroleum has been extensively used as fuel, which appears likely to expedite the adoption of liquid fuel in our mercantile marine. There is little probability of petroleum being sold in this country at a price which will enable it to take the place of coal."

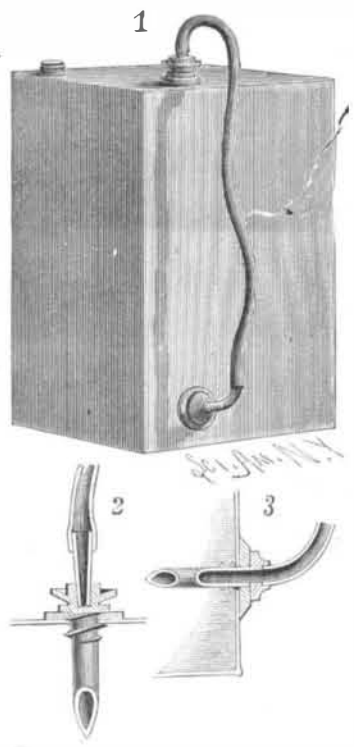
Panama Canal.

The Panama Canal Committee resolved on the 28th of June to ask five of the Ministers to confer with it. Although the Committee, which was nominated by a very thin attendance in the Bureaux, is hostile to the scheme, these explanations may modify its views. Even, however, should its report be adverse, it will be difficult, if not impossible, for the Chamber to refuse to sanction the lottery loan of 600,000,000f., required by the company for the completion of the canal. It is admitted that M. De Lesseps did not foresee all the technical and climatic difficulties with which he would have to cope. If the works commenced, and now far advanced, had to be abandoned by the present company, the Americans would take its place, reaping the entire fruits of what has been done; while the French investors would have no equivalent whatever for their sacrifices. The *Times* Paris correspondent says: "It being certain that if France abandons the enterprise, America will take it up and complete it for her own exclusive profit, it cannot be supposed that the Chamber will debar the shareholders from their chance of sooner or later being recouped for their outlay when the canal begins, like that of Suez, to realize profits. The inference is therefore that, despite all the difficulties springing up in the company's way, the bill will pass the Chamber, which can scarcely pretend to be more mindful of the subscribers' interests than the subscribers themselves are."

The London *Times* correspondent is mistaken in asserting that the Americans will take up the Panama Canal project if the French abandon it. There is not the slightest evidence of any such desire or intention on the part of the people of this country. The Americans, with their new dredgers, have dug out, for good pay, employed by the French, the short section of the canal that goes through soft ground, on this side of the isthmus—the only part so far completed. The Americans built the Panama Railroad, and sold it out to the French at an enormous profit. They have also built three lines of railway across their own domain; and they expect soon to construct a great ship railway over the Isthmus of Tehuantepec. But they have no idea of undertaking such an unprofitable scheme as the Panama Canal.

LAMP FILLING ATTACHMENT FOR OIL CANS.

The attachment consists of a flexible tube, one end of which is connected to a metallic tube, Fig. 3, formed with a sharp steel point. This tube has a collar, below which is a prominent screw thread, and its extending end is bent to form a handle or lever. The other end of the flexible tube is secured to a nozzle Fig. 2, fitting within the socket of a venting attachment consisting of a steel pointed tube formed with a collar, thread, and milled thumb nut. The attachment is secured to the can by forcing the steel point through the can and then turning, to make the collar firmly clasp a rubber gasket placed between it and the can. The venting attachment is placed in the top, and the other in one side, near the bottom of the can. When the liquid is to be drawn from the can the nozzle is inserted in the vessel to be filled, which is lowered below the level of the liquid in the can. After the vessel has been filled, the nozzle is placed within the socket, as shown in Fig. 1, thus practically closing the can, and preventing the evaporation of its contents.

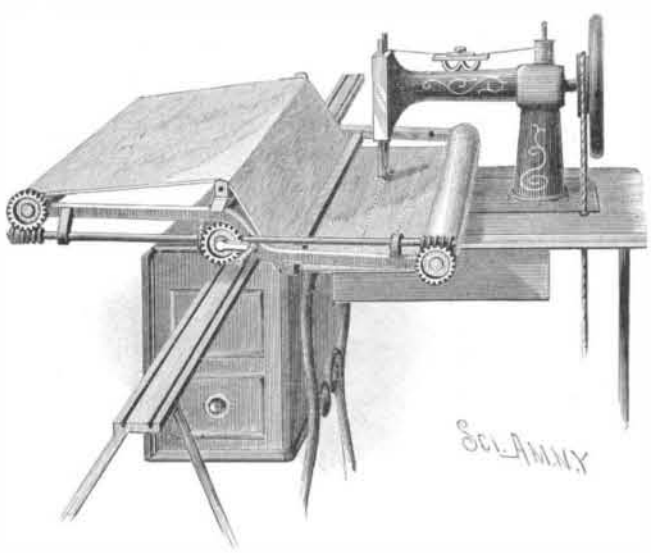


McFARLAND'S LAMP FILLING ATTACHMENT FOR OIL CANS.

This invention has been patented by Mr. James M. McFarland, of Virginia City, Nevada.

IMPROVED QUILTING FRAME.

Journaled in one end of the side pieces of the frame is a roller, on which the quilt is first wound, while at the other end is a second roller, on which the quilt is wound as the quilting proceeds. The second roller is of larger diameter than the first, in order to always keep the quilt taut. In passing from one roller to the other the quilt passes first under a cross bar or brace, and thence over a roller. Journaled in blocks on one of the side pieces is a shaft formed with a worm at each end; these worms mesh with wheels on the ends of the rollers, so that when the shaft is revolved the rollers turn in opposite directions. When at rest, the worms prevent the rollers from revolving, and the quilt is thus kept taut without the use of ratchet and ratchet wheels. The shaft is revolved by means of a crank and suitably arranged gears. The side bars are bent as shown in the engraving, and the frame is thereby permitted to be moved readily across the machine table



WRIGHT'S IMPROVED QUILTING FRAME.

with but little friction, and the quilt is brought close to the table. This quilting frame is very easy to operate, as it is only necessary to turn the crank to shift the quilt as the work proceeds, and it is durable and not liable to get out of order.

This invention has been patented by Mr. John E. Wright, of Corydon, Iowa.

LIGHTNING struck an oak in Tippecanoe County, Indiana, and tore it into splinters. It is said that each year's layer of the growth seemed to have been separated from the other, and split into strips about half an inch wide. After completing its work on the oak, the lightning ran thirty yards along a wire fence.

Renovating Old Trees.

In very old trees, restorative measures often fail to produce any lasting improvement. But in the case of trees that are still comparatively young, and which may be suffering from neglect of some kind, and are not deficient in vitality, renovating measures are often attended with most satisfactory results. It takes time, however, and patience must be exercised. What has been going wrong, may be for years, will require a proportionately long period to be put right again, but the progress of improvement will be more rapid every year. This is owing to the peculiarities of tree growth. Improvement always, of course, takes the shape of better growth, healthy foilage, and stronger wood. These in turn deposit fresh layers of tissue, which promote a more active circulation of the juices every season, the effects of which are observable in the more rapid distention of the trunk and limbs and a proportionate increase in the roots, till, in time, the tree grows out of its debility, and recovers. Old fruit trees are oftener operated upon in this way than other subjects, and there are few gardeners who are not familiar with examples of old or feeble vines or peaches, etc., that have, so to speak, been made to renew their youth in the course of a few years. Feeble-growing and unhealthy trees are, as a rule, the result of starvation, bad soil, or unfavorable conditions of the atmosphere, climatic or otherwise. When a tree dies from old age, the signs are plain enough, and very little can be done to help it except taking great care of the scant foliage it puts forth each year, and encouraging young growth by every means to sustain the flickering vitality; but in other cases the same signs are observable in young trees, the causes of which may be found and removed. One of the surest signs of debility is the pushing of adventitious growths from the trunk and main branches, and the dying off year by year of the twiggy terminal shoots. The sap does not circulate freely to the extremities, but chiefly about the trunk, putting out a feeble growth on those parts which grow stronger the nearer they approach the root. Old laurels often afford very good examples of this.

When the tree is healthy, the top is luxuriant; when it is weak or old, the top dies, or makes little or no growth, and small shoots sprout out all over the trunk. Very often, when such bushes are cut over, they push from the base and do well; and if aided by a good soil put to the roots, the result will be all the more satisfactory. In fact, renovating measures may be said to consist in the judicious removal of the feeble decaying tops and branches, and encouraging fresh root action. The trees should be pruned rather late in the spring, when growth is about commencing, and only the really diseased or dead portions should be cut away. This having been done, the roots should be examined, and, if there be reason to suppose that water stagnates about them, the site should be drained thoroughly. In such a case, that of itself will effect a cure. We remember once a case of several young trees that were mysteriously dying off year after year at the extremities of their shoots, a wet soil not being suspected as the cause, because the whole ground had been drained years before.

The accidental digging of a pit near where they grew, however, revealed the water standing within 15 inches of the surface, owing to the main drain having been choked up. We need not say the obstruction was removed, and the soil and trees both presented a better appearance afterward. But it is not so often that want of drainage is the cause of trees dying. In thin, indifferent soils the cause is simply want of sufficient nourishment and drought—both bad in themselves; and the cure is a good layer of fresh soil, common manure, leaf mould, and the like laid over the roots, and thorough watering during the summer whenever the ground is the least dry. Only those acquainted with such matters know how dry the soil becomes where the roots of trees abound, and it takes much water to soak it afterward. The fresh soil and the water will work wonders. The effects will not be very apparent the first season, unless it be in the production of numerous buds and small growths from the older wood; but the next year, and years following, the progress will be very marked, till the tree quite fills up with young, healthy growth again. This is observable in the case of all evergreens, but especially in yews, hollies, and rhododendrons, etc. Conifers, too, reciprocate such generous treatment, but they must not be allowed to go too far, as it would then be almost as well to plant fresh trees.

At the present time, or perhaps next summer, we need not be surprised to see many trees showing signs of debility, because the soil got too dry last year, and in many places has not yet had sufficient rain to soak it thoroughly. Consequently, unless the rainfall of the coming months is sufficient, deep-rooting trees will suffer, not only from drought, but from want of food, because without water the roots cannot avail themselves of the food that is in the soil. We have frequently noticed trees that have shown the first signs of decay the season after a long drought, as in 1868, which was succeeded by dry seasons. For want of sufficient moisture, a tree may starve with its roots in the midst of plenty. No plant affords a more striking example of the effects of renovating measures than the vine. Old plants that have become bark-bound will, after being lifted at the root and allowed more development at the top, rend their old bark in all directions, and swell up to twice the thickness they were before, and that in two or three years, the leaves and crops augmenting proportionately. We have seen feeble old vines eighty years old quite restored in this way, and produce fine young wood of greater girth than the old stems, and bear remarkably fine fruit that took prizes at exhibitions.—*J. S., in The Garden.*

Wanted, a Novelty.

Long ago was it declared, "There is no new thing under the sun;" and the sentence is one of the most familiar and oft-quoted, because its truth is so frequently brought home to us.

Every now and then we read in the newspapers of some wonderful mechanical invention or unexpected development of science. We hug to ourselves the idea that at last we are in possession of a novelty, and a wonderful one to boot; but, as a matter of fact, we have as yet rarely, if at all, hit on anything that has not been at least thought of and striven for before.

When the "Art of Flying" shall be at last attained, it will be no novelty to the unfortunate inventor immortalized in the "Mark of Cain;" and if people only hunt up the authorities on the subject—and a capital list is given in the book—they will see in the successful flying machine quite an old idea, to which success was long denied. In the same way, the wonders of our nineteenth century are all children of a past period.

We unite in hailing the electric telegraph as the wonder of the age; but the idea is as old as 1637, at least. Scherwenter, in his "Delassements Physico-Mathematiques," published in that year, explains how two individuals can communicate with each other by means of the magnetic needle. In 1746 Le Monnier, by a series of experiments in the Royal Gardens in Paris, showed how electricity could be transmitted through iron wire, 950 fathoms in length; and in 1753 there was a remarkable description of the electric telegraph in the *Scots Magazine*, in an article entitled "An Expeditious Method of Conveying Intelligence," by Charles Marshall. In 1774 we find an electric telegraph in full working order, and capable of transmitting messages. This was the invention of George Louis Lesage, Professor of Mathematics at Geneva, who announced it in 1760, so fully assured was he of successfully carrying out his idea. His instrument was composed of twenty-four metallic wires, separate from each other, and inclosed in a non-conducting substance. Each wire ended in a stalk, mounted with a little ball of elder wood, suspended by a silk thread. When a stream of electricity, no matter how slight, was sent through the wire, the elder-ball at the end was repelled, such movement designating some letter of the alphabet. A few years later, in Arthur Young's "Travels in France," we read of a similar machine, the invention of a M. Lomond, of Paris.

Photography is making such rapid strides that we are almost inclined to believe it a novelty, the beautiful pictures we now obtain by its aid in the hands of accomplished artists are so superior to the daubs that satisfied our grandfathers. But the photography of the present is after all only a skillful development of a very old idea. Sun-painting by the daguerreotype was known to Leonardo da Vinci in the fifteenth century. The art then lay in oblivion till 1760, when it was clearly indicated in a book published in Paris, entitled "Giphantie," written by Tiphanie de la Roche. Josiah Wedgwood, Sir Humphry Davy, and James Watt made experiments on the action of light upon nitrate of silver at the beginning of the present century, and that their efforts were attended with some success is proved by the fact that many years afterward, among the old household lumber of Watt's partner, Matthew Boulton, was found a representation of the old premises at Soho on a silvered copper plate, apparently taken by some such process.

We often hear the Thames tunnel cited as an example of the wonderful genius of modern engineering, but the tunnel under the Euphrates at ancient Babylon was equally wonderful, and that under the wide mouth of the harbor at Marseilles was a far greater enterprise, while both these ancient works were as skillfully executed as the modern.

In the Museum of the Arsenal at Venice there are numerous firearms of the fifteenth and sixteenth centuries that forestall many of our most recent improvements, such as revolving pistols, rifled muskets, and breech loading cannon. The latter, which, as Sir William Armstrong's, may be considered quite a modern idea, strange to say had been fished up from the Adriatic, where the ship that carried it had been sunk some hundreds of years. Perkins' steam gun was an old invention revived by Leonardo da Vinci, and by him attributed to Archimedes.

Steam locomotion by sea and land had always been a dream of scientists. As early as 1543 Blasco de Garay tried to accomplish it in the harbor of Barcelona. Denis Papin made a similar attempt at Cassel in 1707. But it was not till the problem of the steam engine had been solved by Watt that the idea of steam locomotion could be put in practice. Inventors have frequently been unsuccessful by not discovering exactly where they fail, and consequently directing their energies to the wrong points, just as Arkwright would have failed with his spinning machine because he could not get his valves to the required thickness. And after all, nothing was wanted except to chalk them; but he had to part with half his profits for the slight but all important information. Though Denis Papin was unsuccessful in his attempt to effect steam locomotion, to him is due the credit of having first thrown out the idea of atmospheric locomotion; and another Frenchman, Gauthey, in 1782 projected a method of conveying parcels and merchandise similar to the now familiar pneumatic tube.

The reaping machine, even, is an old invention. Barnabe Googe, in a book translated from the German, entitled "The Whole Arte of Husbandrie," published in 1577, speaks of it as a worn out invention—a thing "which was woont to be used in France. The device was a lowe kinde of carre with a couple of wheeles, and the frunt armed with sharp syckles, whiche, forced by the beaste through the corne, did cut down al before it. This tricke might be used in levell and champion countreys, but with us it wolde make but ill favoured woorke."

Even in medical science many of what we consider new methods are only old ones revived. The Romans regularly practiced hydropathy, and established baths wherever they went. The employment of anæsthetics is also a revival. The use of ether as an anæsthetic was known to Albertus Magnus in the thirteenth century, and in his works he gives directions for its preparation. In 1681 Denis Papin published his "Traité des Opérations sans Douleur," showing that he had discovered methods of deadening pain. But anæsthetics were known to the ancients, who had their nepenthe and mandragora, while the Chinese had their mayo, and the Egyptians their hasheesh—both preparations of Cannabis indica, and somewhat similar in effect to chloroform.

Gunpowder was known to the Romans, though they only used it for fireworks; and in one particular we are, as yet, behind, for the secret of the terrible and destructive Greek fire has been lost altogether.

Suspension bridges—comparatively new to us—were known in China for centuries; and the people of the same country used coal gas regularly for lighting purposes long before we did.

These are facts easily ascertainable by slight historical research, but it is possible that they will come as a rude awakening to some who scan them, and who have religiously hugged to themselves the belief that they live in the most wonderful age that has yet dawned on civilization.

"To-day" certainly is better and more comfortable than the "good old times," but it is only a question of progress. It is probable that man's powers have a limit beyond which they cannot go, and a common basis from which in all times they have sprung. The man of to-day is not cleverer than his ancestors, but he has the benefit of the experience of mankind in the past centuries, and he starts from school or college with all that they possessed at his fingers' ends, and ever ready for reference in the nearest library, in so far as history is complete.—*A. F., in The Graphic.*

Positive and Negative Electricity.

Dr. Wachter, of Vienna, has recently communicated to the Academy of Science in that city a paper in which he attempts to prove that, contrary to the generally accepted belief, crediting positive and negative electricity with absolutely analogous properties differing only in sign, there are between them many points of diversity. He maintains that the properties of the two electricities are totally different, and these differences manifest themselves in regard to (1) equipotential surfaces, (2) direction of movement, (3) magnetic, (4) thermic, and (5) optic properties; also (6) in regard to the substances electrified. Dr. Wachter treats only of the first and second headings. He asserts that in conductors of great specific resistance the point where the potential has a mean value lies, not midway between the extreme ends of the conductor, but somewhat nearer the negative end. If equal quantities of positive and negative electricity accumulate respectively on two conductors of equal size, the potential, measured by means of an electrometer, has a greater value, irrespective of the sign, on the positive than on the negative conductor. The electric mill revolves in the direction of the flow of positive electricity, which proves that the movement of the molecules of air around a positive and negative point is different. The appearance of the discharge from such points is also different, indicating an inequality in the equipotential surfaces.

To make a good pomade for the hair, take of castor oil 1 pound avoirdupois, pure white wax 4 ounces, melt them together, and then add oil of bergamot 2½ drachms, oil of lavender (English) ½ drachm, essence royale. Stir the mixture while cooling.