### Recent Inventions.

An improvement in Carving Forks has been patented by Mr. Daniel Williams, of West Philadelphia, Pa. The object of this invention is to provide an attachment to carving forks for releasing from the fork any substance held by it.

Mr. Asa Brooks, of Hawleyton, N. Y., has devised an improved Machine for Calcimining, Painting and Whitewashing the ceilings of rooms. It is so constructed as to do the work in a rapid and workmanlike manner.

An improved Apparatus and Process for Annealing Glass has been patented by Mr. Auguste Weyer, of New York city. The object of this invention is to anneal glass in such a manner that a greater homogeneity is imparted to the same, which enables it to resist considerable changes of temperature without being liable to crack or break.

Messrs. Geraldo A. Beeman and John T. Mason, of Comanche, Tex., have patented an improved Pump having two barrels of different diameters, the larger being subjacent to the smaller, and each provided with a valved piston, said pistons being both secured to the same piston rod. It has a weight arranged to counterbalance the added weights of the water columns above the smaller and below the larger piston.

An improved Machine for Hulling, Scouring, and Cleaning Coffee has been patented by Mr. Patrick McAuliffe, of New York city. This invention relates to an improved machine by which coffee of all grades may be hulled, scoured, and cleaned, and different kinds and grades of coffee mixed and turned out with uniform appearance, and by which no annoyance from dust is experienced as the impurities are drawn off and collected. The machine has a continuous operation, as it receives the coffee at one end and discharges it at the opposite end in a uniform and marketable condition.

Messrs. Charles F. Bailey and George F. Perrenot, of Rockport, Tex., have patented an improved Machine for Ironing Clothes, pressing seams, fluting, etc. It is simple, convenient and effective.

An improvement in Bed Bottoms has been patented by Mr. Henry S. Cate, of Millerstown, Pa. This invention relates to improvements in the bed bottom for which letters patent were granted to the same inventor April 9, 1878, and numbered 202,149. It consists of an outer frame and a number of intermediate cross shaped pieces or links, that are connected longitudinally and transversely by elastic strips with each other, with the frame, and with longitudinal rods or slats interposed between the cross pieces. The cross pieces are raised by means of wood or leather blocks placed between them and the supporting strips, so as to raise them above the slats. End cross strips of the outer frame serve as guards in case of breakage.

An improvement in Burial Caskets has been patented by Mr. William J. Noble, of New York city. The coffin has a novel catch that engages with the latch of the sliding cover. The face glass is set in a frame and arranged to slide back beneath the cover.

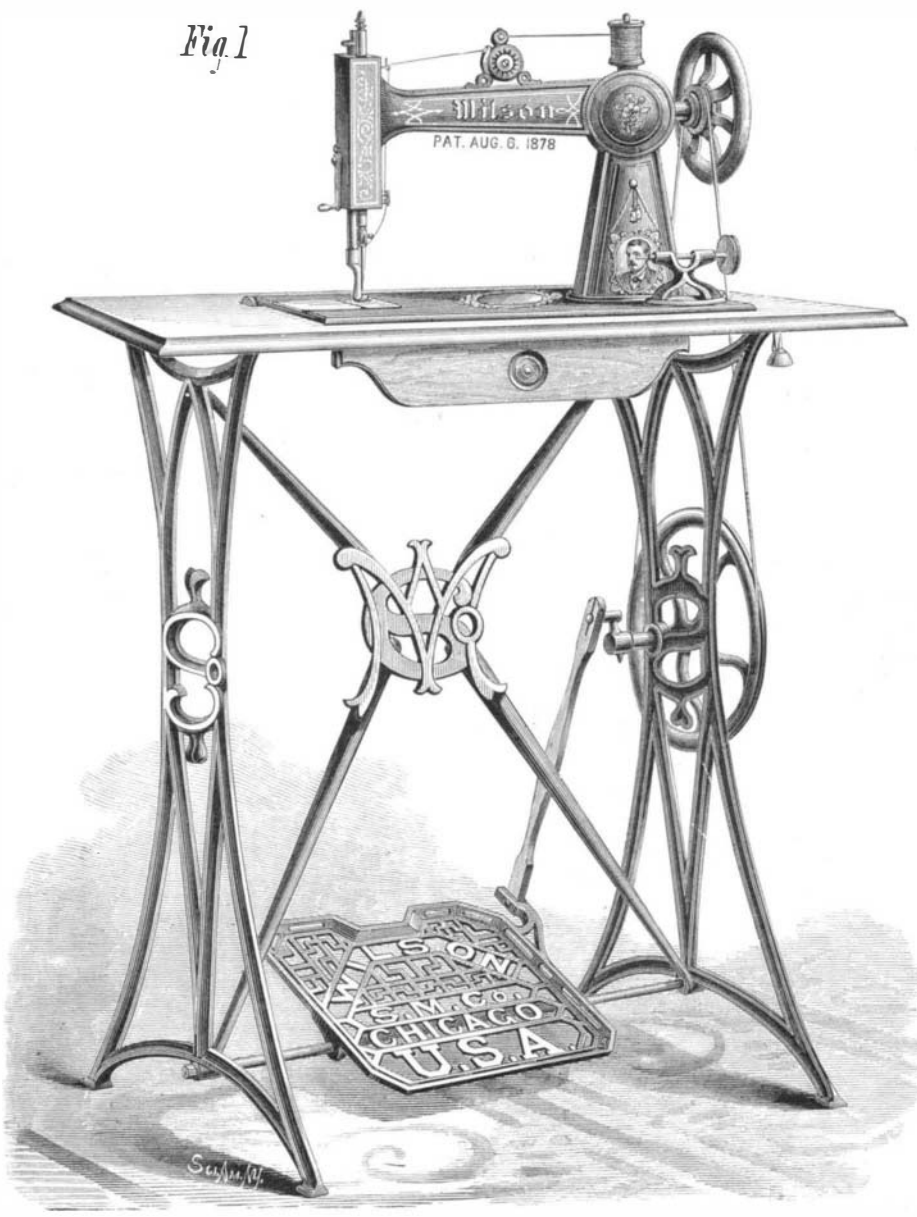
An improvement in Ash Sifters has been patented by Mr. William E. Brush, of New York city. This invention is an improvement in the class of ash sifters having a curved or sémicircular bottom, upon which they may be rocked, for the purpose of separating the ashes from the coal cinders.

### New Ways to Use Iron Wanted.

In view of the plain fact that existing establishments for the production of iron and steel have a capacity far in excess of any probable demand likely to arise in the natural course of trade, the (London) *Iron* proposes a new policy for the iron trade. The business of iron masters, it argues, should be not merely to make iron, but to discover and devise new ways for using iron; and mention is made of a few instances in which a well directed effort to extend the use of iron and steel could not fail of success.

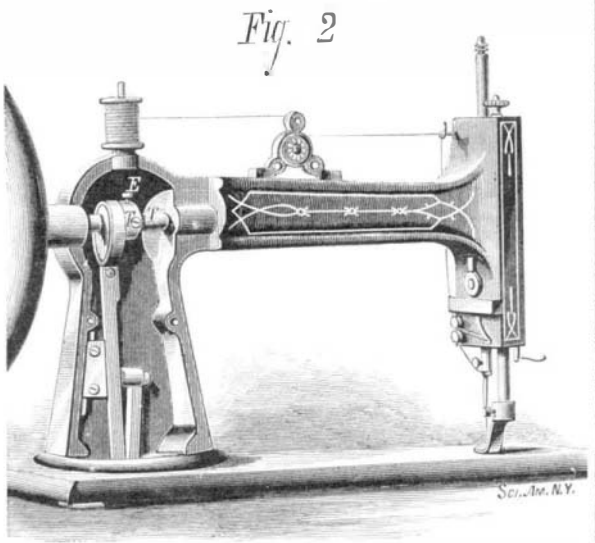
"Without dwelling on the far too limited employment of these metals in bridge and ship building purposes—for which their superiority is uncontested—one cannot fail to be struck with the great field offered by the permanent way of railways for the disposal of our surplus stocks. Mr. Wood's estimate that some forty millions of railway sleepers have to be replaced annually at a cost of over six millions sterling, is probably not far from correct. That a permanent way constructed wholly of iron or steel is at least equal, if not superior, to the existing compound system, has been demonstrated in India, Belgium, and Germany. With an economical mode of protecting the metallic sleepers from corrosion, the advantages would be still greater. Without implicitly adopting Mr. Wood's estimate that the railways would save three millions a year by the change, it cannot be doubted that it would be a highly beneficial one both for the companies and ironmasters. It is, moreover, a change which must inevitably come sooner or later, since wood is becoming yearly dearer and dearer; while there is hardly a civilized country which is not suffering—in deterioration of climate—from the destruction of timber, of which the demands of railway engineers are a prime cause. It will not be much longer endured that the preservation of a certain proportion of forest land, which is demanded alike in the interests of hygiene and agriculture, should be rendered impossible because the conservative instinct of engineers prefers continuing to use timber for purposes for which it is less well suited than iron. The enormous destruction of young trees for the supply of pit props might also be very materially lessened by the use of removable iron pillars in the many situations in which they can be successfully employed in mining.

Fig. 1




NEW WILSON SHUTTLE SEWING MACHINE.

Fig. 2



WILSON SEWING MACHINE—SIDE REMOVED.

"By the use of steel for the framework of railway carriages and trucks there would result a gain in strength, lightness, and durability; while the saving of life and property in accidents, by having cars which would present an enormous resistance to crushing, would alone justify the change. Architects are already using iron girders with some freedom, and with the experience they have thus gained of the use of metal in construction, it would require but little encouragement to induce them to adopt it much more largely in all positions where the maximum of strength with the minimum of bulk is sought. There is, however, a most singular prejudice against iron, very prevalent among architects, on the score of æsthetics. Now the truth is, that no material lends itself more readily to the most graceful and beautiful forms. Not only does its extraordinary strength enable cumbrous buttresses and bulky pillars to be dispensed with, and the widest spaces to be roofed with a single span, but, owing to the facility with which the most intricate designs may be reproduced by casting, cornice, frieze, and finial may be enriched with a luxuriance of ornament difficult of attainment by the worker in stone or wood. There is much room, too, for the increased use of iron for such purposes as fencing, the construction of outbuildings, for wheels, and telegraph posts, and a thousand minor outlets which it would be tedious to enumerate.

"While all are agreed that a vastly extended use of iron would be a matter of general advantage, are we to wait till consumers, retarded by the ponderous inertia of prejudice and ignorance, appreciate the fact in their own good time, or is it not allowable to accelerate a result so generally desirable by every legitimate means? We have had enough of masterly inactivity. The occasion is favorable for adopting a more progressive policy, which, if vigorously prosecuted, will certainly bear good fruit. Let the two bodies which represent the scientific (or technical) and the commercial interests of the iron trade appoint a Joint committee to draught a scheme for an association whose business it should be to extend the use of steel and iron. Some such body has already been formed in Belgium (though as yet it has shown few signs of life), and there is no reason why the movement should not be taken part in by the iron trade of all iron making countries, their interest being in this matter identical. The work of the association would consist in the collection of unimpeachable and carefully verified data as to the relative strength, durability, and cost of steel and iron as compared with wood, brick, and stone; to point out the particular directions in which the best results may be expected to follow from the substitution of the superior material for inferior ones, and to induce manufacturers generally to adopt definite sizes and patterns for the leading articles of manufacture, such as girders and columns, in lieu of the present perplexing variety, which is a relic of the days when standard gauges for screws and wire were not; to collect trustworthy information as to promising inventions tending to economy of make, and possibly to encourage judiciously the direction of invention into useful channels; above all, to give the greatest possible publicity to their recommendations and the facts on which they are founded. Such would be some of the functions that the new body could be called on to perform. By the adoption of such measures as this, we believe that such an impetus would be given to demand that the equilibrium so long destroyed would be speedily restored. The policy of *laissez-faire* has been tried; if a more vigorous policy fails of success, it will at least deserve it."

### THE NEW WILSON OSCILLATING SHUTTLE SEWING MACHINE.

The sewing machine in its most perfect form is peculiarly an American manufacture. This industry, which has already attained such gigantic proportions in this country, is destined to increase, for our sewing machine manufacturers have the entire world as a market for their goods.

Among the few leading sewing machines, the Wilson as formerly constructed may undoubtedly be mentioned as one of the best. The new Wilson sewing machine, which is shown in perspective in Fig. 1, and in detail in the other engravings, and which is about to be placed upon the market, is remarkable for the peculiar combination of mechanism by which all of the movements required to make the stitch are effected by few and simple parts.

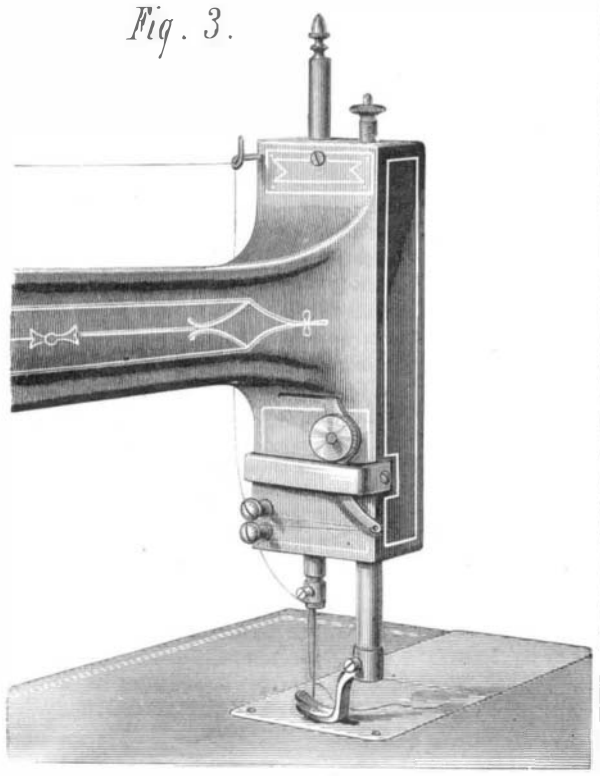
This machine is the result of years of experiment conducted by skilled workmen. We are advised that the Wilson Sewing Machine Company have a corps of ingenious and competent workmen constantly employed in improving the machine and devising new means and methods of manufacture, so that they may not only produce a machine of superior excellence, but may do it economically, so that both the manufacturer and the purchaser may share the benefits. Wherever a machine can be simplified without impairing its efficiency, it not only lessens the cost of manufacture, but it also increases its durability and facilitates its operation and management.

The Wilson Sewing Machine Company have in their new machine reduced the number of both moving and stationary

parts to a wonderfully small number, and such parts as are employed are so disposed that little power is required to overcome inertia; the machine in consequence runs lightly and evenly, and may be propelled by steam or foot power at a very high speed.

The needle is driven in such a way that the power is applied to the best advantage as it enters the fabric. The shuttle oscillates in a very short arc, and enters and passes through the thread loop within a distance which, if measured in a straight line, would be less than twice the length of the shuttle. The bobbin carried by the shuttle contains a large quantity of thread, which on its course out of the shuttle passes through a very complete tension device.

Fig. 3.



TAKE-UP.

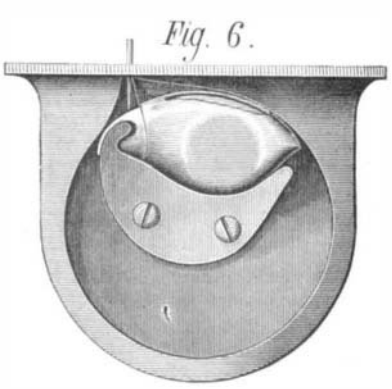
The machine has an adjustment by which it may be made to take the tight lock stitch for heavy goods and for leather, or it may be made to take the elastic lock stitch for light goods. The stitch is tightened after the needle leaves the goods, thus permitting the use of a finer needle than is employed by sewing machines that tighten the stitch while the needle is in the goods.

The well known Wilson feed, which works on both sides of the needle, is applied to this machine. It moves the fabric after the stitch is tightened, thus relieving the thread of unnecessary friction and strain and rendering it possible to operate successfully even with a poor quality of thread.

The take-up, which is shown in Fig. 3, is of novel construction, and is capable of casting off sufficient slack thread to enable the machine to sew upon fabrics one half inch thick as well as upon the most delicate goods.

The mechanism for communicating motion from the main shaft to the oscillating shuttle shaft, and also to the rotating feed shaft, is shown in Fig. 2. It is very simple and effects the two motions without gearing or cams, and we cannot imagine how it could fail in a lifetime. The arrangement of mechanism below the bed plate for moving the shuttle and the feed bar is shown in Fig 4. In most machines this is the hiding place of intricate cams, crooked levers, and unreliable springs. Here, covered and out of the sight of the purchaser, are usually found complications which would ruin a printing press or a steam engine; but in the new Wilson machine we find so few of the parts that have been considered essential to peculiar movements of the shuttle and feed, that we are almost surprised to see the machine turn out rapidly and quietly the most regular and beautiful stitches. The feed is operated by a cam which is clearly shown in the bottom view, and the shuttle is oscillated in a circular shuttle race by means of a peculiar shuttle carrier shown in Figs. 5 and 6.

Fig. 6.



SHUTTLE AND SHUTTLE RACE.

The shuttle race has a hinged and spring-acted door which holds the shuttle in the shuttle race, and also supports the spring which presses the heel of the shuttle only while its point is entering the loop. This arrangement of the spring insures the engagement of the point of the shuttle with the loop, no matter what quality of thread is used.

The shuttle, which is one of the most novel features of this machine, is shown in its place in the shuttle carrier and shuttle race in Fig. 6, and it appears in detail in Fig. 7. It has a complete tension device, carries a very large bobbin, and is very easily threaded. It is, in fact, what is known as a self-threading shuttle.

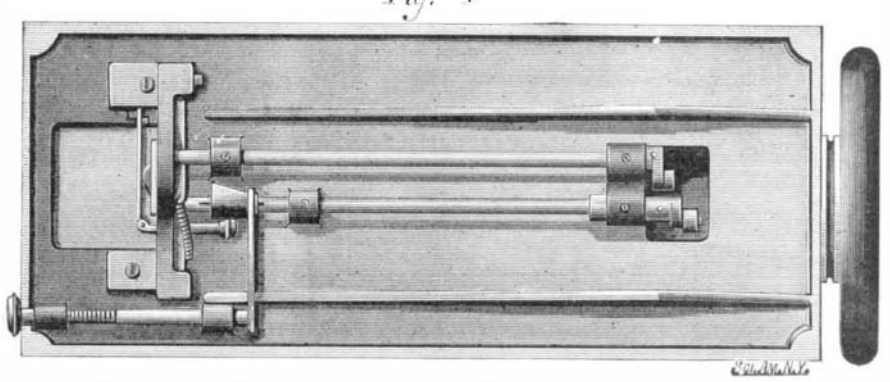
Fig. 1 gives the general appearance of this new machine. It is not only elegant in design and finish, but it is strong and of ample size for all purposes. The arm is 8½ inches long and 5½ inches high, and the belt wheels are arranged for two speeds, so that the machine may be readily adapted to heavy or light work.

The Wilson Sewing Machine Company, with the spirit which characterizes Western enterprise, have built up a large and prosperous business, which is conducted in one of the finest buildings in Chicago, and they are now reaping the benefits of placing the prices of sewing machines on a reasonable scale. It is a fact, not generally well known, that the Wilson Sewing Machine Company were the first to cut down high prices and to afford a first class machine at a fair price.

We understand that the new Wilson sewing machine, notwithstanding the improvements, will be afforded for the same prices as the old one.

At the manufactory at Chicago the new machines are being rapidly built, so that after January 1, 1879, the market may be supplied without delay.

Fig. 4

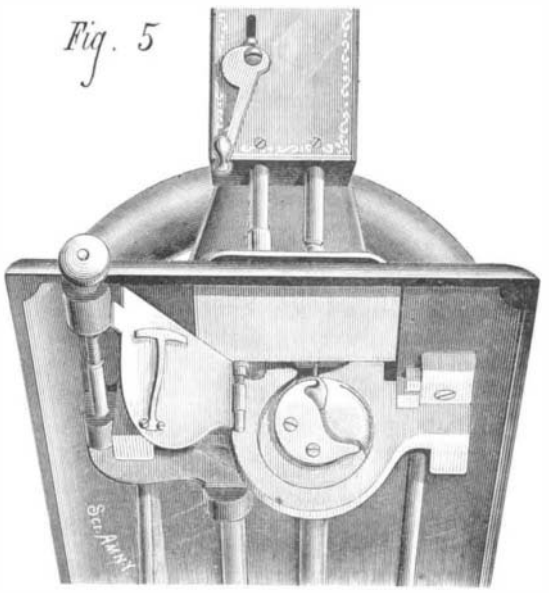


THE NEW WILSON SHUTTLE SEWING MACHINE.—BOTTOM VIEW.

### The California Tea Fields.

The London *Grocer* sees in the Great Sacramento Valley of California the future tea field of the world. It says: "A great deal has been said and written lately on the subject of the cultivation of the tea plant. We have had glowing accounts of the wonderful success of the Scotch planters in the beautiful island of Ceylon, the extent of their gardens, and the large yield they will be capable of throwing into the European market in the course of a few years. But very few persons are aware that there is at this moment a far larger tea field than the whole island of Ceylon doubled twice over, where Chinese and Japanese are arriving by thousands to cultivate the tea plant, and where the climate is so salubrious, and the soil so rich, that in the space of twenty years from now it is confidently anticipated that they will be able to supply the whole of the New Continent, and that the Americans will not only not have to send to China for one ounce of tea, but that they will be able in the course of time to send large consignments to Europe. And this too only a fifteen day run from Liverpool! We are now speaking of the Great Sacramento Valley, California. Thirty years ago the people of California did not know the meaning of wheat--no wheat was grown there then—while to-day that valley alone is supplying Great Britain and Ireland with more than one half of the bread which they consume. The valley is 450 miles long by 50 broad; where no rain falls, it is watered by heavy fogs, which roll in from the Pacific Ocean. Along the entire stretch of this valley run the Sierra Nevada, or, as they are more commonly termed, the Californian range of mountains. Here you can get any climate, rising from perpetual summer in the valley, higher and higher, colder and colder, till you reach perpetual snow on the top. It is along the base of this range of mountains that the Chinese and Japanese are now busy cultivating the tea plant with marked success. On a visit there, some nine months ago, the writer had the pleasure of tasting the product, and found it of excellent quality. Ten years ago the tea plant was unknown in America, and was introduced by mere accident during the time of the civil war. The government at Washington finding that they could not send troops to California—they could not march an army across the Rocky Mountains, for the Indians were hostile to them—they could not send them by sea for fear of such vessels as the Alabama—they therefore, under the advice and direction of the late President Lincoln, determined to construct a railway; and for this purpose, in order to hurry on the work—for the war was not yet over, and not likely to be—they encouraged two great railway companies to construct the line. One was to start from Omaha, on the banks of the Missouri, working West; the other was to start from San Francisco, on the Pacific, working East; and both some day were to meet; and in order to expedite the work the government granted the railway companies the land through which the line went for ten square miles on each side of the track. The company that started from the Missouri engaged 30,000 Irishmen; that which started from San Francisco, not to be outdone, imported 16,000 Chinese to compete against them. In 1869, when the railway was completed, it was found that some of the Chinese had brought their favorite plant with them, and that for the last five years they had been quietly cultivating it along the base of the Sierras. Having now nothing else to do, and not wishing to return to China, the whole of the 16,000 turned their attention to this branch of industry, and at present in the State of California alone the Chinese number over 120,000. The Great Pacific Railway, which they helped to make, runs through their tea gardens, a six days' journey to New York, over a distance of 3,500 miles, and thence per quick steamer to Liverpool; or they can send it to Chicago, on the banks of Lake Michigan, thence per sailing vessels through the great lakes, down the canal from Erie to Ontario, and out through the great river St. Lawrence to all parts of the world. The plant can be gathered, packed, sent to England, sold in Mincing lane, and consumed by the general public, all within one month; and the opinion is expressed, that within our lifetime the novelty will not be 'American meat,' but in all our grocers' windows 'Californian tea,' sixpence per pound."

Fig. 5



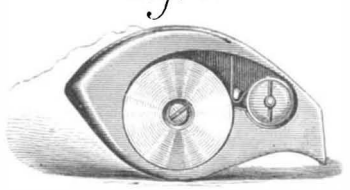
SHUTTLE RACE AND COVER.

It has been asserted that the cost of labor in this country must ever be a bar to the successful cultivation of tea. True, in China an enormous amount of hand labor is required in picking and curing the leaves; but it would not take many years of American invention to change all that. The man who makes the first successful machine for curing tea will confer a great benefit upon his countrymen, and make a good thing for himself as well.

### The Golden Cup Oak.

The golden cup oak (*Q. chrysolepis*) is a puzzle to botanists; and well it may be, since it occurs as a lofty forest tree and also as a tiny bush. Dr. Kellogg, of San Francisco, pronounces the dwarfed form a distinct species; but Dr. Englemann, of St. Louis, though the difference in size is so great, believes that one species includes both extreme forms. A California botanist, Mr. J. G. Lemmon, who has lately made an extended exploration of the High Sierra back of Yosemite, sides with Dr. Englemann, and says that on the various slopes about Yosemite and elsewhere in the Sierra, he has found specimens grading all the way from a tiny prostrate bush, loaded with small, smooth cupped acorns, to the tall, majestic tree, bearing yellow golden dust-covered acorn cups two inches across.

Fig. 7.



SHUTTLE.

### Future Rifle Shooting.

In a letter criticising somewhat severely the current style of rifle practice, the celebrated off-hand marksman, Dr. W. F. Carver, insists that his style of shooting is the only one worthy to be called practical. He believes, too, that it will soon become the prevailing style. He says:

"I am willing to acknowledge that what I do may be improved upon, and give as my honest opinion that in a few short years my shooting, considered so wonderful at present, will be child's play as compared with the skill which future generations will achieve. Some people call me a wizard and others a trick shooter, while others assert that I am peculiarly gifted: but the fact is the shooting I do has come from years of hard and constant labor. The hardest life a man can possibly lead is hunting upon the plains. Twenty-seven years of steady Western life, dependent solely upon my own exertions, has taught me what I really know of rifle shooting. Was not that life of all things practical, and in nature should it not produce practical results? I have hunted for the market many years, learning nothing of trickery or deception by my calling, and what I am about to say in behalf of my shooting I know from experience to be true. Why, my style of shooting is the very first principle and really the foundation of practical rifle shooting. All men who wish to become perfect in the use of either rifle or shot gun should commence by shooting at flying objects. It is very easy to hit an object thrown into and moving in the air, provided you point your gun at it. This may seem a foolish remark, and provocative of laughter by its simplicity, yet that is all that can be said, and is the secret of hitting anything with either rifle or shot gun, but more particularly with the rifle. In shooting at moving objects with a rifle a man soon learns to take deliberate aim, and to understand perfectly well that if he does not he will surely miss. This style of shooting makes a man handle a gun with the rapidity of lightning, and in a short time—or a few years—he does it with such ease as to make many call it 'trick shooting' or 'sleight of hand,' when in reality it is nothing but a degree of perfection resulting from practice. Many think I do not take aim. In fact, this has puzzled many theorists, and has been a point of considerable discussion. Those who think I do not take aim are mistaken. Should I not take aim I never would hit an object. Let any one practice my style of shooting with a rifle for a short time, with even moderate success, and then take up a shot gun, and for the first time in his life he will discover how easy it is to hit anything with a scatter gun, and, by virtue of the nicety with which he must draw his bead with a rifle, what perfect control he has of his shot gun; then, on the other hand, how easy it is for him to hit a moving object with a rifle almost any distance. There is no question but that my style of shooting will revolutionize the whole shooting world, and a scatter gun will ultimately disappear from the arena as a real test of skill, only to be used for hunting, and in the field for market."

### "Bruce," the Manchester Fire Horse.

Mr. A. Tozer, Chief Fire Station, Manchester, England, says: At the latter part of the spring of 1864, "Our Bruce" was born; he soon began to show signs of a very promising hunter, of over sixteen hands, and in due course commenced his training for the chase. At five years old he had grown to a beautiful animal, very docile and tractive—his mottled gray coat the pride of the groom and the admiration of his master. "Our Bruce," in the hunting field, once stumbled, and, in consequence, lost the confidence of his master, who disposed of him to the Manchester Carriage Company. In the early part of the year 1870 he was sold by the carriage company to the Manchester Corporation for the fire engine department, and commenced his duties on the 24th of March. His general appearance and kind, tractable, willing ways were soon noticed by the firemen, and in less than a month after he joined the brigade he was the favorite of the whole establishment, having pretty well the free run of the yard, in which he caused much diversion by his singular and funny ways. He was always full of innocent mischief, and one of his greatest delights was to chase the men about the yard. It sometimes happened that he was let out for a gambol when the children were playing. On such occasions it was most interesting to notice how careful he was in not going too near them. At other times, when the engines were in the yard, he seemed not to forget his early training as a hunter, and would amuse himself by jumping over the poles. When tired, he would lift the latch of the door and go into his stable, and just as easily, after a rest, when the stable door was closed, he would let himself out again, or knock loudly at the door to attract attention. Near the stable door there is a water tap with a revolving handle. "Our Bruce" would turn the handle with ease and help himself to a drink. It sometimes happened that a hose pipe would be attached to the tap; this would not cause him the least inconvenience; in such a case, after turning on the tap, he would lift up the end of the hose pipe with his teeth and hold the end in his mouth until he had satisfied his thirst. Many curious anecdotes could be told about our pet; how on one occasion he picked up the end of the hose and wetted one of the firemen who had offended him; how, at a fire, he would stand amid the greatest noise and excitement, with showers of sparks falling around him, and on his beautiful coat, only to be shaken off; and at other times completely enveloped in smoke; but there was no shying or fretting under fire or smoke with "Our Bruce." He seemed to know that he had brought those who would fight that ruthless tyrant fire, and he stood proud and confident that before long he would return home with the victors, when, after being refreshed and groomed, he would again be ready, always first, for the next "turn out."

For nearly six years "Our Bruce" never missed going with the first machine, at the end of which time he was, in consequence of his fine appearance, and our desire to give him a less active duty in his old age, transferred from the fire engine to the police patrol duty. We did not altogether lose our faithful animal's services, for one of his duties was to attend fires with the mounted police sergeant (whose name was also Bruce) to keep back the onlookers, which he most effectually did for nearly two years, during which time he was as great a favorite with the policemen, rarely leaving a police station without an apple, a piece of bread, or some mark of affection.

On the 7th June "Our Bruce" fell sick; the veterinary surgeon was sent for, who pronounced him suffering from inflammation of the bowels. The usual remedies were applied, and everything was done to relieve his pain and make him comfortable, but to no avail. For three days afterward he was never left for a moment, night or day, and at the end of the third day he drew his last breath, surrounded by those who loved him well, and who had been taken by him to the scene of many a hard fight. A *post mortem* examination was held the following morning to ascertain the cause of death. A stone (calculus) six inches in diameter, weighing five pounds eleven ounces, was taken from his bowels. This was, no doubt, the principal cause of the disease which led to the death of the fire horse, "Our Bruce."—*Science Gossip.*

### A Nail Gun.

The *New Zealand Times* says: "One of the most simple, and at the same time most ingenious implements on view at the Wellington Industrial Exhibition, is an invention of a young man in this city, a Mr. F. Falkner. It is called a 'nail gun,' and is used for nailing down flooring boards. We have seen the implement in use, and as far as we are able to judge it is quicker in its work and insures greater cleanliness than hand nailing could do. The apparatus is not unlike a gun in shape, and is about the same length. It is kept in position with the foot and knee, and the nail to be driven is placed (point down) in an aperture at the top of the concern. It slides down to the bottom, and then the operator draws up a rod, and by one downward stroke of this the nail is cleanly driven into the boards beneath. A practiced hand, by this simple contrivance, could do the work of half a dozen men. We believe that Mr. Falkner is now improving upon his invention, and is making a 'nail gun' which will be self-feeding. We have no doubt that when the implement comes to be generally known it will be brought into general use." [An instrument of this sort has been for several years in use in this country for driving carpet tacks.—EDS.

### Delicate Test for Water.

What is particularly wanted at the present day, and what has not yet been discovered, is a qualitative test which will at once determine whether or not a water is fit for dietetic purposes, and the introduction of such a reagent is the object of a paper by Mr. W. C. Stables in the *Pharmaceutical Journal.* The well known permanganate process is practically a failure, owing to the fact that potassic permanganate does not possess the power of oxidizing albuminoid matter; free ammonia is infallibly detected, while all the important "albuminoid" substances escape untouched. Convinced that potassic permanganate is the base of a very sensitive and delicate test, and that it only requires a little modification to develop it, Mr. Stables began experiments with a view of finding a reagent that would act upon the nitrogenous matter, and bring it under the influence of the potassic permanganate. For this purpose he found that potassic hydrate could not be excelled; and that 4 parts of this, with 1 part of potassic permanganate and 160 parts of freshly distilled water, made the best solution. With such a solution he has made various comparative experiments. One minim, placed in a test tube of distilled water, remains of a beautiful pink hue for several days, but the minutest trace of egg albumen in the same quantity of water will be infallibly detected. He states that he has now used this test for some time with most constant results; that is, that if, on the addition of a minim of this solution, the water in a few hours gives a brownish precipitate with loss of color, he has invariably found such water to contain an abnormal proportion of organic matter, so much so as to be injurious to health.

### The Polarization of Electrodes.

At a recent meeting of the French Society of Physics, M. Lippman presented the result of his studies and experiments on the polarization of electrodes; from these he has been led to lay down the following as a law: A metal can be completely depolarized only in its own salts. For instance, a silver wire previously polarized remains polarized in solution of cobalt, copper, etc.; it can be depolarized only in a salt of silver in solution. From this law there will perhaps result a new method of chemical analysis; we may be sure, for example, that a solution contains copper if a copper wire cannot be polarized in it by the passage of a current. M. Lippman estimates that by this means the presence of $\frac{1}{50\,000}$th part of copper may be detected in a solution containing other salts, provided, of course, that the copper itself has no action on the latter.

### Milk-weed Juice for Raw Surfaces.

About a year ago, Dr. G. F. Waters made the discovery (to which we have before referred) that bicarbonate of soda, if applied to a burned or scalded surface, had the property of promptly subduing the pain. To prove the truth of his discovery, he performed the bold experiment of severely scalding himself all around his wrist. The application of the soda at once relieved the pain, and if the doctor had not been careless the burn would have been cured in a week; but he unfortunately allowed his cuff button to catch and tear the blistered skin, and the edge of his cuffs to further irritate the wound by friction. The result was a suppurating wound. Studying the subject, Dr. Waters thought that possibly vegetable albumen might answer the same purpose that animal albumen is supposed to in the formation of dermal scales. He proceeded, therefore, to test his theory by removing the scab from a portion of the wound, drying the surface with blotting paper, and then at once applying the white juice of the common milk-weed (*Asclepias cornuti*). Space after space of the sore was thus treated, each portion being allowed to heal successively before the next part was tried. The time of healing varied from twenty-four to thirty-six hours, according to the depth of the sore; but in each instance new skin formed completely across. In regard to this new discovery, the doctor states that the only essential point is to dry the wounded surface gently and thoroughly with blotting paper before applying the juice of the milk-weed.

### Life without Air.

The *Journal für Prakt. Chemie* gives a detailed account of experiments instituted by Professor Grunning, of Amsterdam, to settle the question as to the ability of bacteria to exist in media free from oxygen, a doctrine which has been warmly advocated by Pasteur. He made use of ferrocyanide of iron as an exceedingly delicate test for oxygen, and by the use of this reagent detected oxygen in the apparatus and media which are generally employed for cultivating micro-organisms, and which have hitherto been supposed to be free from air. The experiments consisted in inclosing in glass tubes easily decomposable substances, such as raw flesh, green peas, etc., infecting with a drop of a mixture of decayed peas and white of egg, which contains nearly all varieties of bacteria, and closing the tubes by fusion after carefully freeing entirely from oxygen. The sealed tubes were exposed to a temperature of about 100° Fah. A considerable number of such vessels have been kept two years without the contents having suffered any change, as, on opening, they were found to retain their original freshness. The result of these experiments appears to show, contrary to Pasteur's views, that by the exclusion of oxygen bacteria are completely destroyed, and putrefaction, being arrested, does not continue afterward on the admission of filtered air free from bacteria.

### Cadaver-Poison of the Australian Natives.

According to Taplin, the inhabitants of the lower Murray district of Australia, who are comprised under the name of Narrinjeris, make use of a most destructive and terrible poison for killing their enemies, namely, the specific animal poison developed in human corpses. The instrument used for inoculating an enemy with it is called *nieljeri.* The natives state that they obtained the knowledge of this poison from the inhabitants along the upper Murray. It has at present become a most destructive weapon in the hands of the natives, who adopted it with so much the more eagerness as their former belief in charms is gradually dying out. The practice of the nieljeri is very much facilitated by the fact that the natives do not bury their dead, but preserve them above ground. Into such a corpse the point of a spear, consisting of a sharp-pointed piece of human bone, six to eight inches long, is inserted. Then a bunch of hairs or feathers is saturated with the fat of the decomposing body, and tied about the pointed bone. This apparatus is the nieljeri. With it the murderer stealthily approaches his victim, slightly scratches the skin with the sharp poisoned point, and, if undetected—as often happens in consequence of the narcotic sleep of the natives after one of their gigantic meals—he steals away unsuspected. Soon the terrible effects of the cadaveric poisoning make their appearance, and the person generally dies under the most excruciating pains.

### Milk Cure for Lead Colic.

A remarkable case is given in the *Journal de Médecine* of the effect of the habitual use of milk in white lead works. In some French lead mills it was observed that in a large working population two men who drank much milk daily were not affected by lead. On the general use of milk throughout the works, the colic entirely vanished. Each operative was given enough extra pay to buy a quart of milk a day. From 1868 to 1871 no cases of colic had occurred.

We had not before known of this remedy, but, some years since, on questioning certain workmen who were engaged in the manufacture of red lead or minium, we learned that each one secured immunity from colic by drinking a pint of olive oil per diem.

FRENCH directions for the use of a domestic dye:

To dye by yourself without preparation.

This is an English translation of a French circular given to people passing in the Exhibition.