Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

Tea Culture in the South.

MESSRS. EDITORS:—An article in your issue of December 22d, induces me to send you my experience, etc., in the tea culture. During the war I was living in Fayetteville, N. C., and there tried the tea plant with success. The general soil of that section is sandy, with an understratum, more or less deep, of clay. The seeds I planted were old, but they sprouted well, and in March, 1865, I had over a hundred fine plants, averaging eight inches in hight. At that time my fence was destroyed by the accidents of war, and I paid but little attention to the plants until June, when I found many still flourishing. Dr. Saml. J. Hinsdale, of that place, transplanted them to his garden. He has now many fine large shrubs of the tea tree, and has prepared tea therefrom. The soil of that section is well adapted to the growth of the plant, and land can be bought there very cheap. I presume Dr. Hinsdale could give more full information of his own experience. I know that the seeds were distributed by him, and that dozens of persons planted them with success.

Dr. Smith, near Greenville, S. C., spent much time and money experimenting with the tea plant, but I do not think the soil he had to deal with so good as that further south and east. He, however, said that good tea could be produced there at a comparatively small price. There is no doubt that thus growing the plant is the only way it can be had pure.

On the eastern shores of North Carolina grows wild a shrub tree called Yopon—name no doubt derived from the Yeopim Indians—to which botany has given the name *Ilex Euponia*. It is very similar to the Matte (*Ilex Paraguayensis*) of South America. It is crudely cured and used as a tea by the poorer classes and boatmen. Its chemical properties are similar to black tea, while its medicinal are superior. As a sedative in fevers it has no equal. In excess, it acts on the liver and also produces vomiting. The leaf is of the same shape and size as Chinese tea, and from appearance no one can tell any difference in the two plants at eight or ten inches hight. When full grown and large I think the yopon has a slightly thicker leaf; but of this I am not a fair judge, as I have seen yopon shrubs fifteen feet high, while I have never seen a Chinese tea plant more than two feet in hight. I have no doubt but with equal care the wild shrub of North Carolina would make a tea as good as ever came from China, while, too, I have no doubt much of the "pine barrens" of eastern North Carolina might be made to yield an immense profit, cultivated in tea plants. Thousands of acres of such land, from which the turpentine has been worked, can be bought for 25 or 50 cents an acre, while much equally fit for corn, etc., with turpentine and timber trees, can be bought at from $1 to $3 per acre.

Brooklyn, L. I. H. E. C.

Saws for Sawing Metals.

MESSRS. EDITORS:—As your readers have lately been instructed how best to treat circular saws for the purpose of sawing wood, perhaps you would not be averse to give those of your readers who deal in metals an opportunity to give the results of their experience in the use of circular saws for sawing metals.

I have lately had occasion to saw from round brass bars seven eighths inch diameter a large number of pieces half an inch thick. To do this expeditiously, I constructed a circular saw of 3 5 inches diameter, 10 teeth to the inch, to which I gave 6,440 revolutions per minute, equal to 1,064 per minute at the cutting edge. At this speed I succeeded in sawing about 100 pieces per hour; two thirds of this time, however, was consumed in grasping the bar after each cut, close to the new cut, and in filing the saw. I found it necessary to keep water dripping on the edge of the saw to prevent heating, and had to sharpen frequently. The use of water I believe to be unnecessary if the saw were properly made. My saws were made of No. 18 sheet steel. They were hardened by being rapidly placed when red between two blocks of smooth iron; the temper drawn from the center as usual: this was the only way I could prevent warping. The temper, however, was always uneven and the corners of the saw teeth were frequently destroyed.

How should and how can such saws (of No. 24 steel if possible) be made to have clearance of teeth, even temper, and true surface?

I am aware that circular saws are used for the purpose of sawing iron; as for sawing rails, for instance. I have used circular sheet iron disks without teeth, run at high velocity, advantageously as saw blades for thin pieces of iron, and steel blades with teeth, at low velocity, to saw the slot in screw heads, etc. Will you or some of your readers familiar with the subject publish their experience in this line for the benefit of probably thousands of your readers. EUGENE BANDEL.

Benicia, Cal. Dec. 13, 1866.

Petroleum as a Lubricator.

MESSRS. EDITORS:—We all remember the prejudice that petroleum encountered in its introduction as a burning oil. But there was no denying the splendid light it made, and hence it triumphed. The heavy petroleum has encountered less prejudice as a lubricator, but still it meets with opposition from many machinists and engineers, greater perhaps in the East than in the West. Can any of these engineers give a consistent reason for this opposition? Said an engineer to me, "We *don't like* it so well as lard or sperm, but admit it is cheaper, and in winter will not freeze on a locomotive." When asked the ground of his dislike, after conceding its cheapness and utility, he could only plead its color and smell,—a mere matter of taste, that the stockholder in a railroad cares very little about. This prejudice is encouraged of course by refiners and dealers in manufactured and other oils, who besiege the master mechanics of railroads, and other great consumers, with every variety and quality of oils, half of which are worthless.

Some machinists will say, however, they have tried the earth oil and found it *gritty*. They were simply unfortunate in their purchase, just as they often have been in buying other oils. Earth oils vary in quality, and it is to be regretted that dealers in the cities do not identify better the wells they buy from, and establish the reputation of those that stand the test of use, and throw out those that do not. But they seem to note only the gravity. Some wells do produce a gritty oil. The large wells on White Oak Creek, West Va., produce an oil less pure than the small wells that pump some water. This oil is now being clarified with success. The Ohio lubricating oil varies least, and is the purest produced. These wells are all small, and pump from twenty to five hundred parts water to one of oil. This is true of the Muskingum wells, and indeed of all Ohio wells within my knowledge. The oil, also, appears to be intrinsically of finer quality, of a darker green, and less pungent odor. The production however is limited, and notwithstanding, owing to the want of discrimination as to quality in the market, it suffers in price except with those who know the difference in quality from use. The same discrimination used in the purchase of other oils, will secure a pure earth oil.

There have been many comparative tests of petroleum made, and all in favor of the earth oil. The most accurate and systematic, perhaps, were made by the Michigan Central and the Boston and Union railroads. The former showed that petroleum is 38 per cent cheaper than whale oil; the latter, that the consumption was 20 per cent less in quantity in going 19,000 miles. The captain of a steamboat who had used the Ohio oil for years, told me his experience proved one barrel of it equal to two barrels of lard oil, while his machinery was always clean and ready for use, no matter how long his boat was laid up. In fine, I have observed that after prejudice is worn off by its use, engineers invariably pronounce petroleum the most economical oil. Its price is now so much less than all other oils, there is every inducement for railroads and other great consumers, not to mention the smaller ones, to give it a fair trial. MECHANIC.

Tempering and Sharpening Steel.

MESSRS. EDITORS:—Tempering a tool consists commonly in giving it a hardness greater than required, and then softening it by again bringing the metal to the action of the heat. This heating is variable, according to the softness required, and steel possessing then the faculty of covering itself with a very thin stratum of oxide of iron, the color of which varies with the degree of heat, the mechanic wants only to follow the indications of the thermometer for operating surely.

At 430° F., pale yellow; 470°, gold yellow; 490°, brown; 510°, purple; 550°, bluish; 570°, indigo (blue); 610°, water green. Hence the expressions, to "heat to a blue," etc.

As proved by your correspondent "I. E. E.," the stratum of colored oxide is of no consequence to the temper. He removed it with diluted acid, and the former elasticity remained. He, like correspondent "E. P. W.," found that loss of elasticity resulted from the polishing and grinding of blades. The softening proceeded from the heat occasioned by grinding and polishing. By heating your blades again, you temper them more and more. By sharpening and using the tools, a great amount of heat is developed, and little by little the tools lose their hardness.

I have seen many good carpenters, who rejoiced in having a planing-knife a little hard. "It will soften by use," they would say, and with reason, although perhaps not knowing why.

For grinding, the stone should be dipped in water to prevent the heating of the tools; and careful cutlers use oil for polishing, instead of water, when using grindstones of small diameter.

Never follow the example of the street knifegrinder. He does much work, and cheap work. He uses as little water as possible. You give him a good razor or a good knife, and he gives it back to you well sharpened, but a spoiled tool, which needs to be hardened anew.

Therefore, when sharpening your tools, take large stones with much water, and make slow and good work.

MECHANIC.

Place of Piston when Crank is Vertical.

MESSRS. EDITORS.—On page 423, vol. XV. of the SCIENTIFIC AMERICAN, you have given from the pen of P. H. Vander Weyde, M. D., etc., about one-third column of spiteful, uncalled-for and out-of-place observations on my mathematical knowledge (which few of your readers care about) and charge also that my ignorance has led me into an error, when the truth is, that the error is with P. H. V. W. and not with me. I trust you will allow me a little space to defend myself as briefly as possible.

On page 268, P. H. V. W. gave a rule which he says is the *true* rule. "Call the length of *piston rod*, m, and the *crank*, n, then the distance of the piston to the opposite end of the cylinder will be represented by this expression, $m+n-\sqrt{m^2-n^2}$.

He also puts it into words as quoted below, and as he says in the simplest form. "Take the square root of the difference between the squares of length of *piston rod* and crank, and subtract this difference from the sum of these lengths: the result will give the distance of the piston from the extreme end of the cylinder." If there are any grammatical errors in the above rules they are not mine. He adds also, that any persons understanding elementary geometry may easily demonstrate this rule. I (not being of that class in his opinion) feel competent to demonstrate the fallacy of it.

Now take his rule quoted above, and apply it.

Take the stroke or length of *piston rod*..... 4
Length of connecting rod..... 8
Length of crank..... 2

As, according to this rule, the connecting rod does not enter into the calculation, it does not matter what its length is, and the result will be that the distance moved, $= 4+2-\sqrt{16-4}$, $= 2.534$. And so in every imaginable case of varying lengths of connecting rod where the lengths of *piston rod* and *crank* remain the same, his rule must produce the same result, as I said in my former communication. He now puts forth a different rule, which I have nothing to say about, but I think if he would propose the rule above quoted to some of his old scholars, whom he taught in such a straightforward manner, and who, I suppose, never "went back" on their teacher, they might possibly convince him of his error, if he will not believe his own eyes. He speaks of an error in my calculation. If you have my manuscript (of which I have a copy) you will find that 2.265 is an error of the press, as I put it 2.254, and if you or your readers will take the trouble to apply his rule, quoted above from page 268, you will easily see that he is wrong. P. H. V. W., on page 268, signs himself simply M. D. He professes a great deal. It is very common for persons to take pleasure in telling what they once were, but in very many instances it would be better to bury the past: therefore, to show him a good example, I will only subscribe myself,

HENRY W. STEPHENSON, *now* Tinner (or Tinker),
No. 30 W. 5th St, Cincinnati, Dec. 26, 1866.

[The communication to which our correspondent refers, was not in good taste, but we did not feel at liberty to alter its general wording. We permit Mr. Stephenson to reply, and with this the controversy must cease, so far as our columns are concerned. We are flooded with articles on the "position of the piston when the crank is vertical." We cannot publish them all, and will reserve one of the number, from a naval engineer, for future use.—EDS.]

Modern Medicine.

MESSRS. EDITORS:—In a recent issue, you make some sensible remarks on modern medicines. I wish to add a few remarks on the dual action of medicines, which will explain a good deal of what appears to be conflicting in the different systems. It is well known that many medicines have directly opposite effects on the human system, in different doses.

To make this clear, take for illustration the effects of some common remedies, as opium, calomel, tartar emetic, and alcohol in its various forms.

You may produce a stimulant, exhilarating effect with a small dose of opium, and you can produce a contrary or sedative effect with a large dose.

A large dose of calomel causes free discharges from the bowels; a small dose will check diarrhea. A given quantity of tartarized antimony has an emetic effect; a smaller quantity will check vomiting.

A small quantity of alcohol is stimulant; a large amount is stupifying. And this will hold good throughout the *Materia Medica*.

It is evident, then, that you may practice medicine successfully with either set of doses. You may open the bowels with calomel or opium, and you may check diarrhea with either calomel or opium. An Allopathist would use the large dose of calomel to open the bowels; a Homœopathist would use the small dose of opium to produce this effect. The Allopathist would use the large dose of opium to check diarrhea; the Homœopathist, the small dose of calomel.

As usual, there is truth on both sides of the line. A sensible physician will prefer the small doses as a rule, but large ones may be eligible sometimes.

Jahr's Manual is an excellent text-book for the practice of Allopathy, because it shows the full effects of large doses on the human system. As to how much is a dose, I leave the doctors to decide. Respectfully,

W. F. QUINBY, M. D.

WILMINGTON, Del.

[When we wrote the article on modern medicine, page 391, last vol., to which Dr. Quinby refers, we did not propose to open the subject for discussion. The facts, however, stated by him are generally worth knowing: with this we close the subject.—EDS,

Water Spouts--Western North Carolina Mountains.

MESSRS. EDITORS:—I have read with pleasure the interesting letters in your valuable journal from "D. C." (David Christy, Esq., I suppose). An authority, too, upon the subject he treats, and those analogous to it, as good as any in the United States. I know that his observations, especially in the Southern Alleghanies, have been practical and thorough. The phenomenon exhibited at Clayton, Ga., I have witnessed at Hickory Nut Gap, on the road from Asheville to Rutherfordton, and at other points in the mountains of Western North Carolina. One of the most singular and useful effects of fog and air currents is exhibited yearly on Tryon Mountain, in Polk county, near the upper waters of the Saluda River. There frost is never known, and the peach crop never fails. In my investigations in Western North Carolina, I found similar mountain sides in other counties, where, for instance, the leaves are untouched by frost for many days later in the year than those adjoining.

Waterspouts I have frequently heard of and had the *pleasure* of being in a small one. On the French Broad River above the Warm Springs, can even now be seen the traces of one by which a boulder containing at least 1000 cubic feet, was carried from the top of the mountain about 400 yards down

into the bed of the river. The track of the spout was about thirty feet wide. It occurred many years ago, and one of the old settlers told me it was accompanied by a great wind and noise. In Haywood county there is a singular split in the top of a mountain, said to have occurred about the same time. I visited the track of one on an old road leading from the Warm Springs to Tennessee. Just where the spout crossed, the road had been treated with poles on the corduroy plan. In their place was an immense ditch, while some of the poles were to be found in trees far below. One of the neighbors describing it said, "the spring branch was as big as Broad River." I learned also that they were frequent there, and the road, though the best and shortest to Tennessee, had to be abandoned for that reason. The formation of the gap above was similar to that described by "D. C." at Clayton and on the north-east side (in Tennessee, the State-line, apparently straight on the map, runs with the Unaka Ridge, hence is zigzag) was a farm noted for its peaches and grapes. I tried both myself when none were to be had anywhere else for sixty miles around. I shall not occupy your valuable space with any theories as to the frost-line or fog and air currents. The latter has been well and no doubt will be fully treated by "D. C.," and I know more ably than I should: but there are peculiarities of formation and location in the mountains of Western North Carolina, which especially fit them for the culture of the grape. I know by observation, and it has been demonstrated by others in practical experience. One of these peculiarities is in many points a total absence of frost, or, as some term it, the existence of a line of altitude above which frost has never been known. The seeming mystery is plainly solved in the action of fog and air currents similar to that so well described as existing at Clayton, Ga. In one point I think D. C. is incorrect: the term is not Ball but Bald, from the utter bareness or absence of any tree-growth. The Indians viewed these bald peaks with a religious reverence. My own opinion is that they had an origin in fire, and as the practice of burning the woods is yearly becoming less common, they are decreasing. Another theory is that they are caused by the fierce, cold winds which sweep the elevated and exposed points. Still I have seen points equally high in the immediate neighborhood covered with trees. Some of the Indians call them "Devil's tracks."

The Warm Springs region is one of peculiar interest to scientific men. The water of the Springs has a temperature of 104° Fahrenheit, contains sulphur, carbonic acid gas, and traces of some other minerals. They are located near the junction of the limestone and metamorphic slates. As a mineral region the country has never been well explored; lead, silver, and copper are plenty, iron of the best quality abundant; a large mass of corundum opens a few miles from the Springs, and I was shown a sample of cinnabar which was said to have been obtained from a creek about fifteen miles from the Springs, The scenery is wildly grand and beautiful, and were the river but navigable its fame would be world-wide. A railroad from Greenville, S. C., via Asheville, N. C., to some point on the East Tenn. and Va. R., has for years been chartered, also an extension of the Wst. N. C. R. R. to a similar point. One will be built, surveys have been made and some grading done. The Springs are located on the French Broad River, twenty-four miles from Greenville, Tenn., on the East Tenn. and Va. R. R. H. E. Colton.

Brooklyn, L. I., Dec. 27, 1866.

[For the Scientific American.]

Graphite—Plumbago.

In addition to our communication on this mineral—vide page 388, last vol. Scientific American—we will give some further statements in relation to the same subject.

According to Percy, the value of the graphite does not depend upon its purity, but upon its grain and texture, for the crystallized graphite of Ceylon, in which only from 1·2 to 6 per cent of foreign ingredients exists, is not fit for pencils; while the black lead from Borrowdale, in England, with thirteen per cent of impurities, has been found to be very well suited for their manufacture. For the making of pencils, only a compact, grainy kind is suitable; while for crucibles, the loose mold, with graphite appearing in shiny scales, is preferable. This kind generally occurs with an enormous amount of mineral matter, unequally diffused through the mass, and producing thus, even in small hand-pieces, respective differences in its specific weight.

The most valuable kind of graphite is, of course, that which is applicable for the manufacture of pencils; but it is seldom found. The graphite of Borrowdale, above referred to, is sold monthly by auction, at a place from 35 shillings to 45 shillings a pound. According to Ure, the net produce has in the six weeks annual working of some years amounted to 30,000 or 40,000 lbs. At the last World's Fair in London there were samples exhibited from Liberia, which were said to be still more valuable than the Cumberland graphite. In 1863, a process of preparing black lead was described by Brodie, which is said to produce a material adapted to all those purposes to which, thus far, the best and most expensive plumbago has alone been applicable.

Graphite is extensively used in making crucibles for melting the precious metals and in jewelry manufactories, as well as for melting bronze, steel and iron in small quantities. The crucibles of Passau, Bavaria, are much in demand, but they are now of an inferior quality, compared with ten or twenty years ago, when they could be used for thirty operations, while at present they do not stand more than eight or ten. The material from which those crucibles are made does not properly bear the name of graphite—it is gneiss, containing only 48 to 35 per cent of graphite. First it is reduced to a fine powder, then mixed thoroughly with one half or one third of its weight of clay, formed to a paste and stamped into forms or worked like earthenware. The product is not burned, but only exposed to a moderate heat until perfectly dry.

Until twenty years ago England supplied all its wants in this article by importation from Germany. Now it produces its own, and even competes with Germany, by importing the graphite from Ceylon. In 1862, 2,084 tons of plumbago were shipped from Ceylon, and of these not less than 1,736 tons were brought to England. Most of this quantity is probably used by the Patent Plumbago Crucible Co., at Battersea, near London, who also employ the Stourbridge clay: but as very much depends upon the proportion in which it is mixed with the black lead, this proportion is kept a secret. Still, it has been found by analysis, that their crucibles contain 52.6 per cent of carbon, 45.4 per cent of earthy matter, and 2.08 per cent of water. We may mention further, that in 1862, the price of the Ceylon graphite was £10 sterling per ton, and that at present it is £25.

Besides the uses above mentioned, plumbago is employed for portable chemical furnaces, muffles, retorts and tubes for chemists. Mixed with soft soap and lard oil, it forms a very good lubricator for gearing.

Graphite is generally considered as an allotropic state of carbon. It has also been regarded as a carbide of iron, for the reason that it is mostly found in combination with iron. It has only recently been advanced by a French chemist that graphite must be considered an elementary substance. It has been obtained artificially, by slowly cooling gray cast iron which was overcharged with carbon, and dissolving the mixture in aqua regia; a crystalline body of a metallic lustre, and identical with the natural graphite, remains in the liquid; and lately Paula observed its formation from the cyanogen compounds in the preparation of caustic soda. Lead.

Patent Dredging Machine.

"A patent has been issued to McClintock & Scott, of New Orleans, for a dredging machine, upon recommendation of Gen. Humphreys, Chief of Topographical Engineers, United States Army, that the same is necessary for the prosecution of improvements at the mouth of the Mississippi."

[We find the above in the *N. Y. Times*. There must be some error about it—patents can only be legally granted for new and useful inventions, and not upon the mere recommendation of some party interested.—Eds.]

Artificial Stone.—Sand mixed with a solution of silicate of soda, is reported to make a stone of unequaled hardness. It can be cast into any form and of any tint, while soft; and when laid in cement of the same, may be said to produce an almost imperishable structure of solid rock. A company is manufacturing it in Chicago.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

Log Carriage for Saw Mills. A. M. Beard, Hillsboro Bridge, N. H.—This invention consists in certain new and useful improvements in log carriages, whereby the log is secured and handled in an easy and rapid manner, and also in an index of novel construction, which determines without calculation the point where the saw should enter the log in making the first cut, saving time and labor.

Butter Mold.—H. W. Hopkins, Milford, N. H.—This invention relates to the construction of butter molds of steatite or soap stone.

Burglar Alarm.—George A. Colton, Adrian, Michigan.—This invention relates to an attachment for doors, which attachment is of such a construction and arrangement of parts that, when the door is opened, an alarm will be sounded.

Hanging of Mirrors and Looking Glasses.—W. C. Cumming, Peekskill, N. Y.—This invention consists in so hanging or suspending a mirror that it can be not only lowered or raised in hight, but also brought to any desired inclination at pleasure, and set or sustained in such positions.

Tag or Label Card.—N. H. Bruce. Forge Village, Westford, Mass.—This invention consists in securing the cord or line to the tag, by first nipping and fastening the cord in a hollow metallic tube, that is then secured to the card or tag at one of its ends, by folding such end over the same, and glueing or otherwise cementing or securing the whole together.

Button Hole Cutter.—Charles N. Cutter, Worcester, Mass.—This invention consists in so constructing the cutter that it can be adjusted with the ut most accuracy and readiness to the cutting of button holes of different sizes

Grinding Mill.—Charles Clifton, Jersey City, N. J.—This invention relates to machines for the grinding or pulverizing of paints, ores, and other minerals; and it consists principally of a revolving hollow cylinder tapering from end to end, in combination with a stationary crusher or grinder, the two being arranged and combined together in such a manner that an efficient grinding mill is obtained.

Steam Boiler.—W. D. Andrews, New York City.—This invention consists of a boiler having a fireplace extending over its entire horizontal area, with the exception of a narrow water space surrounding it, and a series of tubes, whether one or more, passing horizontally through the water space, above the fire place, where the said fire place and the said tube or tubes are connected by, and communicated through, a combustion chamber formed outside the boiler, having openings, adjustable or otherwise, for the admission of atmospheric air thereto, and an opening or openings passing through the water space surrounding the fire place, and communicating with the latter.

Sheep-skin or Other Mittens.—A. P. Smith, Sterling, Ill.—This invention consists in cutting the sheep-skin of which the mitten is to be made, in sections, and then sewing up the facing with the mitten, as its several sections are sewed together.

Alarm Gun.—Albert Johnson and S. E. Allen, Raleigh, N. C.—This invention relates to an alarm gun with which persons may be warned of the approach of burglars or thieves—the gun being susceptible of being so set or adjusted as to fire in any direction.

Wagon Jack.—Geo. F. Graves, Mt. Upton, N. Y.—This invention consists in the combination with each other of a lifting lever having a bifurcated end, a toothed locking bar, and a standard, whereby a simple and efficient jack for raising the axles of carriages while lubricating or removing the wheels, is obtained.

Wringer for Clothes, Mops, etc.—Charles E. Gage, Fond du Lac, Wis.—This invention relates to a novel constructed wringer, especially designed for wringing out a mop, although it can be used for wringing clothes to much advantage.

Chemical Preparation for Preserving Butter and Meats.—Wm. Ross, Day's store, Pa.—This invention consists in a chemical preparation intended for the preservation of butter, to prevent its becoming strong and rancid; of fresh meats, to prevent putrefaction, and to prevent the same from receiving a salty and strong taste when preserved by salt only.

Clamp.—Wm. Strevell, Jersey City, N. J.—This invention relates to a clamp especially intended for use in connection with machines for the stretching of leather, in the manufacture of machine belting or banding, although it can be applied for other and various purposes.

Boots and Shoes.—M. Evans, Russiaville, Ind.—This invention relates to the manner of lacing boots or shoes, and it consists principally in so forming the boot or shoe that it can be laced or buttoned up in front in lieu of behind, with the utmost ease and convenience to the person wearing the boot or shoe and with one third less lacing at most.

Harvester.—V. W. Blanchard, Bridport, Vermont.—This invention relates to a new and improved arrangement of gearing for varying the speed of the sickle as circumstances may require. It also relates to a new and useful improvement in applying the driver's seat to the machine, and in the application of springs to the machine as hereinafter fully shown and described, whereby the draught and movement of the working parts are rendered more uniform than hitherto. The invention also relates to an improved manner of attaching the cutter bar to the machine, and also an improved manner of attaching the platform to the machine, whereby the former may be readily detached when necessary; and, lastly, the invention consists in an improved grain-discharging device.

Spindle Stop.—Francis A. Sterry, Canton, Mass.—The object of this invention is to provide a simple and effectual method by which the stops of upright spindles and shafts may be frequently and sufficiently oiled automatically, and the invention consists in a peculiar-formed cup attached to the ordinary stop box.

Weeding or Hand Hoe.—C. A. Rose, Columbus, Ga.—This invention has for its object to furnish an improved hoe, the blade of which is removable from the eye, and is so formed that when one side or edge becomes worn it may be removed and reversed so that one blade may last as long as two ordinary hoes.

Ladder.—F. W. Hovey, Boston, Mass.—This invention has for its object to furnish an improved ladder for use in situations where the inclination of the ladder may be varying constantly or may be varied occasionally.

Bob Sleigh.—William M. C. Matthews, Summer Hill, Pa.—This invention consists in pivoting the bolsters to the bobs of the sleighs, for the purpose of preventing the said bolsters from moving backward and forward, when the ends of the bobs go up and down.

Toy Wind Wheel.—Max Miller, Brooklyn, N. Y.—This invention has for its object to furnish a simple, cheap, and amusing toy for children.

Mop Wringer.—A. J. Robinson, Troy, N. Y.—This invention has for its object to furnish an improved means by which a mop may be wrung without its being necessary to take hold of it with the hands for that purpose.

Broom Head.—Thomas B. Carroll, Noblesville, Ind.—This invention has for its object to furnish an improved broom head so constructed and arranged that it may be light, strong, and easily made, and which cannot mar or injure the furniture by coming in contact with it in sweeping.

Scaffold.—D. D. Adams, Brookline, Mass.—This invention has for its object to furnish an improved scaffold for use in repairing the tops of chimneys, simple in construction, easily raised, lowered, or adjusted upon a chimney and which can be closely packed for storage or transportation.

Iron Post for Wire Fence.—B. S. Haviland, Fort Dodge, Iowa.—This invention has for its object to furnish an improved iron post for wire fence, simple, cheap, light and durable.

Grain Dryer.—Archibald H. C. Barber, Clinton, Ill.—This invention has for its object to furnish an improved grain dryer by means of which grain may be thoroughly, evenly and quickly dried.

Fruit Box.—Eli Secor, Lawrence, Mich.—This invention consists in forming a box for the transportation and safe keeping of small varieties of fruits, as berries, etc., by combining a number of trays together in such a manner that they are easily separated, and in which the fruit may be safely kept and transported from place to place.

Automatic Grist Alarm.—Michael W. Helton and James H. Redfield, Bloomington, Ind.—The object of this invention is to provide means by which the miller in custom grist mills may be notified at what time the bags should be changed from one grist to another, so that each customer may get the flour or meal from his own grain.

Sad Stone.—H. W. Hopkins, Milford, N. H.—This invention consists in adapting a steatite sad stone to different kinds of work, as ironing and polishing linen and other articles by affixing to it a reversible handle.

Saw Mill Carriage Roller.—William Herrick, Northampton, Mass.—This invention consists in forming the journals of saw-mill carriage rollers of such a shape that the roller and the journals can be cast in one piece, and all lateral motion in the roller and in the carriage which rests upon it be prevented.

Log Adjuster.—Samuel Bristow, Bedford, Ind.—This invention consists in arranging shafts with drum and wheels on them, in such a manner that with a lever, pulley, rope and chains one man may be able to handle saw logs with ease.

Materials for Roofing, Siding and Covering Buildings, etc.—C. J. Fay. Hammonton, N. J.—This invention relates to the use of paper, made of manilla, hemp or grass, for the roofing and siding of buildings, and as a covering or roofing for the tops and sides of cars, decks of vessels and carriages, either upon the inside or outside of the same or both, and for the purpose of awnings or shades or for any other purpose where it is desired to render the surface on which the said paper is used waterproof, or, in other words, impervious to moisture or the air.

Sash Fastening.—Robert Hutton, Brooklyn, N. Y.—This invention relates to a new and improved fastening for window sashes, whereby the latter may be supported at any desired height. It consists of a wedge or key fitted in a socket attached to the window frame and interposed between one of the side pieces of the sash and a friction roller in the socket, whereby a very simple and efficient sash fastening is obtained, one which will afford an easy manipulation of the sash, not liable to become deranged by use, and which may be manufactured at a small cost.

Composition for Coating and Lining Oil Barrels and Similar Vessels.—John P. Schenck, Jr., Matteawan, N. Y.—The object of this invention is to furnish a cheap, effective and reliable means for lining oil barrels and for similar uses, so as to prevent leakage or evaporation; and which shall, at the same time, be so elastic as not to be cracked or injured by the spring of the staves in handling the barrels.

Carpet Sweeper.—George Purrington, New York City, and James H. Purrington, Mattapoisett, Mass.—This invention has for its object to so improve the carpet sweepers as to make them more durable, and more reliable in operation.

Rectifier.—A. Werne, New York City.—The object of this invention is to so arrange a rectifier or doubler, through which the vapors are conducted on their passage from the still to the worm, that the low wines may be quickly and completely separated and retained. This device is very simple, small, and compact, and seems to work to great satisfaction; it can be arranged with little expense on old stills as well as new ones.

Target for Air Guns.—Charles A. Demling, New York City.—The object of this invention is to construct a target for practising with air guns, in such a manner that such portions of the same as may be struck by the ball will fall back so as to be out of reach of the shooter; but when all the parts have been thus thrown back, they may at once be brought forward again by only pulling a rope at the foot of the target.

Churn.—R. W. Shriner, Woodland, Mich.—This invention relates to an improvement in the power by which a churn is worked, and has for its object the giving to the dasher an up and down motion, as well as an alternate horizontal rotary motion; and the invention consists not only in the peculiarity of this motion, by which the butter is much easier made than by any other known motion, but also in the construction of the machinery by which the above mentioned object can be attained.

Compound for Sweetening, Coloring and Flavoring Tobacco.—