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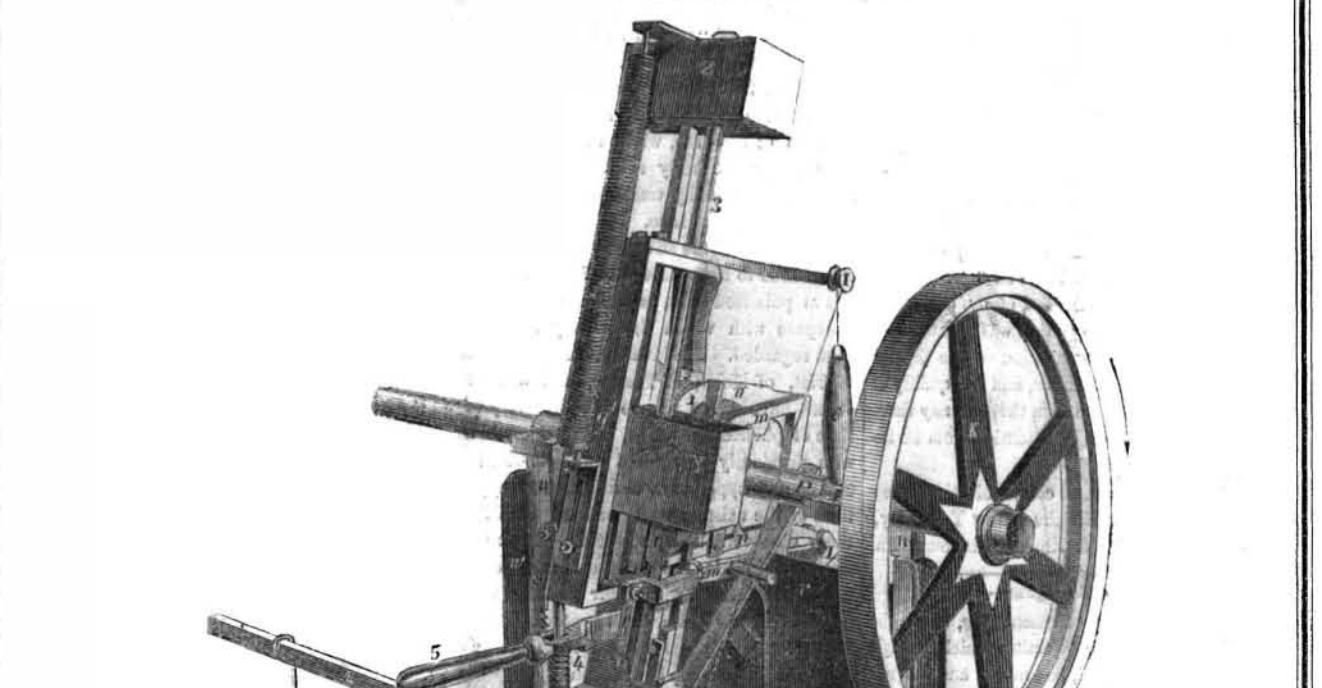
GALLAHUE'S PEGGING MACHINE.



Machine for Pegging Boots and Shoes.

The annexed engraving is a perspective view of a machine for pegging boots and shoes, for which a patent was granted to A. C. Gallahue, of Alleghany, Penn., now residing in this city, on the 16th of last August, and antedated February 18th. The boot or shoe is moved longitudinally and also vibrated, and presents a continual new surface for the pegs to be put in, by some of the most ingenious arrangement of machinery ever presented. This machine also cuts its own pegs. It pegs boots and shoes of any size or shape without guide patterns for that purpose; the shoe or boot in the machine being its own guide. It is easily adjusted to peg any kind of work.

We will first describe the motions of the article to be pegged. *u* is an inverted last of the common kind, on which is an upper and sole to form a shoe, *s*; *s'* is a turn table, and *m' m'* are blocks of wood on it; the last is secured on these by a hook, *o'*, catching into a staple in the lever, *n'*; *q'* is a wedge driven in through an opening in a yoke 4 *s*, on the top of lever, *n'*, and this binds the last with the shoe to be pegged, on it, firmly upon the blocks; *v'* is a rocking table, it vibrates on a rod *v''*, which extends from end to end; *w'* is a sliding trough carriage, which slides in guide grooves in the bed plate, *x'*. This carriage is moved by a cog wheel on the lower end of the vertical shaft, 13, which is driven by a section of a screw on the driving horizontal shaft, P. There are two racks on the other side of the carriage, *w'*, one extending nearly from end to end of it, the other about six inches long at the middle, in the gap of the large one, so that as the carriage is moving along it misses the long rack which feeds it forward, and the cog wheel takes into the short rack, which meshes into a pinion, N, on a short vertical shaft, which is the axis of the turn table; this gives the turn table a half revolution, and brings the heel—or the toe—of the shoe, under the pegging operation, so as to peg round the whole boot and shoe, thus giving a reversing motion to peg the sides and the heel and the toe of the shoe. The spring, *r'*, is a catch to prevent the turn table from swinging round while the sides of the shoe are being pegged, it is operated by a dog below to throw it out when the table is to be turned at one end, and it catches again to hold the table fast, as in *a'*, at the other end. The coiled spring, G, is attached to the underside of the turn table at one end, and at the other side to the carriage. Its tension is to act on the rocking table, *v'*, to make the shoe press against an adjustable guide gauge, set against the edge of the shoe sole, to guide the shoe to receive every peg correctly in the proper line and distance from the edge of the sole. H is another coiled spring attached to the lever, A, at one end, and at the other to a flange on the side of the bed plate; the lever, A, is attached to an upright bar on the other side, which has a catch upon it that descends when the carriage, *w'*, is fed forward, and comes over a cross bar attached to spring, D. This bar, when the carriage, *w'*, has passed over it, is drawn up and catches into a notch in the bottom of the said carriage, so as to hold it in that position until the turn table gets its half revolution; and while the heel or toe of the shoe is being pegged, the carriage, *w'*, is then freed from its catch bar, by a stub on the short rack spoken of, which throws the catch of spring, E, out of its detent, depresses the catch bar which holds the carriage, and allows it to feed forward the shoe, B; C is a coupling lever to throw the cog wheel heretofore described, on the shaft, 13, in and out of gear with the racks of the carriage.

PUNCHING AND PEGGING OPERATIONS.—*w w* are standards to support the top machinery; K is the fly-wheel; P is the driving shaft; J is a cross-brace; *u u* are two gate slides, and *r* is a plate which connects them; M is the peg wood hopper, in which the strip of wood, *h*, to be cut into pegs is placed; it is fed forward by a slide placed behind it, which is actuated by the weight, *e*, at one end of the cord which passes over the small pulley, I. There is a small wedge-shaped knife on the bar above the tube, *a*, through which the pegs are placed in the punched holes: when the said tube is drawn up by the cam on shaft, P, which strikes the projection, *m*, on a stirrup, a peg is cut from the strip of wood, *h*, and forced into the top of tube, *a*; this tube is then pushed sideways by a lever over the next punched hole in the sole of the shoe, and the driver, 18, then comes down and forces the said peg into the shoe, and so on continually. The driver, 18, has an arm and hammer head or weight, Y, on the top of it; this weight is made to slide up and down on the awl rod, 3, the lower part, *h'*, of which rod has a box for the reception of the punching awl. The driver, 18, is lifted by a cam on P, which strikes stirrup *n*, so as to raise the driver out of tube *a*, to allow the cut peg to be forced into it, and then the driver is struck down by another cam which actuates the hammer, Y. On the shaft, P, there is also a cam, for operating the punching awl, the motion of which precedes the pegging; this cam lifts horn 2 of rod, 3; the weight, Z, with the re-action of the springs, *f'*, (one on each side), drives down the awl in *h'*, alongside and before the tube *a*, thus making a hole for the peg. The actions of making the holes, cutting the pegs, and driving them in, are performed alternately, and repeated in procession, one after another, by cams (not seen) on the shaft, P.

There is a roller, *f*, on the foot of a small vertical spindle; this roller rests on the sole of the shoe to be pegged, and is elevated and depressed by the inequalities of the shoe sole; it also holds the shoe firm to the work of punching and pegging. This roller guides and controls the actions of the punching and pegging operations. Its spindle passes through a slot in the lever, 5, above the coiled spring, 4. This lever is retained in its place by notches in the rack bar, 8; *c* is a balance lever, with its fulcrum pin at 4 *f*, and secured at the other end by a joint at y' to the plate r. This lever, with its weight, is a counterpoise to the pressure guide roller, f, to make it sensitive. As the spindle of this roller is secured to the cross plate, which is secured to the sliding gate, u u, and as the bearings of the driving shaft, P, are upon this gate, consequently this shaft is elevated and depressed according to the inequalities or form of the sole of the shoe, over which the roller, f, passes. The whole of the pegging and punching operations, therefore, are adjustable and self-accommodating by these arrangements.

The spring, f' (there is one on each side) for actuating the punching awl, can be graduated to give a light or heavy blow, as may be desired. This machine weighs only about 150 lbs. altogether; it occupies a space of only 2 feet in length and height, and 15 inches in breadth. It can be worked by hand or by a belt driven by steam, horse or water power. It pegs round one shoe in a minute; and completes nearly 30 pairs in an hour. There are five claims in the patent, embracing different points; they can be found in Vol. 8 "Scientific American," in our regular list, of the date mentioned above, when the patent was granted.

This machine is on exhibition at the Crystal Palace; and how it performs, and the quality of work done by it, can be seen there at any time. It attracts a great deal of attention from its ingenuity and novelty.

For more information, communications may be addressed to Mr. Gallahue, New York City, or to Messrs. Kramer & Rhahm, Pittsburg, Pa.

The Imponderable Agents---No. 2.

Against the theory of emanations, as taught by Newton, there is one objection, which, though it has been often urged, has never, and can never be answered. Newton taught that light consisted of particles of the matter of the luminous body; if so, the sun must be decreasing in mass, slowly indeed, yet nevertheless constantly, and this process must in time result in utter extinction. It is vain to say that this process is slight; according to the laws of gravitation there must be an equilibrium between the centripetal forces; and the moment any appreciable quantity of the sun's mass has passed away, the centripetal force would be weakened, and the planets would no longer revolve in the same orbits.

Priestly, casting the concentrated light of the sun upon a delicate balance, attempted to weigh it,—he even fancied he had succeeded, and from the data thus obtained, he proceeded to compute the total diminution of the sun's bulk for a period of six thousand years. But we are satisfied that our intelligent readers will, with us, reject his experiment *in toto*, as the smallest particle of dust floating in the air would weigh more than the pretended weight of the sun's rays, as indicated by his balance. And from the most carefully conducted experiments, as well as from theoretical considerations, it is highly improbable that the rays of light are in the smallest degree ponderable. We regard this argument as an unanswerable one against the Newtonian system,—it cannot be evaded, and is of itself, we think, sufficient to overthrow it. Nor would this waste of matter be as slight as is pretended. When we consider that every point in space within reach of the sun's rays is, at each instant of time, supplied with light from one half the luminous points on the sun's surface; inconceivably minute though the particles of light must be, yet their almost infinite number—a number so great as to mock the powers of mathematical calculation—must, if the Newtonian theory were true, *rapidly* diminish the sun's mass. We are not surprised that from these considerations so many philosophers of eminence have of late been disposed to reject the Newtonian theory and adopt the only other—that of undulations.

Nor is the theory of colors, as explained by Newton, by any means satisfactory. At the time he began his explorations, he entered an untrodden field, and as a first discoverer, he did more to unfold its beauties than ever has been or can be done by any other; yet the light of modern science has rendered improbable many of his deductions. He supposes a beam of white light to be composed of seven different colors, yet he does not attempt to explain in what the difference of these rays consists; he regards the colors of opaque bodies to be consequent upon the reflection of an unequal proportion of the colored rays of white light, but he does not tell us what becomes of the remainder. Brewster attempts to help him out of this difficulty by supposing an absorption of the remaining rays, but this is only giving a name to the difficulty, without explaining it, and besides, what would be the consequence when the opaque body had absorbed to saturation? Sir David has himself shown it unnecessary to suppose the existence of more than three colored rays in the spectrum, but he does not, any more than Newton, point out the difference between them.

The theory of "fits," if we may call a theory which is merely giving a partial expression to a recognized fact, is very incomplete. We consider Newton justifiable in supposing that the particles of light are, when in one portion of their path, more easily reflected, and when in another, more easily transmitted, but he does not tell us why this is so.

The failure of the advocates of the theory of emanations to keep pace with modern discoveries in polarized light, is also one cause of the disrepute with which this theory has of late been regarded. The investigations of Brewster, of Biot, of Malus, of Fresnel, and a host of others, have given rise to the discovery of a class of phenomena which, from their variance with previously recognized laws, rendered necessary new hypotheses, or at least new applications of the existing ones, and the majority of these observers, being advocates of the undulatory hypothesis, their explanations, naturally enough, coincided with their previous views; hence it is now generally supposed that this theory is the only one that will satisfactorily explain the phenomena in question.

As we shall hereafter have occasion to differ from the prevalent opinions concerning the polarity of common light, it may not be amiss now to remark that we cannot discover the evidence on which is founded the assumption of Brewster, that common light is composed of light polarized in two planes situated at right angles to each other. We contend that the fact of the existence of two polarized rays situated in opposite planes, *after* double refraction, is no evidence that they were thus polarized *previous* to double refraction. The same force which refracted may have polarized the rays. Nor do the other modes of polarization afford any proof of the controverted fact, for a similar reason.

Intimately connected with investigations concerning the nature of Light, are the kindred subjects of Electricity, Heat, Affinity, &c., and our next article will be devoted to the consideration of these subjects.

Camphene, Burning Fluids, &c.

The following is an abstract of an article which appeared in the "Journal of Commerce," by Alex. Jones, of this city:—

"We doubt whether there are any other compositions so extensively used in domestic economy, regarding which such gross ignorance prevails, as the articles at the head of this communication. The ignorance has been worse confounded by the introduction of unmeaning names.

It should be remembered that not all inflammable substances are explosive; otherwise fish oil and candles would explode.

We know the whole history of the materials produced by the pine tree, and used for purposes of illumination. And, strange enough, common parlance has applied the word 'camphene' to the whole of them. This name arose as follows:—The idea of using the common spirits of turpentine for illumination, had been long entertained; but its great excess of carbon rendered it unfit for use, as its combustion produced dense volumes of smoke. Attempts were made to neutralize this carbon, by the addition of other substances. It was found that if small portions of gum camphor were dissolved in the spirits of turpentine, it changed it to a clear fluid, which burnt with a bright flame, without smoke, and was no more explosive than common fish oil. This prepared spirits of turpentine was 'camphene,' and was introduced to the public under that name, as a patented article.

It was soon found, however, that the use of camphor rendered it too expensive, and the use of spirits of turpentine was tried in various ways without it.

Finally a lamp was invented, which, by means of a metallic button in the centre of a circular wick at the point of combustion, became so much heated, aided by a good draft through an improved glass chimney, as to consume all the carbon of the spirits of turpentine, producing a steady and brilliant light, far surpassing that afforded by gas, or any other substance, and at about half the cost of winter sperm oil, or gas. The spirits of turpentine thus used, is to this day called camphene, although it has not one particle of camphor in its composition.

By retail, it costs only on an average about 60 cents per gallon, while winter strained sperm oil to produce the same light, costs about 137 cents per gallon by retail. This plain spirits of turpentine (miscalled camphene) is wholly inexplosive, and we defy any party to give a single solitary instance of its ever having exploded.

I have used it in my house for four or five years past, and prefer it to all others.

We have no hesitation in saying that by the use of proper lamps, the streets of cities, and Government light houses, could be illuminated by the use of common pure spirits of turpentine, at about one half the cost of any other material whatever, and with a brilliancy far surpassing all others in proportion to size of burners. Spirits of turpentine is as much a national product as whale oil; and more so than coal gas, distilled, as is usual, from Liverpool coal, and Government should institute experiments as to its applicability for light house purposes. Yet this simple, cheap, and safe light, it is proposed to prohibit from use by Legislative enactment.— This is on a par with the ancient legislation in England, which prohibited the use of bituminous coal.

There is another composition used for illumination, called by the ignorant, indifferently, 'burning fluid,' or 'camphene.' It was found that, if common high proof whisky, or 'alcohol,' was mixed with common spirits of turpentine, it, like camphor, neutralized the excessive carbon, and brought it into a state fit to be burned in an ordinary lamp, like the common oil lamp, with ordinary wick tubes.

This fluid is explosive, or about so much so as alcohol, and requires care in filling lamps.— It, also, is a cheap and beautiful light. Its component parts, alcohol and spirits of turpentine being cheap and cleanly, it forms an exceedingly bright and steady light, better for the eyes than either gas, or oil light. In using the lamps with this mixture, they should always be filled in the day time, and set aside for use. Whenever, through gross carelessness, an explosion happens, it is published to the world as the explosion of a 'camphene lamp.'

We have never heard of an accident of the kind, that was not the result of gross carelessness. They nearly always happen by attempting to fill the lamp while burning, or by bringing the fluid in contact with fire or light of some kind.

The name of 'pine oil' is a humbug. Spirits of turpentine is nothing but oils from pines, (Oleum Terebintha.) The nick name 'pine oil,' only means spirits of turpentine obtained from common rosin, left in it by previous distillation, and then burnt alone, or mixed with alcohol.

The slight effluvia of turpentine, given off by the combustion of spirits of turpentine, I hold to be highly conducive to health, especially in bronchitis, and in affections of the lungs. I experienced a benefit from it in my own case, having suffered severely at times from bronchitis. Indeed, physicians sometimes recommend a residence in the pine forests of the South as a remedy for pulmonary diseases."

REMARKS ON THE ABOVE.—We have said a great deal in the "Scientific American," and many communications from others have also appeared on this subject. We dislike to harp upon one string too often, nevertheless, the subject of artificial illumination is so important to every man, woman, and child in our country, that every person should read all the articles which treat upon it. What a vast amount is expended for illumination in one year. We can form some idea of this when we take in to consideration that every house, store, street, many churches, lecture rooms, factories, &c., in our land, are lighted up for some hours every night. On land and sea, on railroads and steamboats, in cellar and cabin, in castle and cottage, the lamp is trimmed to cheer man in all situations, and in all conditions.

Camphene and alcohol give a more beautiful light than oil; it is cleaner, and we would prefer to use it always, and commend its use in families where there are no children, and where the females are careful and intelligent—not otherwise. We admit that many of the camphene explosions have been caused by carelessness, but just as many by ignorance of the nature of the fluid. Camphene is the proper chemical name of the oil of turpentine. It is composed of C10 H8—carbon and hydrogen. It is the excess of carbon which makes it give off a dense smoke when burned in a common lamp; It did not, so far as we know, obtain this name in the way mentioned above, but because camphor can be obtained from it. The only difference between it and camphor is this.—Camphor is composed of C10, H8, O—one of oxygen. From the camphor tree a volatile oil is obtained, which is isomeric with camphene, and this by oxydation forms camphor and hydrate of camphene. Camphor mixed with turpentine will not prevent it (though we have not tried the experiment) from burning with a dense smoke in a common lamp; we thus judge from the composition of the substances. Neither camphene, turpentine, nor the burning fluid mentioned by Mr. Jones are explosive as fluids. Brandy can be poured upon a lamp without causing an explosion. All substances commonly called explosive fluids must become vaporized before an explosion can take place. The vapor of camphene becomes explosive when it is mixed with O28, (oxygen); this amount saturates it to ignite instantaneously and forms carbonic acid and water. The alcohol and camphene mixture is more volatile than camphene, as it contains more hydrogen (C4, H5O + HO.) All these fluids are perfectly safe to burn, if the vapor can be prevented from escaping. By experiments which were made by the Franklin Institute, the turpentine and alcohol fluid proved cheaper than either sperm, lard, or gas, for illumination. The suggestion by Mr. Jones of our government making experiments with camphene and alcohol fluids is a good one; it is worthy of attention. Newell's Safety Lamp, illustrated in our last volume, is the best we have seen for burning this fluid; it is constructed on the principle of Davy's Safety Lamp, and can be trusted. In our list of claims last week, one was for a can to hold the fluid, which we believe is a good one. The inventor is Dr. Nichols, of Haverhill, Mass. It would certainly be wrong to enact a law to prohibit the use of burning fluids, but at the same time it would not be amiss to make a law to prevent accidents arising from the use of them, so as to punish the culpable and reckless. These fluids can never be used for street illumination, they are neither so convenient nor safe as coal gas sent through tubes; in fact, gas is the grandest and best of all plans for artificial illumination, and we hope the day is not far distant when nothing else will be used in every family in all the cities and villages in our land. Every improvement which tends to cheapen gas light is an incalculable boon to the human family.

Mr. Goddard has arrived at the acme of aronautic achievement, in Paris. He has come down in a parachute on horseback! Two years ago, to *go up* on horseback was a marvel. The parachute was immense, and the cords, extending from its edges to the frame work that sustained the horse, were a hundred feet long.— The umbrella was, by some contrivance, opened before the cord of connection with the balloon was cut, in order to avoid, under the peculiar circumstances of the descent, the rapid fall that ensues till the silk unfurls. The aeronaut above (his brother) let him off at the height of a mile; the descent was easy and gentle.

The steamship "Golden Age," from this city for Liverpool on the 29th ult, returned to port to repair a boiler, through which a hole had been drilled,—strange this.

The raisin crop in Spain has been a poor one; dear wine and dear raisins next year.