spondent advises, without regard to the position of the crank. The valves in this case had probably been shifted after being set by the manufacturer.

We have neither time nor space to enter into any lengthy explanation in regard to this matter, as it can be readily understood by an examination of a diagram similar to that published in our issue of the 24th ult.—EDS.

Water Spouts.

MESSRS. EDITORS:—In No. 22 of your journal I read with interest a very able article entitled "Water Spouts in the Mountains," signed "D C."

I propose to relate the appearance of something similar to what "D. C." describes as a "Water Spout in the Mountains," that I witnessed thirteen years ago. The place of its occurrence was upon Long Mountain, in New Milford, Conn. I do not know its exact elevation, but will call it nearly one thousand feet above the level of the sea.

It was on the 8th of August, 1853, the morning of which broke forth with unwonted splendor, though very hot. Before 10 o'clock, A. M., the wind had veered to every point of the compass, and had been especially partial to the N. W., W. and S. E., making several calls in rapid succession.

We had kept a close watch upon the high clouds which had been forming for the space of an hour, as it seemed, from every place in the horizon. They had a singular aspect and were incessantly rolling, tumbling and whirling, and then vanishing.

These clouds had almost wholly disappeared by noon, and it bade fair for good weather, but while at dinner some one observed "There's a shower in the west," and, looking, I beheld a large black cloud directly in the west looming up at a fearful rate, and in nearly half an hour from the first discovery of the cloud, a medium thunder shower was upon us. The cloud had not quite reached the zenith, barely obscuring the sun, when it commenced to rain. It was apparently a mile wide at its base, and gradually widened to its summit, which covered about 45°—a huge black, inverted trapezoid, every portion of which was trying to gain the peak. It was a grand and sublime sight.

The rest of the sky was clear for a time, when behold, two more black pillars arose simultaneously, the one in the north-west, while the other was directly opposite in the south-east.

These appeared in great haste, and spread in every direction rapidly. The electric fluid was constantly in motion from the first appearance of each cloud, and increased with the clouds, until it was but a constant blaze and roar, ten times more frightful than any battle scene that I ever witnessed, though I have shared the success and failure of many of the hottest contests of the late war.

I was out in the heaviest part of the storm; the sensation produced is difficult to describe; but there was an absence of pure air that made it almost impossible for one to breathe. The hail, rain, thunder and lightning seemed commingled, and descended apparently perpendicularly.

The storm was of about three hours' duration, and, as I ascertained, was principally terrific within a circle of one mile radius. Deep gulches had been washed in the mountain sides, huge boulders had been displaced, weighing many tuns, and in some instances carried to aconsiderable distance, large trees were uprooted, and the Housatonic Railroad Company lost four large culverts in as many miles. The exact amount of hail and rain that fell will probably never be known; but a neighbor of mine had set on empty flour barrel in the open air, near to which there was no other object, and, at the close of the storm it was full, and of course had been running over. It is evident that not less than thirty inches of water and ice fell upon the level during that shower. D. B. D.

Gaylorsville, Conn.

EXTENSION NOTICES.

William Smith, of New York City, having petitioned for the extension of a patent granted to him the 5th day of April, 1853, for an improvement in weaving corded fabrics, for seven years from the expiration of said patent, which takes place on the 5th day of April, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 18th day of March next.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona-fide* acknowledgment of the reception of their funds.

NEW PUBLICATIONS.

POCKET-BOOK OF USEFUL FORMULÆ AND MEMORANDA FOR CIVIL AND MECHANICAL ENGINEERS. By Guilford L. Molesworth. Henry Carey Baird, 406 Walnut street, Philadelphia.

The title of this handy manual is sufficiently suggestive without more than an allusion to its contents, which comprise the data and formulæ which lie at the basis of engineering practice. Not pretending to the character of a treatise, which would be impossible in a volume so small, it gives facts, suggestions, hints, rules, and tables, serving not only as a convenient pocket reference for the thorough mechanic, but as a guide for ordinary workmen. Bound in flexible covers of Turkey morocco. For sale by D. Van Nostrand, 192 Broadway, New York.

THE FOREST-TREE CULTURIST. A Treatise on the Cultivation of American Forest Trees, with Notes of the Most Valuable Foreign Species. By Andrew S. Fuller, of the Horticulturist. Geo. E. & F. W. Woodward, 37 Park Row, New York.

A Timely and appropriate volume which, it is to be hoped, will in some measure, aid in arresting the wholesale and indiscriminate destruction of our forests. The author gives many useful directions in relation to the propagation and care of trees, which are as applicable to fruit as to shade trees. Apart from its value as a manual, it is a very entertaining volume.

MODERN PRACTICE OF AMERICAN MACHINISTS. By Egbert P. Watson, late of the Scientific American. H. C. Baird, 406 Walnut street, Philadelphia.

For apprentices and even for those further advanced, this book will be found invaluable. It teems with useful hints, excellent suggestions, and practical advice drawn mainly from personal experience. It is remarkably free from unexplained technicalities and algebraic formulæ, and is written in a plain, practical, and unassuming manner. The text is profusely illustrated with explanatory engravings, and although much of the matter treats on processes familiar to the experienced mechanic, he will find improved methods described which he could not otherwise learn except by personal communication with others.

IMPROVED PRACTICAL SYSTEM OF EDUCATING THE HORSE. By A. H. Rockwell, Harpersville, Broome county, N. Y.

Some of our readers have doubtless seen the author of this treatise driving his educated horses without reins. The manual contains full instructions as to the methods used in attaining that result, with information on the management of horses in general, and the correction of bad and vicious habits. It is illustrated with explanatory cuts. Price $5, to be obtained only of the author.

REPORT OF THE SMITHSONIAN INSTITUTION for 1865.

We have received the annual report of the above institution for 1865. In addition to the reports of the Secretaries, and a review of the condition of the institution, there are a number of exceedingly interesting papers on popular as well as scientific subjects.

ORIGIN OF THE STARS, and Causes of their Motion and Light. By Jacob Ennis. D. Appleton & Co., Broadway.

We have read this work attentively and with great interest. The points it discusses are of importance to all having any fondness for astronomical studies, while, simply as a work abounding in curious facts, its contents must prove attractive and beneficial to the general reader. The author shows that the earth is a true fixed star, once shining by its own independent light. In the first part of the book he thoroughly investigates the chemical theory of stellar light and heat. In the second part he advances the hypothesis, which he founds on facts, that the conversion or conservation of the atomic force of repulsion, which once held the solar system in a nebulous condition, is the force which prolongs the heat and light of the sun. The origin of the stars is treated of in the third part, while the fourth part shows Gravity to be the force which originally gave motion to the heavenly bodies.

Notes and Queries

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at 50 cents a line, under the head of "Business and Personal Queries."

H. L. W., of Mass.—The foaming of boilers is the sudden rising of the water into the steam space in the form of spray or foam. It is seen exemplified, in a manner, by plunging a piece of hot metal into a vessel containing soapsuds. Its causes are not entirely understood. The presence of oil or grease in a tubular boiler, generally will cause it to foam, while in a flue boiler, with great water surface, its effect is directly the opposite. Soap will often cause boilers to foam and foaming is produced from many causes, some of which as yet seem to be unexplained. When a boiler foams it is known by the sudden rise of the water to the steam gage cock, and, as in priming, water frequently passes into the cylinder. The best remedy we know is careful, regular firing and frequent pumping. . . . We have known the water from a woolen mill where soap, soda, and acids were used, to be employed for steam boilers without injury. Acidulated water will oxidize the boiler, and the alkali and grease in soap may cause it to foam; but one may neutralize the other when mixed in proper proportions. We recommend in all cases the purest water for boilers.

W. M., of Ind.—If your specific for preventing the foaming of boilers will do what you affirm it is a valuable discovery.

W. F. D. of Conn., leads water from a spring over a very uneven surface, through galvanized iron pipe 225 rods long. The head of water, or the difference in hight of the surface of the spring and the delivery end of the pipe, is 35 feet. He is much disappointed in the quantity of water which flows through the pipe, and desires to know if he will get more by setting vertically near the spring an iron pipe 20 feet long and 20 inches in diameter, the upper end being level with the surface of the spring, and his inch conducting pipe being connected with the lower end. We answer: the pipe delivers slowly or the flow of water is retarded by friction of the water on the inner surface of the pipe. The 20-inch pipe at the spring will not help the matter at all. It will not increase the head of water, and it is that only which constitutes the moving force. Perhaps the head might be increased by banking or curbing up the spring.

E., of Conn.—The only reason we can give for your grate bars sinking, is that the bars are too near the crown sheets. You do not give the distance, but undoubtedly it is too small. Your grate to a boiler 48 inches diameter should not be less than 14 inches from the crown sheets. Look to your bridge walls also and see if the throats are not too small. Write particulars and we will answer by mail.

J. E. E., of N. J.—The date of the introduction of circular saws has never been ascertained. They have been used for cutting teeth of watch and clock wheels since the time of Dr. Hook, about the year 1700. Such saws were in use for sawing timber, it is certain, about the year 1790, but the exact date when, or by whom, they were first employed, is not recorded.

F. D., of N. Y., says that there are a number of new burning fluids which are claimed to be non-explosive. He desires us to tell him the composition of these, and to explain why they are non-explosive. F. D. should indicate more particularly the fluids to which he refers. The danger of explosion from burning fluid arises from its volatility, and we know of no way of destroying that property. The construction and use of the lamp has much to do with the question of explosion.

F. G., of Mich.—There are pretty formidable difficulties in the way of heating cars by steam or water. But the advantages of a successful plan would be so great, that the subject is a very promising one for inventors. The present plan of heating surely needs reform. For some thoughts on the subject see page 297.

C. R., of N. Y.—We recommend for your purpose a gold lacquer composed as follows:—Scedlac, 3 oz.; turmeric, 1 oz.; dragon's blood, ¼ oz.; alcohol, 1 pint. Dissolve by digestion and filter for use. . . . . A good way of platinizing the silver plate of the battery, is to connect the plate with a piece of zinc; place the zinc in a porous cup of acidulated water; now set the cup in the platinizing solution, and at the same time immerse the plate in the same.

G. R. asks:—Why do the lightest cutters on a planing cylinder do the most cutting when they are set out the same distance the heavy cutters are, and why do they get dull and worn out the soonest? Perhaps some of our readers will answer this question.

Business and Personal.

[The charge of insertion under this heading is 50 cts. a line.]

P. D. Frey, Chambersburg, Pa., requests information as to the best sizing for putting gold leaf upon glass; also the best manner of burnishing the gold.

Case, Thomas & Co., Waterbury, Vt., request information about coppering iron.

John S. Taxis, Hagerstown, Md., would like to be informed how to unite leather and rubber so as to make a strong and water-proof union.

Joseph H. Bancroft, 121 Hanover street, Boston, Mass., wishes to know where he can procure the safest, cheapest and most economical portable steam heater for a dwelling house of 15 rooms, price, etc.

Dr. J. B. Williams, Pittsburgh, Pa., wishes to know who has the patent for the U. S. of Rousonie's patent silicious concrete stone.

J. T. M. Barnes, Baltimore, Md., desires to procure machine for making paper bags. Give full particulars as to sizes, cost, etc.

W. R Tuttle, Knoxville, Tenn., wants a machine for breaking up stone for macadamizing roads; also the best brick machine.

W. McGuire, Edgefield Junction, Tenn., wants the best machine for making staves 60x4or5x 1-inch thick Also a cross-cut wood sawing machine, also circular saw, also bucket and tub machine. We can furnish Vols. 14 and 15 only bound, $3 75 per vol.

F. M. Patterson, Seymour, Ind., wants a small turning lathe, for wood.

J. W. Sever, Fredericksburg, Va., desires to obtain a good and reliable water meter.

P. Fagererans, Princeton, Ill., would like to communicate with makers of belfry and tower clocks.

J. R. Carpenter, Salem, N. J., desires the address of Wm. H. Pinner, patentee of rendering pans.

S. Hewes, Boston, Mass., desires to know which of the various electro-magnetic machines for medical use yields the strongest electric current.

J. B. Whitehouse, Florence, Mass., wishes to know where he can purchase an instrument to ascertain the power of any machine, cost, etc.