patent granted to him the 18th day of October, 1853, for an improvement in the application of high-pressure engines to screw propellers, for seven years from the expiration of said patent, which takes place on the 18th day of October, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 30th day of September next.

Samuel Pratt, of Hammonton, N. J., having petitioned for the extension of a patent granted to him the 25th day of October, 1853, for an improvement in screw nails, for seven years from the expiration of said patent, which takes place on the 25th day of October, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 7th day of October next.

David M. Smith, of Springfield, Vt., having petitioned for the extension of a patent granted to him the 25th day of October, 1853, for an improvement in spring clamp for clothes lines, for seven years from the expiration of said patent, which takes place on the 25th day of October, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 7th day of October next.

Recent American and Foreign Patents.

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

RAILROAD SPIKE.—Lewis Postawka, Boston, Mass.—This invention consists in constructing a spike, designed more especially for securing rails and their chains to the ties or sleepers, with a longitudinal slit extending from its point upward a certain distance, and having the ends of the slit or slitted portion beveled at their inner sides, so that, when the spike is driven into the tie or sleeper, the resistance which the latter offers to the penetration of the former, will cause the two parts of the spike, formed by the slit, to spread out or diverge, so as to effectually clinch the spike.

RUDDER.—Thomas W. Murray, New York City.—This invention consists in constructing the rudder with a cast-iron post, and securing the blade of the rudder, which is of wood, to the post in a novel way, and also in a novel way of securing the rudder post to the stem post of the vessel. The object of the invention is two-fold; to wit: to prevent the unshipping of the rudder, and to obviate the contingency of the bending and twisting-off of the rudder post.

CLEANING HARNESS AND OTHER LEATHER.—George H. McCleary, Hollidaysburg, Pa.—This invention has for its object to furnish an improved process by the use of which old harness and other dry and hard leather may be renovated, or made soft, pliable and tough.

RAILROAD CAR WHEEL.—David Forrest, Eastport, Me.—This invention has for its object to furnish an improved car wheel, so constructed that the parts most subject to wear or liable to be broken may be replaced when worn or broken, and which shall be very compact.

CHURN.—Wm. Weddington, Winterset, Iowa.—This invention has for its object to furnish an improved churn, so constructed and arranged that the churning may be done by air introduced into the churn.

GATE.—E R. Wolfe, Plymouth, Pa.—This invention has for its object to furnish an improved attachment for closing gates, which shall be simple, cheap, efficient, easily constructed, symmetrical in appearance, and which shall have no projecting parts to catch upon passing objects.

MACHINE FOR WASHING AND DRYING DISHES.—A. W. Ward, Fishkill, N. Y.—This invention has for its object to furnish an improved machine by means of which dishes may be washed and dried quickly, thoroughly, and conveniently.

POTATO DIGGER.—Henry P. Smith, Denton, Mich.—This invention has for its object to furnish an improved machine by means of which the potatoes may be easily and rapidly dug and separated from the dirt that may adhere to them.

WASHING MACHINE.—Butler R. Platt and Joseph A. Gray, Holland, Mich.—This invention has for its object to furnish an improved machine by means of which the clothes may be washed quickly and thoroughly, and which may be easily adjusted to wash coarse or fine clothes.

HORSE RAKE.—John B. Hoag, Oxford, Ill.—This invention relates to a new and useful device for holding a horse rake when working and releasing it when loaded, to enable it to revolve and dump the hay.

COMBINED WRITING DESK AND TABLE.—Albert A. McMore, Brooklyn, N. Y.—This invention relates to a new and improved arrangement whereby two indispensable pieces of furniture are combined in one, and the invention consists in attaching the top of a table to the frame in such a manner that the table is transformed into a writing desk in one second of time, and altered to a table with equal facility.

OFFICE CHAIR.—Robert Fitts, Fitchburg, Mass.—This invention relates to improvements in the construction of arm chairs designed for use in offices and for other purposes.

EXTENSION BEDSTEAD.—Jacob Holzmann, New York City.—This invention relates to a new bedstead which can be extended in length and width, so that it can be used for children or as a double bedstead for adults, as may be desired. The invention consists in making each of the side bars as well as the end bars or heads of two pieces, so that the ends as well as the sides can be made longer or shorter at will.

CARTRIDGE BOX.—William H. Morris. Cold Spring, N. Y.—This invention consists in constructing a cartridge box with a series of blocks or cartridge receivers constructed and arranged in such a manner that a greater number of cartridges than usual may be contained in a case of a given size, and the cartridges extracted from the blocks or receivers with the greatest facility.

CULTIVATOR.—William E. Smith, Oquawka, Ill.—This invention relates to a new and improved cultivator of that class which have their plows or shares attached or arranged in such a manner as to be capable of being moved or adjusted both vertically and latterally by a person walking at the rear of the machine.

TETHERING ANIMALS.—Warren Johnson, Fisherville, N. H.—This invention relates to a new and improved device for tethering animals and is an improvement on that class of tethers which are composed of a weighted pole connected by a swivel to an upright or stake. The invention consists in an improved swivel by which the pole is connected to the upright or stake.

WASHING MACHINE.—W. W. Adams, West Derby, Vt.—This invention has for its object to furnish an improved washing machine so constructed and arranged that the washing may be done quickly and easily, which will not tear the clothes, and with which the labor of handling the clothes shall be greatly diminished.

MAKING BUNGS, PLUGS, TAPS, ETC.—Wm. L. Standish, Pittsburg, Pa.—This invention consists in constructing and combining mechanical devices for making bungs, plugs, taps, etc., for barrels and other purposes.

SASH FASTENER.—George King, John Gomber and Lindhurst Shope, Frederick, Md.—This invention relates to a new and improved device for fastening window sashes.

STEAM CUT-OFF.—L. Griswold, Portland, Wis., and G. Caul, York, Wis.—This invention consists in providing a steam chest with cylinders and pistons or valves and apertures and arranging them in such a manner that the valves or pistons which admit and cut off the steam shall not be subject to undue friction in consequence of the pressure of the steam and also so that the steam is made to operate upon the main shaft when the crank is on the center.

BROAD-CAST SEEDERS.—Jacob Slauder, Osborn, Ohio.—In this invention the seed board is made reversible, so as to throw the seed in front of or behind the plows at pleasure. Secondly—the plows can be removed and drill teeth substituted, hose being attached for the purpose of conveying the seed from the seed-board to the conducting tubes. Thirdly—the seed box can readily be adjusted to sow oats as well as wheat and other grains.

DEAD BODIES.—Colin Cree St. Clair, Washington, D. C.—In this invention a liquid composition or cement is poured around the body in a suitable mold, which, drying and hardening, effectually preserves the body and at the same time serves the purpose of a coffin or sarcophagus.

CHURN.—L. M. Cook, Owatonna, Minn.—In this invention the churn is provided with two stationary and two movable dashboards.

HEDGE PRUNER.—Frederick Bender, Baltimore, Md.—In this invention the cutting blade is made with a perfectly straight edge, and when closed enters a longitudinal slot in the opposite blade, which is also straight.

CORN PLANTER AND FERTILIZER.—John B. Gemmill, Strawbridge, Pa.—The object of this invention is to combine in one machine a corn dropping mechanism and mechanism for depositing a phosphate or other fertilizing material, together with a novel and simple arrangement of devices for operating the slides which regulate the flow of the material from the hoppers.

MACHINE FOR DIGGING AND GATHERING POTATOES.—Christian G. Grabo, Detroit, Mich.—This invention has for its object to furnish an improved machine by means of which potatoes may be dug and gathered thoroughly and cleanly.

SNOW PLOW.—R. S. Harris, Dubuque, Iowa.—This invention has for its object to furnish an improved apparatus by means of which the snow may be readily removed from the track and thrown to a sufficient distance at one or both sides of said track, to be wholly out of the way.

WINDOW-BLIND FASTENER.—Jackson R. Baker, Jersey City, N. J.—This invention has for its object to furnish an improved fastening, by the use of which the blind will be held securely when open, and which can be operated to close the blind without its being necessary to reach so far out of the window as is the case when the ordinary fastening is used.

LOCK.—Robert M. Webb, New York City.—This lock is of that class of locks employed for articles having hinged or rising and falling lids, covers, or tops, such, for instance, as pianofortes, sewing-machine cases, etc.

LATH FRAME.—Albert Reed, Mankato, Minn.—This invention relates to a frame so constructed as to facilitate the nailing and securing of laths to the side of a room and at regular and equal distances apart, so as to leave spaces or openings of a uniform size or width between the several rows or series of laths.

CULTIVATOR.—Jacob Wilson, Somerford, Iowa.—This invention relates to a new and improved two-horse cultivator for cultivating those crops which are grown in hills or drills, such as corn, cotton, etc. The invention consists in a novel and improved construction of the parts, whereby the rider or operator has full control over the plows, being enabled to raise and lower and move the same laterally with the greatest facility, and the draft mechanism also improved and rendered more favorable for the horses than hitherto.

COMPOSITION PLATE FOR ARTIFICIAL TEETH.—G. F. J. Colburn, Newark, N. J.—This invention relates to a new and improved composition for the plates in which artificial teeth, or teeth and gums, are set. The object of the invention is to obtain a composition for the purpose specified, which will admit of being manufactured or molded into the desired form, and the teeth, or teeth and gums set into it with far greater facility than hitherto, and which will also possess the advantage of admitting of repairs being made (broken teeth replaced), with far less difficulty than with either the metallic (gold) plate or with the hard rubber or vulcanite plate.

BASE FOR ARTIFICIAL TEETH.—G. F. J. Colburn, Newark, N. J.—This invention consists in combining a peculiar composition with a metal plate, whereby a very superior base for artificial teeth is obtained, one which will be strong and durable, possess the advantage of being readily and economically repaired when necessary, as, for instance, the replacing of a broken tooth, and which may be worn by any person with the greatest convenience and comfort, even those to whom the hard rubber or vulcanite bases are repulsive.

SAW MILL.—Alfred Gifford and Robert L. Felts, Milroy, Ind.—This invention relates to a new and improved reciprocating saw mill, and has for its object portability, to admit of the whole machine being drawn from place to place by yokes of cattle, and also admit of being driven or run by a small engine and to operate rapidly.

PAPER NECKTIE.—Hiram Whitney, Watertown, Mass.—This invention relates to the manufacture of neckties from paper, and consists, first, in providing a necktie made from paper, with an extension piece along its upper edge, and a folded piece upon its lower edge, having a buttonhole in the same, by means of which two pieces the necktie can be secured upon the front button of the shirt.

STOVE-PIPE SHELF RACK.—John Turner, Marshalltown, Iowa.—This invention relates to a new device for utilizing the strength as well as the heat of stove-pipes, and consists in arranging shoulders firmly around the stove-pipes, and placing thereon revolving shelves upon which plates and other kitchen utensils can be placed.

BUTTON.—Victor Charlet, Hoboken, N. J.—This invention relates to a revolving button fastening which is so arranged that the said fastening projects from one side of the shank of the button when being applied, and can be made to project from opposite side of the same after being applied.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

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."

☞ *All reference to back numbers should be by volume and page.*

A. H. G., of Mo., and also J. K. of the same state ask: "Why do the notches of the quadrant on a locomotive vary in distance when the steam is admitted and cut off in a regular ratio?" The graduation of the quadrant on the locomotive is not done by an unvarying rule. It is determined by turning the engine and noting the movement of the valves. The motion of the link is compound, owing to the setting of the eccentrics, which are not set exactly opposite each other. It is also varied by the length of the eccentric ends. Scarcely any two engines have their quadrants slotted precisely the same. Without elaborate diagrams it is impossible, on account of the above facts to demonstrate the subject.

W. J. B., of Mich., wants to know what proportion of a horse power five square inches of water, operating on a wheel 6 5-9 inches diameter, under a head of four feet, provided the water transmits its whole power, will develop. The actual weight of a column of water, not in motion, of the dimensions of five square inches sectional area and four feet high, is 42.60 lbs. The velocity of the water and the description of wheel are essential data to a categorical reply.

A. H., of N. Y., asks us to publish engravings and descriptions of the condensing steam engine. It can be found in the "Guide to Inventors," published by Munn & Co. Price 25 cents.

R. S. S., of Ga., says he has three elbows in a pipe conveying wind from a fan to a cupola, and that the fan gives much less blast than when it was run with a straight pipe. The trouble is probably in the elbows. The remedy is to make the elbows larger than the straight pipe. Where elbows are used they should have four times the sectional area of the straight pipe. Usually the pipes of fan blowers are too small.

C. F. S., of Mass.—Iron and zinc castings may be bronzed by precipitating on the surface by the battery or otherwise, a coating of copper.

D. B., of N. Y.—We have had practical experience in the manufacture of grape sugar from starch, using sulphuric acid and lime, and have fermented the sirup without encountering the difficulty you allude to. We suspect that you have mismanaged the process in some way.

J. B., of N. Y., thinks that the gases from a gun which is fired, cleave the air and leave behind them a vacuum; the concussion on filling up the vacuum produces the sound. The theory is bad: the vacuum is mostly imaginary. The gases of burning gunpowder tend to expand equally in all directions, and to produce condensation rather than rarefaction. After the bullet has left the gun there is a vacuum in its path.

M. S. D., of N. Y.—Some of the most useful cements for water joints, are white lead and oil, india-rubber, rosin and lard, shellac, sealing wax and pitch. The choice among them would be determined by the materials used in the construction of the apparatus, its size, etc.

E. H. R., of Mass.—If you still find metal unsuitable for the molds in which you cast your Babbitt or other alloy we suggest that you try soapstone. Soapstone is easily brought into form and will give a good surface to the casting.

J. B., of Ill.—The utility of sand to the blacksmith in welding iron, arises from the fact that it makes a flux with the superficial oxide which protects the iron from burning and keeps its surface clean.

J. S. McC. of Ohio.—We do not think that plaster of Paris would answer for "small and delicate cores for cast iron."

A. T. S., of Conn.—The weight of the earth has been determined with great accuracy. The elements for the calculation are the mean density (5.6604 greater than water) and the cubical contents.

G. H., of N. J.—Pine wood yields less acetic acid on distillation than almost any other kind of wood, and it is doubtful if you can separate the acid with profit in the circumstances you mention. There is nothing cheaper than lime to neutralize the acid.

J. N., of O.—We are not aware that the philosophy concerned in the renovation of feathers by steam is fully understood. There can be no doubt that feathers are often injured by parasites, and that steam will destroy them as you suggest.

R. G., of Ill.—Borax is found in California and we are told in quantity sufficient to supply the whole American market.

J. E. H., of W. Va., asks what is the power of an engine 10-inch cylinder, 20-inch stroke, making 100 strokes per minute, and carrying 90 lbs. of steam? The effective power of your engine, if you *have* 90 lbs. on the piston, working full stroke, is 33.57 horse-power. You do not say whether the steam is throttled by your governor or not. If it is, the power would be less, and can only be determined by the indicator.

N. D. J., of Mass.—We know of no way to harden a casting of soft iron unless by ordinary case hardening. Possibly some of our readers may know of some effectual method, beside chilling in the mold, to render your castings hard. We think such knowledge might be useful to some.

J. G., of Texas.—"A friend of mine who has raised a large family, and they have all married off except one daughter, and no one knows how soon she may have an opportunity to try matrimonial felicity, and as he does not wish to break up house keeping, and his wife's hands are so drawn up with the rheumatism that she neglects the dairy work and her servants have all left her, and in order to live on the dainties of the dairy it is necessary that the cows be milked, HENCE" (Good Heavens! What does he want? The above reminds us of the preamble to the Declaration of Independence. "J. G." is no doubt a rigid parliamentarian, perhaps a member of Congress, and—) "he wants a milking machine." Inventors of milking machines to the rescue!

H. A., of Conn.—The light emitted by a solution of phosphorus in oil or ether is very feeble, and would not be sufficient for a miner's lamp. The light resembles the phosphorescent light of decaying wood or fish.

R. S. N., of O.—Vegetable fiber from whatever source it is obtained, when purified from foreign matter is always the same substance chemically. Paper may be made from any vegetable fiber, but one plant will be preferred to another for the purity, strength, abundance of the fiber, etc. In a few years more paper will be made from wood than from rags. Even now it is almost entirely used on daily papers.

J. C. W., of Pa., says he is using in his foundery Scotch pig, Lake Superior, and scrap iron, and finds much difficulty in getting sound castings. Notwithstanding careful skimming, a large amount of "stodge" finds its way into the flasks and injures the castings. He asks for a remedy .... He asks also what is the proper place to put the gage cocks in a horizontal cylinder boiler of 32 inches diameter. Answer 1; the Lake Superior and scrap iron will turn to "stodge" much more rapidly than the Scotch pig; probably you use too large a proportion of those qualities. You can keep much of this scoriæ from your castings by making high and wide pouring gates, thus allowing these lighter particles to rise from your castings. Unless you do this you will find an open, porous, and rough upper surface on your castings. A small quantity of sawdust or fine charcoal thrown on the surface of your iron in the ladle will take up much of the floating scoriæ. .... Answer 2; place your lower gage cock 2½ inches above the line of fire surface, the next 2½ inches above that.

H. M. B., of Ill.—The aniline colors are readily soluble in spirit varnish, and you will find varnishes so colored useful in making the transparent paintings for your magic lantern.

Business and Personal.

The charge for insertion under this head is 50 cents a line.

NEW PUBLICATIONS.

ATLANTIC MONTHLY for August. Boston: Ticknor & Fields.

One of the best numbers of this most excellent monthly. The *Atlantic* is especially fortunate in its contributors, or rather in its managing editors; for it contrives to get the cream of current American literature. Among the other excellent articles in this number we call attention to "Hospital Memories," "Cincinnati," "Up the Edisto," and a "Lilliput Province." Indeed, every contribution and the criticisms of the Editors' department are especially superior and interesting.

SECOND ANNUAL CATALOGUE OF THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

It exhibits a very promising future for this new institution, and we are pleased to see that mechanical and civil engineering, practical chemistry, and mining occupy prominent positions in the course of studies. For particulars address William P. Atkinson, Secretary and Librarian, Massachusetts Institute of Technology, Boylston street, Boston, Mass.

RESULTS OF METEOROLOGICAL OBSERVATIONS made at Brunswick, Me., between 1807 and 1859, by Parker Cleaveland, LL.D., Professor in Bowdoin College.

This collection of calculations, interesting and valuable to the astronomer and the geometrician, is published by the Smithsonian Institution in a large quarto pamphlet which can be obtained by addressing B. Westermann & Co New York.

SKELETON STRUCTURES, Applied to Bridges, by Olaus Henrici, Ph.D. New York: D. Van Nostrand, 192 Broadway.

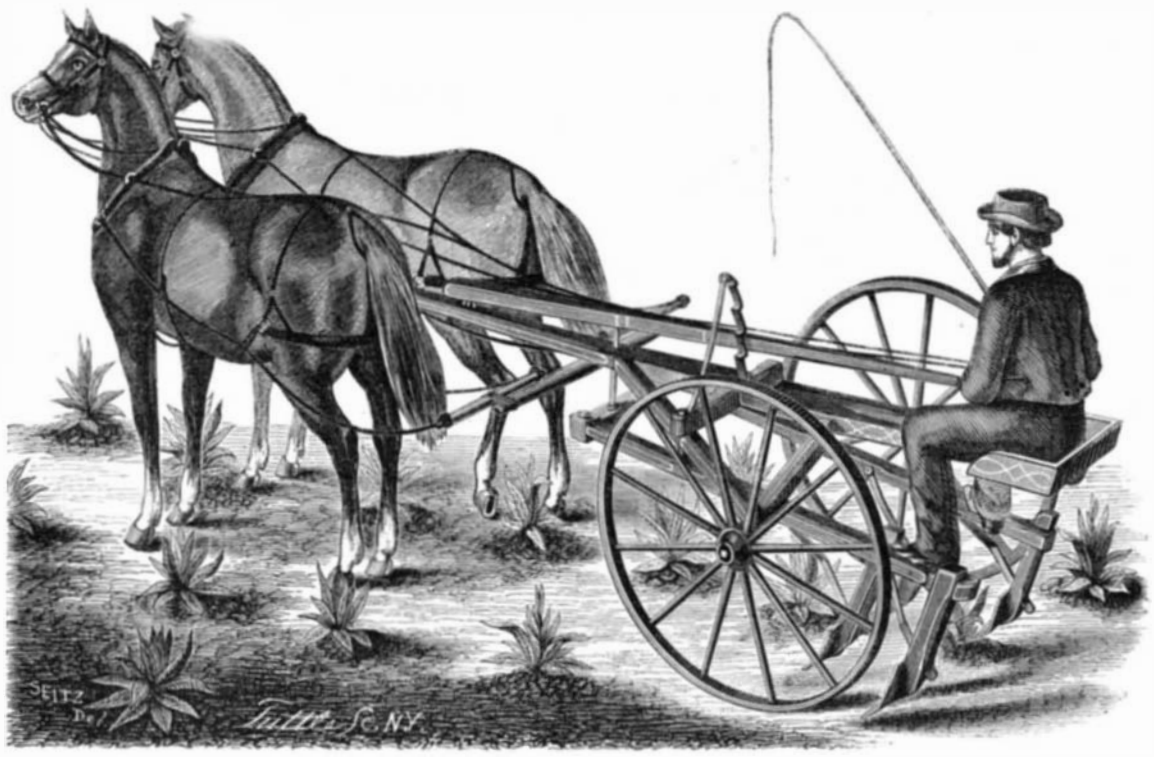
Especially valuable to the practical engineer and useful to the student in civil engineering. The plates accompanying the work will be found very useful both to the student and the working engineer. The calculations and directions are plain, and will save much time and brain labor now uselessly wasted.

ASTRONOMICAL OBSERVATIONS Made at the United States Naval Observatory during the years 1851-2. Published by authority of the Secretary of the Navy.

For astronomers, navigators, and scientific students these tables will probably be of great use in the saving of time in making calculations, and in assisting the solution of problems usually entailing a vast amount of labor They are very systematically arranged and of easy reference.

Improvements in Cultivators.

This device for cultivating plants grown in rows or hills differs from some others in its construction. It belongs to the class the shares of which work on both sides of the row at the same time. For this purpose the axle is inclined from each wheel upward to the center, this arrangement giving a considerable hight from the ground to the longitudinal center of the vehicle. The two bars to which are secured the shares, are pivoted to diagonal braces extending from the axletree to the pole, and connected at their front ends by a bar pivoted at each end to those which carry the shares. By this arrangement the driver can move by his feet—which rest upon the bars—the shares either to the right or left to accommodate the cultivator to the sinuosities of the rows. The share bars can be readily elevated to pass over obstructions by means of the lever over the pole, which is pivoted to the pole at its front end and held in position by the toothed rack. These movements are entirely under the control of the driver. No cultivator which has yet come under our notice is so simple in construction and consists of so few parts. It would seem almost impossible for it to get out of order, and its parts are so easily made and combined that they could be built and put together by any ordinary mechanic. The number of shares can be added to or diminished as may be desirable.



ARNOLD'S EUREKA CULTIVATOR.

A patent was obtained for this device through the Scientific American Patent Agency Feb. 26, 1867, by Omar J. Arnold of Mount Ida, Wis., who will sell rights in all the States except Illinois, Indiana, and Michigan, and for information concerning rights or machines in those States, address Mark Finnican, Dowagiac, Mich.

French Photographs.

It seems to be generally admitted at the exhibition, that the pictures of Adam Solomon, an artist of Paris are pre-eminent in excellence. Photographic artists, who plumed themselves upon their merits, look upon the productions of Solomon with astonishment. Says the *Photographic News*:—

"The first excellence is the admirable arrangement of light and shade throughout the picture, as produced by the lighting and the skillfull disposition of draperies, accessories, and background, on none of which is in any case, the touch of a pencil to be found. The perfection of the chiaroscura, the rich depth and transparency of the shadows, the perfect modeling and effect of solidity and relief, not in the head simply, but in every part of the picture, are not qualities to be obtained by retouching; and we should be sorry if anyone who sees these pictures should deceive himself, and rob himself of the legitimate lesson to be acquired, by any fancy that the excellence was due to retouching, or trick of any kind, or to anything but legitimate photography of a degree of excellence very rarely attained. We do not lay any especial stress upon the fact that we have seen the negatives and the prints in the course of washing, but we earnestly urge photographers who have the opportunity, to honestly take to heart the lesson to be obtained by a careful examination of the pictures exhibited."

Aerial Navigation.

From the time of the fabled Icarus men have tried to solve by experiment the problem of navigating the air. So far the success has been confined to rising above the earth's surface by means of a gas of greater levity than the atmosphere, all mechanical means to rise above the earth and sustain the body in the air having failed. But in England they have an Æronautical Society of which the Duke of Argyle is President and Sir Chas. Bright, William Fairbairn, James Glaisher, and other prominent men are members. A paper has been read by Mr. Wenham, which is said to be "full of close reasoning, and differing entirely from the illogical speculations often put forth by enthusiastic projectors, who set to work according to methods that inevitably lead to failure." He examines at large the flight of birds, the extent of surface of wings of different kinds, the weight of bodies, the muscular strength required for flight, the much less power needed for horizontal or angular motion in the air than for perpendicular ascent, and other questions bearing on the subject. He considers that the attempt to simply imitate the flight of birds is impracticable, but concludes that "man is endowed with sufficient muscular power to enable him to take individual and extended flights, and that success is probably only involved in a question of suitable mechanical adaptations."

Boiler Burst While Being Tested.

On the 20th of July a new boiler while being tested with steam at the manufactory in Water street this city, collapsed its fire-box. An after examination by a competent engineer reveals the following facts:—There was no evidence of low water in any part of the boiler; the stay bolts were all bright; the surface of the ruptures clean, as were also the joints where chipped and caulked, showing there could have been no overheating. The cause of the rupture was simply a pressure of steam beyond the ability of the plates to sustain.

The boiler was 34 inches diameter, the fire-box circular and in diameter one and a half inches less. The stays were at the angle of a parallelogram of seven by nine inches, stay bolts three-quarters of an inch diameter, screwed and headed in the usual way, the heads slight. The boiler plates were three-sixteenths thick, apparently good iron. About one-half of the fire box collapsed pulling the heads of the bolts through the plates.

The boiler was an upright tubular boiler having hanging water tubes passing through the crown sheet and hanging in the fire box, and above the crown sheet to the top of the boiler were tubes to convey away the products of combustion. As will be seen from figures already given, the water space between the fire box and the shell was only three-quarters of an inch, altogether too little.

BELLERJEAU'S IMPROVED LAMP CHIMNEY.

Metal-topped lamp chimneys are in quite common use, but the metallic top is generally connected to the glass, and except for its preservation of the glass from heat-cracking, does not appear to be a very marked advantage. In this improvement the metal top is secured to the stand for the glass chimney by means of two metal strips or uprights, and the glass slips down over the metal top, and while resting its base upon the circular support, is steadied in place by the sheet-metal

top. It has its advantages in giving excellent support to the glass while the lamp is being moved about and in the ease with which it can be lifted, as shown in the engraving. The edges of the flame, always the hottest portion, are directed against the metallic uprights, which thus defend the glass from intense heat, and the upper portion of the glass is adapted in its inside diameter to the outer diameter of the metal top, so that the draft of the chimney is not impaired.

While kerosene oil is so generally used it would seem as though this improvement, which can be applied to any lamps now in use, would become a favorite. Samples can be obtained, or the patent right may be purchased, by addressing the patentee, John Bellerjeau, or Bellerjeau & Gabel, 261 North Third street, Philadelphia, Pa. The patent for this device was granted June 4, 1867.

The Society of Arts' Albert Medal.

The Albert medal has this year been awarded to Mr. W. Fothergill Cooke, and Prof. Charles Wheatstone, F.R.S., in recognition of their joint labors in establishing the first electric telegraph. The first Albert medal was awarded, in 1864, to Sir Rowland Hill, K.C.B., "for his great services to arts, manufactures, and commerce, in the creation of the penny postage, and for his other reforms in the postal system of this country, the benefits of which have, however, not been confined to this country, but have extended over the civilized world." The second medal was awarded, in 1865, to his Imperial Majesty the Emperor of the French, "for distinguished merit in promoting, in many ways by his personal exertions, the international progress of arts, manufactures, and commerce, the proofs of which are afforded by his judicious patronage of art, his enlightened commercial policy, and especially by the abolition of passports in favor of British subjects." The third medal was awarded, in 1866, to Professor Faraday, D. L. C., F.R.S., for "discoveries in electricity, magnetism, and chemistry, which, in their relation to the industries of the world, have so largely promoted arts, manufacture, and commerce." In making the award this year, the council were placed in a somewhat peculiar position, inasmuch as by the terms upon which the medal was established they could only make one award, while the great object accomplished was due to the combined labors of two men. They felt, however, that so great a national work as the electric telegraph was especially worthy of reward by this society, and that the Albert medal could not be more worthily bestowed than in recognition of the services of those to whom the introduction of the telegraph was due. The award having been made, they have directed that the medal be struck in duplicate, and a copy, with a suitable inscription, be presented to each of the above-named gentlemen.—*Engineering.*

New Use for the Barometer.

Mr. J. Rofe writes to the *Geological Magazine*, and shows that colliery proprietors have only to watch the barometer, and provide in accordance with its indications, for the supply of air to the mines. Alluding to the well-known "Blowing Well," of Preston, in Lancashire, he states that some time since, in a well, recently constructed by him as a cesspool to some chemical works, he observed the phenomena characterizing the "Blowing Well." When the atmospheric pressure diminished, the air came from the well loaded to a disagreeable extent with the offensive vapor from the cesspool. On continuing his observations with a barometer, he found similar results. He concludes from these facts that a coal mine must be regarded as a gigantic well, from which, when the atmospheric pressure diminishes, the air expands and rushes out with great violence. This circumstance is not of itself dangerous, but if there be an excess of gas in the mine, and at the same time, from accident or carelessness, a means of ignition, then, indeed, the consequences are very likely to be serious. Hence the barometer becomes the miner's safest guide.

Petroleum as Fuel for Locomotives.

The Titusville *Herald* describes the fourth of a series of experiments made at the shops of the Warren and Franklin Railroad at Irvine, as follows:—"The apparatus used was Spencer's burner. It is described as consisting of a pan covering the bottom of the firebox in the locomotive, and taking the place of grates. On the pan are placed heaters or gas-generators, six in number, consisting of inclined plates of cast iron supported at an angle of forty-five degrees. Opposite to each heater is an injector, conveying the oil to the heater, where it is instantly converted into gases, oxygen being only furnished to the gases in their nascent state for combustion. The oil is contained in a tank on the tender, from which it is conveyed by feed pipes to the injectors, each pair of injectors being controled by a throttle by means of which the fire is regulated as readily as the light of a lamp. The locomotive used, weighed thirty-one tuns, and was of one hundred and fifty horse-power. No cars were attached. Under eighty-five pounds of steam the locomotive passed over four miles of track in less than eleven minutes. All in the party agree that oil may supersede wood and coal in railroad use."

There is at present no better field for invention than the contriving of furnaces for producing combustion safely and economically from petroleum. Also, in the feeding from and construction of tanks for conveying the liquid..

A WESTERN CAPITALIST proposes to send wheat in a fleet of steam grain barges down the Mississippi River to New Orleans, and thence re-ship it to this city for the sum of thirty cents a bushel, just one-half the ruling rates when transported overland, "The longest way round is in this case, apparently, "the shortest way home."