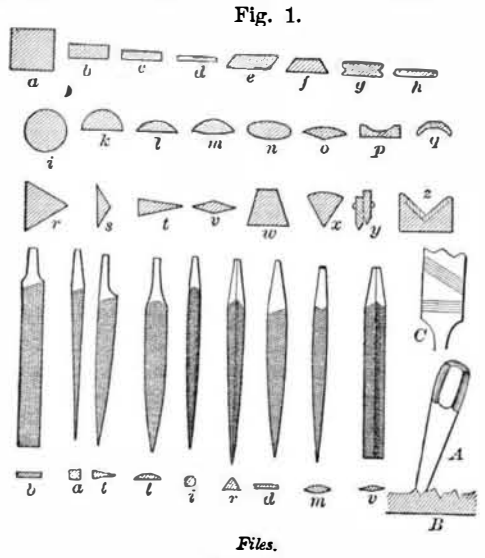
FILES, FUSES, AND LOW WATER ALARMS.

Our extracts from Knight's "Mechanical Dictionary,"* this week, include illustrations of all the different forms of files, of a variety of fuses, electric and otherwise, and of a number of ingenious low water alarms.

Files are graded by shape, size, and fineness of cut; and also are known by their purpose. As to shape, the series of sections given in Fig. 1 will be readily understood. *a*, *b*, *c*,

Fig. 1.



Files.

d, *e*, *f*, *g*, *h* are sections derived from the square; *i*, *k*, *l*, *m*, *n*, *o*, *p*, *q* are derived from the circle, and *r*, *s*, *t*, *v*, *w*, *x*, *y*, *z* from the triangle. The files represented in the succeeding engravings are known as follows: *a* is a square file, parallel or taper, sometimes with a safe side; *b*, when large, is a cotter file, when small, a verge or pivot file. *c* is a flat file; when small, a pottance file; when narrow, a pillar file. *d*, when parallel, is an equaling, clock pinion, or endless screw file; when taper, a slitting, entering, warding, or barrel hole file. *e f* is a French pivot or shouldering file; when parallel, a V file. *g* is a nail file for the finger nails; *h*, a pointing mill saw and round edge file; *i*, round, gulleting, or rat edge file; *k*, frame saw file; *l*, half round, nicking, piercing, or round-off file; *m*, cross file, double half-round file; *n*, oval file; *o*, balance wheel or swing wheel file, the convex side only being cut. *p* is a swaged file for finishing brass moldings; *q*, a curvilinear file; *r*, triangular, three square, or saw file: *s*, cant file, for filing inside angles of 120°; *t*, when parallel, is a banking or watch pinion file, when taper, a knife edge file. *v* is a screw head, feather edge, or slitting file; *w*, a valve file; *x*, triangular-and-half-round file; *y*, double or checkering file for gunsmiths; *z*, double or pencil-sharpening file.

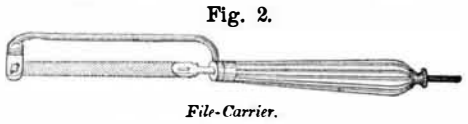
As to character of teeth, the classes are: Double cut, having two sets of teeth crossing obliquely; single cut or float, having but one row of teeth; rasp, having detached teeth made by a punch instead of a chisel. At A is shown the position and action of the file chisel on the blank. C shows the appearance of the rows of teeth. The following table gives the approximate number of cuts in an inch of file:

Length of file in inches	4	6	8	12	16	20
Rough	56	52	44	40	28	21
Bastard	76	64	56	48	44	34
Smooth	112	83	72	72	64	56
Superfine	216	144	112	88	76	64

Figs. 2 and 3 represent a

FILE CARRIER AND FILING BLOCK.

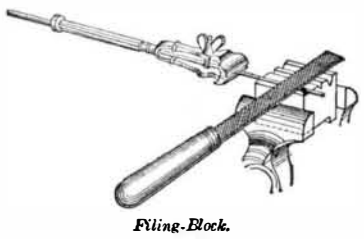
Fig. 2.



File-Carrier.

The first is a tool holder like the stock of a frame saw, and is used to mount a file in a similar manner. The file block is of suitable wood, and is gripped in the jaws of a vise. It has grooves of varying depth, in which small rods, bars, or wires may be laid, to be filed conveniently.

Fig. 3.



Filing-Block.

Fig. 4 represents different kinds of

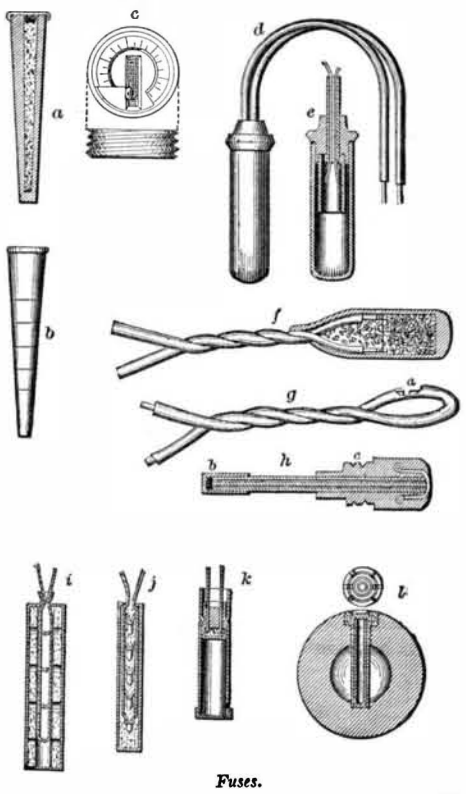
FUSES.

a b is the common wooden fuse for shells. It is filled with a slow burning composition, and for use a part is cut off at the smaller end, the amount removed regulating the length of time which the fuse burns, and consequently the duration of the period prior to the bursting of the shell to which it is attached. *c* is the Bormann fuse, which consists of a disk of an alloy of tin and lead, in which a deep channel is made to receive the composition. At the end of the channel is an aperture communicating with the exploding charge. A cap covers the disk, and is marked to indicate seconds and fractions of the same. To use the fuse, the outer covering is perforated at any desired mark, when the composition ignites by the flame from the gun passing through the aperture made, and burns until the magazine inside is reached. Bishop's electric fuse, *d*, *e*, comprises an inner and outer cylinder, protected by a perforated cap, through which the insulated conducting wires pass. *f* illustrates another form of electric fuse, in which the ends of the conducting wires are united by a fine wire of platinum. This last becomes highly heated when the current passes, and so ignites the powder. The operation of Statham's fuse, *g*, depends on the fact that a copper wire, covered for some time with vulcanized rubber, becomes coated with a layer of sulphide of copper, which is a moderately good electric conductor. This is utilized by twisting a piece of rubber-covered wire into a loop, when part of the covering is removed (at *a*) and the wire severed. Consequently, when a spark is passed along the wire, on reaching this spot it must follow the film of sulphide adhering to the rubber; and the resistance which it has to overcome causes the sulphide to ignite.

i j k illustrates Shaffner's blasting fuses and cartridges. *i* is a hollow cartridge provided with central and diverging spaces, occupied by a series of fuses and loose nitro-cotton, the whole covered with a waterproof casing, into which the ends of the conducting wires pass. In *j*, the main wires pass to the mine or cartridge, and are connected by smaller wires to the fuses, a number of which are placed in a single charge of explosive material. *k* is provided with a wooden head enclosed in an indented cylinder, closed by a cap; the head has a recess for the composition, and another for cement for the conducting wires. The Abel fuse, *h*, consists of a wooden head, into which the insulated conducting wires enter, and are covered with a tin foil cap containing the priming.

Powel's fuse, *l*, admits of being turned within the plug, which is screwed into the shell so as to bring corresponding apertures in the fuse and the plug into communication.

Fig. 4.



Fuses.

These are so adjusted to each other that the composition may be made to fire the bursting charge at the expiration of a given time.

LOW WATER ALARMS

may be classed under four heads, as follows:

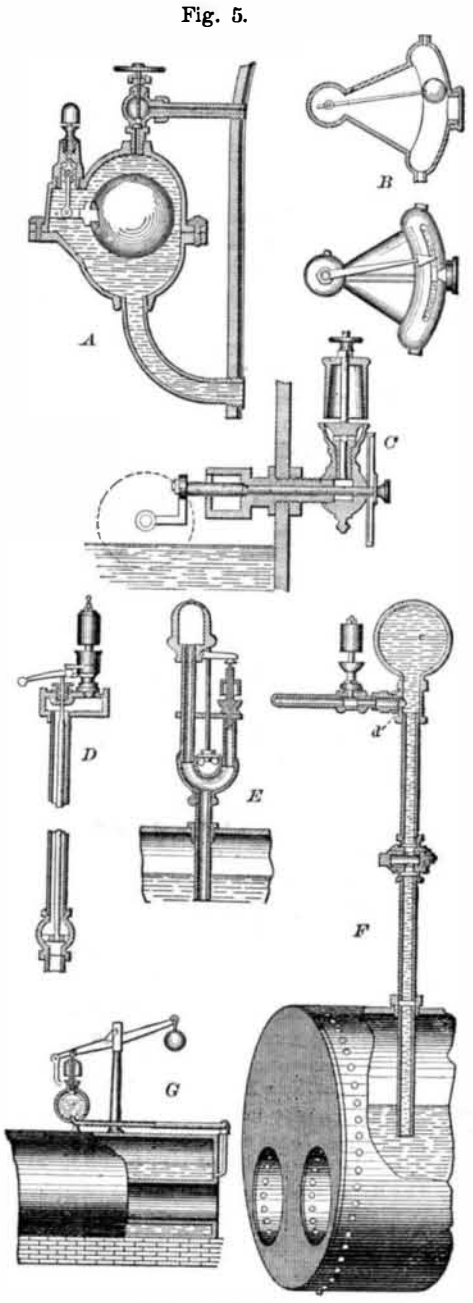
1. The float movement: A. The float is attached to an arm, and is immersed in water in the chamber which communicates by pipes with the boiler. Should the end of the lower pipe be uncovered by the subsidence of the water to that level, the water leaves the chamber and the float falls, depressing the valve and admitting steam to the whistle. When the water rises again, the upper valve is moved to allow steam to depart, and the normal condition is re-established. B. The hollow steamtight case has a central hub and a sector space, occupied by the arm of a float, which rises and falls with the changes of level of the water in the boiler. An indicator on the same axis moves with the float. C. A float is placed on the crank arm of the valve stem, and rises and falls with the changes of the water level, bringing a stud on the stem against an inclined socket, and raising the valve from its seat. This allows steam to pass to the whistle.

2. The thermostat movement: D. When the water subsides below the end of the vertical pipe, which extends downward into the boiler, the water contained therein is discharged and steam substituted. The increased heat, due to the presence of steam, elongates the thermostatic rod in the tube, and acts upon the lever to lift the valve from its seat; the steam rushes out and sounds the whistle. E. This acts similarly to the foregoing, except that the effect is due to the expansion of the steampipes when the water is emptied and steam admitted. The lever has its fulcrum on a post between the pipes; the expansion of one of the latter depresses the valve stem and withdraws the valve from its seat; the expansion of the other pipe withdraws the seat from the valve. The action of the two is cumulative. The passage of steam sounds the whistle, as in other devices for the same purpose.

3. The fusible plug action. F. After the boiler has been filled to the water line and put in operation, the pressure of the steam forces the water into the pipe and air chamber, *e*. As there can be no circulation of water in the pipe as long as the lower end of it is under the water line, the disk, *d*, will continue solid; but when the water in the boiler evaporates below the end of the pipe to the alarm water line, then the water in it falls of its own weight into the boiler, and steam at once takes its place, melts the plug, and notice of low water is given by the sounding of the whistle.

4. The gravity movement: G. A vertical pipe passes into the boiler, and its open end is at the level at which it is desired notice shall be given. This pipe forms a communication between the boiler and a reservoir on the end of a hollow arm and axis. In the normal condition this reservoir is filled with water; but when the end of the pipe is uncovered by the subsidence of the water level in the boiler, the water runs out of the reservoir and steam takes its place. The change of weight in the reservoir, due to the substitution of steam for water, causes the arm to be lifted by the weighted lever, and raise the valve which admits steam to the whistle.

Fig. 5.



Low-Water Alarms.

*Published in numbers by Messrs. Hurd & Houghton, New York city.

DECISIONS OF THE COURTS.

United States Circuit Court---District of Massachusetts.

BOILER PLASTERING.—THE UNITED STATES AND FOREIGN SALAMANDER FELTING COMPANY *vs.* THE MERRIMACK MANUFACTURING COMPANY.—THE SAME *vs.* THE LAWRENCE MANUFACTURING COMPANY.

[In equity.—Before SHEPLEY, J.—Decided October, 1875.]

The first claim of plaintiffs is for a composition for coating the exterior of steam boilers, pipes, or other heated surfaces, composed of asbestos and lime putty, charcoal, and pumicestone, or their equivalents, and is infringed upon by the defendants in their use of an inner coating of a mixture of clay and asbestos, crushed or ground, with the addition of a little hair and some other fibrous substance, with a coating composed of a mixture of clay and charred fiber, or cocoanut or cane sawdust ground, wool, or shoddy.

The second claim is for a composition, for the same purpose, of asbestos and lime putty.

This claim is infringed by defendants in their use of asbestos and whitewash (which is the same as lime putty in this composition) and clay, which is also proved in this composition of matter to be a well known equivalent for the lime putty.

SHEPLEY, J.:

These are actions at law against the defendants for alleged infringements of letters patent No. 4,134, dated September 27, 1870, reissued to the complainants as assignees of John Riley and Charles W. Bissell for an improvement in compositions for covering steam boilers, steam pipes, etc., and also for alleged infringement of letters patent No. 114,711, dated May 9, 1871, and letters patent No. 108,055, dated October 4, 1870, both to John Riley, of Troy, N. Y., assignor to the complainants, for an improvement in compositions for covering steam boilers, etc.

The reissue No. 4,134 described the essential part of the invention as consisting in the employment of lime putty, or lime mixed with water, so as to be of the consistence of glazier's putty, with some non-conducting fibrous material, such as paper pulp, and with pulverized earthy materials, which are light, porous, and are non-conductors of heat, such as plaster of Paris, water lime, cement, sand, soapstone, or black lead.

The invention described in letters patent No. 114,711 consisted in the employment of a combination of asbestos and lime putty, either with or without the other ingredients hereinafter named, as a coating for steam boilers and pipes. The other ingredients named were charcoal and pumicestone, or their equivalents.

The invention described in letters patent No. 108,055 consisted, so far as the invention related to the covering of steam boilers, in the addition of ground gypsum, or plaster, or pumicestone to the composition described in the reissued patent No. 4,134.

The defendants coat their pipes with an inner coating of a mixture of clay and asbestos, crushed or ground, with the addition of a little hair and some other fibrous substance. The next coat is a mixture of clay and charred fiber of cocoanut or cane sawdust ground, wool, or shoddy. Outside of this is a thin wash of lime with a slight mixture of hair. Outside of the second coat, in some instances, is a mass of fiber wound around the second coating. This covering of cord or fiber is covered with lime.

This coating is an infringement of the first and second claims of letters patent No. 114,711, the first claim being for a composition for coating the exterior of steam boilers, pipes, or other heated surfaces, composed of asbestos and lime putty, charcoal, and pumicestone, or their equivalents, and the second claim for a composition for the same purposes composed of asbestos and lime putty.

Defendants use the asbestos and whitewash, which is the same as lime putty in this composition, and clay, which is also proved in this composition of matter to be a well known equivalent for the lime putty. They also use the combination of asbestos, lime putty, and charcoal.

A large number of American and English patents are introduced in evidence as tending to show want of novelty. A careful examination of all these patents fails to afford any satisfactory proof that the patent No. 114,711 is void for want of novelty. The nearest approach to the composition of matter patented to the plaintiffs is to be found in the feltings or sheets of asbestos and lime, which were not plastic like the compositions of matter in the Riley patents, but were wrapped or fastened around the pipes

to boilers. These, although most nearly approximating the invention of Riley, do not anticipate it.

Judgment is to be rendered for the plaintiffs against the Merrimack Manufacturing Company, for infringement of the first and second claims of patent No. 114,711, for three hundred and fifty dollars, and against the Lawrence Manufacturing Company for seventy and forty-one hundredths dollars damages, with interest from the date of the respective writs.

[*G. E. Betton*, for complainant.
G. L. Roberts, for defendant.]

United States Circuit Court---Southern District of New York.

PATENT JEWELRY.—LEWIS J. MULFORD *et al. vs.* THOMAS D. PEARCE *et al.* [In equity.—Before SHIPMAN, J.—Decided November 3, 1875.]

The first claim to "an ornamental chain for necklaces, etc., formed of alternate closed links, A, and open spiral links, B, substantially as shown and described," is not a claim for an ornamental chain, composed of alternate closed links, without reference to the material of which the spiral link is made; but it is a claim for a chain composed of alternate closed links and open spiral links, formed of one or more coils of gold tubing, as shown and described.

The manner in which gold tubing is manufactured is well known to all persons skilled in the art, and the process thoroughly understood by the manufacturing jeweler. It would have been a waste of words to explain the method of manufacturing to a class of persons who are sufficiently informed when they are told that the link is "formed of one or more coils of tubing of the proper length, so as to form a double spring link."

SHIPMAN, J.:

This is a bill in equity, alleging an infringement by the defendants of reissued letters patent, which were issued to the complainants on February 24, 1874, for an "improvement in chains and chain links for necklaces," etc., and praying for an injunction and an account. The defendants, admitting in their answer the manufacture and sale of the patented article, deny the novelty or patentability of the alleged invention, and further insist that the patent is invalid by reason of the vagueness of the specification. The specification states that—

"The invention has for its object to furnish an improved chain for necklaces, etc., having links of peculiar construction, which enable all the links to be finished separate and then put together to form the chain. The invention consists in an ornamental chain, whereof the links are connected together by open spiral links, B, finished before being connected together, the connection being made by springing the finished links into each other in the manner described. A and B represent the links of the chain. The links A are round and closed, and are made and polished, or colored, separately from the other links. The links, B, which constitute the peculiar feature of my invention, are formed of one or more coils of tubing of the proper length, so as to form a double springlink. Into each end of the tube forming the link, B, is soldered a small shot, as shown in the drawing, which shot gives a finish to the link. The links, B, may then be colored or polished, and the chain is formed by springing the links into each other. * * * * * * * * By this construction the links may be made and finished in quantities, and the chain formed from the finished links, by springing them into each other to produce any desired combinations of the links of the same or different kinds. Finishing the separate links in this way enables them to be more perfectly polished or colored, and with a greatly diminished expenditure of labor and time, and enables the links to be put together without injuring them in the least, however highly they may be polished or colored."

The claims of the inventor are:

1. An ornamental chain for necklaces, etc., formed of alternate closed links, A, and open spiral links, B, substantially as shown and described.
2. The open spiral links B, formed of coils of tubing, substantially as shown and described.

Ornamental gold chains, formed of alternate closed links or spiral links, or of spiral links alone, have long been known. Chains composed of split rings which are sprung into each other, or into a solid link, are familiar articles, and there can be no novelty in the mere shape or form of the chain, or of the link, which is shown in the drawings of the patent. The distinctive feature of the invention does not consist in the fact that the link is spiral, but does consist in the construction of the open spiral link from a specified material, namely, gold tubing. The article which is called tubing in the jeweler's art is made by drawing a strip of gold through a drawplate, the gold strip having been placed around a copper wire in such a manner as to incase the wire. The copper wire, with the strip of gold wire around it, is then wound upon a mandrel and cut into proper lengths. The copper is destroyed by acid, leaving a hollow spiral link which is bound with wire and annealed. The wire is then unfastened, and the link, which is thus made, possesses a peculiar elasticity not affected by the annealing, is easily separated and united to another link without any injury to itself or to the solid link into which it is sprung, and constantly preserves its elasticity and shape.

The discovery which led to the invention consisted in the discovery of the fact that links made of tubing possessed a peculiar elasticity which was unaffected by annealing. The invention was the application of this discovery to the production of a new and useful result, namely, the manufacture from tubing of ornamental chains, which possess the following elements of novelty and utility:

First, all the links can be completely finished and then put together without injury to the chain, and thereby the article can be produced at a much less expense than had previously been necessary. Gold chains which are constructed in any other manner must be finished or polished or colored after the chain is completely formed, which is a difficult and somewhat expensive part of the manufacture, while, inasmuch as these links are sufficiently elastic to be united together or sprung upon a solid link without injury to any part of the chain, the separate links can be made in quantities, and completely finished and polished before being united.

Second, the elasticity of the special links is such that the chain can easily be separated by the fingers of the owner, and united in different forms and for different purposes, and reunited in the original chain without detriment to the polish of the links, and with no loss of their elasticity. As has already been suggested, their features of novelty and utility do not result from the fact that the chain is made in part from a spiral link, but from the fact that the spiral link is manufactured from a material which possesses a peculiar quality of permanent elasticity. The invention consists in the fact that, whether the inventor was or was not the first person to discover the peculiarity, he first utilized the discovery, and applied the peculiar property of the material to a useful result in the manufacture of chains.

It being self-evident that chains composed of spiral links have been well known, it was insisted by the defendants that the chains heretofore in use possessed substantially the same qualities which are attributed to the patented article; and that the patented article had no advantage over the chains which were introduced as exhibits, and which were made of gold split rings, or split links in various forms. But it was satisfactorily proved that the split rings, which are manufactured from solid gold wire compressed in dies, and made elastic by hammering, are not sufficiently elastic to permit the chain to be joined without injury to the material into which the split link is sprung, and this injury renders necessary a repolishing or finishing of the completed article. Again, if the chain of split gold links is taken apart, this act of separation causes the coil to spring asunder, so that it loses its shape and its beauty; and if a necessity of annealing arises, the process of annealing destroys its elasticity. The difference between the patented article and a chain made of split gold rings is clearly marked. It is a difference in kind and not merely in degree.

Testimony was also offered by the defendants to prove that chains of spiral links made of tubing had been in use prior to the date of the invention, but the evidence failed to satisfy me that chains of open and unsoldered spiral links made of tubing had been manufactured prior to the date of the patent. Links have been made of tubing, which, after being united in a chain, were soldered together, and thus a chain was made which could not be taken apart, and which required finishing and polishing after it was soldered together. The testimony did not show that the plaintiff's invention of the open spiral link form tubing had been practically anticipated by others.

A large serpentine bracelet made of a coil of gold tubing, to be worn upon the fore arm, and to be kept in its place by pressure, was also introduced as an anticipating device. It manifestly is a very different article from a chain, and the fact that a gold tubing was known and used in the manufacture of jewelry was conceded by the plaintiffs.

It was also suggested by the defendants that the specification does not describe the process of manufacture of the spiral link with the exactness which is requisite. The manner in which gold tubing is manufactured is well known to all persons skilled in the art. After having been compressed around copper wire, it is wound upon a mandrel; the wire is then removed by acid, and the coil of tubing, having been secured with wire, is annealed into the proper shape. This process is thoroughly understood by the manufacturing jeweler. It would have been a waste of words to explain the method of manufacture to a class of persons who are sufficiently informed when they are told that the link is "formed of one or more coils of tubing of the proper length, so as to form a double spring link."

The first claim is not a claim for an ornamental chain composed of alternate closed links, and open spiral links, without reference to the material of which the spiral link is made, but it is a claim for a chain composed of alternate closed links and open spiral links formed of one or more coils of gold tubing, as shown and described. The finish, as given to the chain by the shot at the end of the open link, is not a material part of the invention.

There should be a decree for an injunction, and a reference to a master to take and state the account.

[*B. F. Lee* and *A. A. Alvord*, for complainants.
Jos. C. Fraley and *Henry Baldwin, Jr.*, for defendants.]

NEW BOOKS AND PUBLICATIONS.

THE INTERNATIONAL REVIEW. March—April, 1876. Published Six times a year. Subscription price, $5. New York city, Chicago, and New Orleans: A. S. Barnes & Co.

To the scientific reader, the most interesting paper in this number of the above periodical is Professor Vogel's "Chemical Action of Plants," in which the invaluable assistance of plant life to mankind, in the accomplishment of many purposes which human skill and scientific industry do not, and perhaps never will, enable us to perform, is demonstrated by a variety of illustrative instances. Professor Proctor's "Essay on the Structure of the Universe" reveals no new thought, and is characterized by the same peculiarity of that astronomer which obtrudes itself in many other of his recent productions, namely, of saying little and writing much. For a scientist whose ideas have undergone such radical changes, amounting to the abandonment of previous convictions, and whose present notions may undergo like revolution in the future, it would appear safer to speculate less, or, at least, not to extentuate his thoughts through a multiplicity of books and essays. A careful memoir of Professor Cairnes, the great English political economist, is contributed by Mr. George Walker. There is an instructive article on "Bardism," and a useful paper on "The Old and the New South," beside a valuable series of reviews of recent foreign publications

THE NEW GUIDE TO ROSE CULTURE. Published Annually by the Dingee and Conard Company, Rose Growers, West Grove, Chester county, Pa. Price 10 cents.

The successful cultivators of roses who publish this interesting pamphlet have introduced a new system of supplying their numerous customers with rose trees. They send them by mail, and guarantee their delivery in good order. Thus amateurs of roses can obtain specimens of all the choicest varieties of this most beautiful flower, merely by sending a letter and post office order to the growers, as above. The New Guide is published to aid purchasers in making a selection; and it contains a complete list of all the roses now in demand, with detailed particulars. Illustrations and descriptions of other plants and flowering shrubs are added, together with other valuable information on floriculture. See a further announcement in our advertising pages.

THE EDEN OF LABOR, OR THE CHRISTIAN UTOPIA. By T. Wharton Collens, Author of "Humanics," etc. Price $1.25. Philadelphia, Pa.: Henry Carey Baird & Co., 810 Walnut street.

Mr. Collens announces, in his preface, that his design is to develop a practical plan for the application of the fundamental principle, "admitted by all political economists," that "labor is the real measure of the exchangeable value of all commodities and services," and to show that the principle and its application rest upon the duty of Christians towards God and each other. Such of our readers as may read the book will be surprised at many of its statements, and at the autocratic manner in which the author lays down his opinions; and the strange commingling of the holiest names and the most solemn subjects with inflation theories and the advocacy of paper as a source of wealth would be amusing but for its irreverence. We do not think that the currency question is to be settled by such publications as this.

THE TEXTILE COLORIST, a Journal of Bleaching, Printing, Dyeing, and Finishing Textile Fabrics, and the Manufacture and Application of Coloring Matters. Edited by Charles O'Neill, F.C.S., Author of "The Chemistry of Calico Printing, Bleaching, Dyeing, etc." Nos. 1 and 2. January and February, 1876. Subscription price $12 a year, payable in advance. New York city: John Wiley & Sons, 15 Astor Place.

This monthly publication gives promise of being a technical journal of the highest order. Its subject has long been the most interesting and progressive branch of industrial chemistry; and the rapidly extending use of chemical dyes gives additional value to such thoroughly digested and trustworthy information as this serial contains. The following articles are found in the pages of the first number: "Lime Juice, Argols, Citric and Tartaric Acids," "Methylaniline Purple on Cotton," "Straining Colors by Atmospheric Pressure," and "Sulphur as a Mordant for Aniline Green." Contemporary news as to new discoveries, patents, reviews, etc., is added; and an extended treatise (by the editor) on "The Practice and Principles of Calico Printing, Bleaching, Dyeing," etc., is commenced in this issue. The publication is illustrated with diagrams, etc., and each number contains 96 pages.

SPECIFICATION AND WORKING DRAWINGS OF A SWISS GOTHIC FRAME COTTAGE. By D. T. Atwood, Architect. New York city: A. J. Bicknell & Co., 27 Warren street.

This publication would be useful to many of our readers in the West and South, and to any one who desires to build a serviceable and elegant cottage without the assistance of an architect. The design of the structure is commendable, and the interior is especially arranged with a view to convenience; and the specification lays down the requirements for a well built and commodious house. Such usefully practical publications deserve the highest recommendation.

BURLEY'S UNITED STATES CENTENNIAL GAZETTEER AND GUIDE FOR 1876. Edited by Charles Holland Kidder. Philadelphia, Pa.: S. W. Burley, Proprietor and Publisher.

This handsome volume is a general cyclopædia, historical and statistic, of the United States, both now and during the past century. The information as to the Centennial Exposition is extensive, and apparently accurate; and the industrial statistics are elaborate and well arranged. The book is likely to have an extensive sale.

DESIGNING BELT GEARING. By E. J. Cowling Welch, Author of "Designing Valve Gearing," etc. Price 20 cents. New York city: E. & F. N. Spon, 446 Broome street.

This is a very elaborate treatise on a simple yet important subject, and will be useful to such of our readers as understand the higher mathematics.

THE CREED OF FREE TRADE. By David A. Wells. New York city: Hurd & Houghton, 13 Astor Place.

Mr. Wells commences his text with the indisputable axiom that the highest right of property is to *freely* exchange it for other property; and the truths that he deduces from this maxim are as self-evident as their source.

THE ECLECTIC MAGAZINE for March has a remarkably good table of contents. We can cordially recommend this magazine to our readers as one of the most instructive and useful of our monthly periodicals. It contains the best short papers which appear in the English monthlies, selected with great discrimination and judgment, besides one or two good continued serials. The present number has Mr. Gladstone's address on "Science and Art," Dr. Bastian's essay on "Why Animals have a Nervous System," "Her Dearest Foe" and "Jonathan" (continued), besides articles on "Montenegro," "Richelieu," "German Home Life," "The Unseen Universe," etc. The only objection to the magazine we can find is its embellishments. This month, there is a steel engraving of President Barnard, which, as a likeness, is almost as bad as a bust for which the learned and amiable scientist patiently sat during a recent American Institute Fair, to the delectation of a gaping crowd and to the furtherance of the reputation of the aspiring sculptress. If somebody would buy both plate and bust, and scrupulously destroy them, it would be a service both to Dr. Barnard and to posterity.

HARPER'S MAGAZINE for March contains an illustrated article on the Danube Principalities, which is of timely interest with reference to the recent Herzegovinian outbreak. Professor Samuel Lockwood contributes a paper on the "Microscope," written in plain and simple style and copiously embellished with engravings. George Eliot's "Daniel Deronda," the reigning sensation of the literary world, is continued; another instalment of the "First Century of the Republic" series treats of the progress of literature in this country; and there is the usual good selection of short stories, beside the summaries, scientific and otherwise, of recent events. Harper & Brothers, New York. $4 a year.

THE SANITARIAN for March opens with a lengthy paper, forming, as a lawyer would say, a "case" in favor of the use of salt for the removal of snow from the streets. All the evidence in the shape of professional opinions, *pro* and *con*, is adduced, and a preponderance appears to exist in favor of salt, a committee of the College of Physicians, among other authorities, certifying to its non-deleterious influence as regards public health. Dr. Bailey has a sensible article on "Ventilation of Churches," Mr. A. H. Dana tells of the "Uses and Abuses of Life Insurance" in a clear and concise essay, and there is an address, recently delivered by Dr. Doremus, on "Milk in its Medico-Legal Aspects." $3.00 a year. McDivett, Campbell & Co., Publishers, 79 Nassau street, New York.

Recent American and Foreign Patents.

NEW CHEMICAL AND MISCELLANEOUS INVENTIONS.

IMPROVED FRUIT DRYER.

Samuel W. Hope, Dover, Del.—This device includes a flue-shaped chamber having a heater at the bottom and a system of small tubes at the sides, for taking some of the air up around or by the trays, and discharging it into the drying flue again, between the trays, and also another system for drawing out the air from the spaces between the trays as it becomes charged with moisture by evaporation of the moisture of the fruit.

IMPROVED PAPER FILE FASTENER.

Charles D. Lindsey, Cincinnati, Ohio.—This fastener is made of a single piece of metal split for a certain distance at each end. The strip is then folded lengthwise. The split portion at one end has each extremity bent at right angles, while the ends of the other split part are sharpened. The latter are inserted through the paper and bent flat.

IMPROVED INVALID CHAIR.

Cevedra B. Sheldon, 7 State street, New York city.—Mr. Sheldon now offers another ingenious device, in the shape of an easy chair suitable for physicians' or invalids' uses. It has an adjustable foot rest arranged to be raised upon its pivots to a horizontal position, and a back to fall down on a level with the seat, to form a bed or lounge. It also folds up for storing away compactly. There is an improved contrivance of the adjusting back support, a new arrangement of the adjusting foot support, and a cane bottom for the latter. The entire chair is of very light but strong construction. Mr. Sheldon is one of the most persistent inventors we have ever known. His patents must now number in the neighborhood of fifty; and as he is yet a young man, we have no doubt but that his "centennial" invention is a future possibility.

IMPROVED BACK STRAP BUCKLE AND TRACE CARRIER.

James W. Weed, Clarinda, Iowa.—This is a simple fastening device for the back and hip straps of harness, by which the cutting and stitching of the same is obviated, and a stronger and more durable connection of the straps obtained, while it furnishes also a hook support for the traces when the animals are detached from the vehicle. It consists of an oblong device with loops at all sides, and a central vertical pin for the fastening of the crossing straps. The side loops of the hip straps are furthermore provided with T-shaped hooks or carriers for the traces.

IMPROVED LAMP TRIMMER.

Philip Sidney Lyman, Chicago, Ill.—The invention relates to the construction of lamp trimmers, so that the wick may be cleanly cut and with perfect evenness, and consists in making it with handles angled at their ends, working upon the same fulcrum, one moving in a vertical, while the other moves in a horizontal plane, and provided with cutting blades, kept in continual close contact by guides that project from one of them.

IMPROVED TRUSSED STANDARDS FOR PIANOS.

Edwin Oakley, Lerrika, Ovalan, Fiji Islands.—The object of this invention is to provide a standard which shall counteract the overhanging strain of wires and prevent curving or bending in the back of upright pianofortes. It consists in the combination with upright pieces having obtuse angular grooves, and a tapering mortise, of trusses fitting in said grooves, and a wedge fitting in said mortise, and the whole so arranged as to form a rigid and secure brace for the standards, for the purpose of resisting the tension of the wires.

IMPROVED TOY PISTOL

O. C. Butterweck, St. Louis, Mo.—The invention relates to a pistol whereby a marble may be ejected from the barrel with considerable striking force, by a rear-impelling spring that drives the piston rod forward as soon as the latter is lifted by the trigger. By the peculiar mode of combining the trigger and piston rod with the spring, the impulse is given with great facility, and without any liability of deranging the aim.

IMPROVED LIGHTNING ROD.

Isaac Johnson and David A. Price, Chicago, Ill.—The invention relates to that class of lightning rods made of tubular form and in several parts joined together. It consists in reinforcing and stiffening the tube sections with a metallic rod that does not fit up to the inside of the tube, but is maintained in a rigid and immovable position on the axial line of the outer cylinder by attachment at each end to a coupler; also in combining with each section a pair of peculiarly constructed couplers, one having a threaded socket and the other a screw, while each is provided with an opposite central recess for receiving the strengthening rod, and a conical cavity at the outer end of the recess for directing and guiding the end of the rod to its rest in the recess.

NEW AGRICULTURAL INVENTIONS.

IMPROVED PORTABLE FENCE.

Urias Crayton, Davidson College, N. C.—The invention relates to portable fences which may be employed for different cross lines at different times, and consists in causing a tapered edge of one panel to fit into a corresponding groove of the next adjacent one, thus preventing one panel from ever being forced past another by an ordinary pushing force or by a wind.

BAND CUTTER AND FEEDER FOR THRASHING MACHINES.

Godfrey L. Gearhart and Nicholas W. Hoffman, Lebanon, N. J.—This is an automatic feeding apparatus for thrashing machines, by which the sheaves are readily and evenly cut, spread, and conveyed to the thrasher without an attendant. The invention consists, mainly, of a reciprocating shaker with a side shelf, from which the sheaves are pushed on stationary fingers, arranged concavely with cutting knives to cut the bands. The stalks are dropped through the fingers and pushed forward by lateral strips of the shaker, to be then evenly distributed by vibrating rakes, and conveyed to the thrasher.

IMPROVED HAY STACKER.

Moses Amidon, Lathrop, Mo.—In using this device, a rake is drawn over the field by horses until loaded. The loaded rake is then drawn upon and then from the platform, leaving the rake load of hay within the hopper. As the rake passes from the platform the horses are stopped, and suitable arrangements are made whereby the hopper is caused to carry the hay over and discharge it upon the stack.

IMPROVED SWARM BOX.

Andrew Harbison, Newcastle, Pa.—The object of this invention is to catch swarms of bees as they issue from the parent hive, and keep them confined until at leisure to introduce them into new habitations, thereby saving much time of the attendant, risk of several swarms mingling together, and the consequent destruction of their queens, as well as the danger of leaving for the woods. The swarm box is constructed of thin light lumber, except the top, which is of wire cloth. The swarm is caused to pass through a tube extending inward and upward, at an angle of about 45°. The edges around this tube are armed with wire pickets, the object being to prevent the bees from again returning to the parent hive, as they cannot successfully pass over the wire pickets. On the sides, in the interior, there are shelves on each side for the swarm to cluster on, as a support is necessary when a swarm is to remain in the box for some time before hiving.

IMPROVED BUTTER PACKAGE.

Andrew J. Dibble, Franklin, assignor to himself and David G. Landon, Delhi, N. Y.—This inventor proposes a new butter form, constructed of a single block of wood, having conical cavity, in which the butter is packed. These forms may be packed together and transported. The inventor states that they will cost about one cent a piece; and after the butter is once packed in them it need not be disturbed until each reaches the consumer. Each form is made to receive a given weight of butter.