

THE FAIR OF THE AMERICAN INSTITUTE.

Among the novel and curious inventions exhibited at the Fair is a

HAIR HEADING MACHINE,

the object of which is to straighten out the tangled combings of ladies' hair, arranging the roots all one way. The hair is placed on a rubber pad under a vibrating dull blade which has a kind of drawing motion. The edge of the blade engages against the scales or nap of the hair and forces such as it catches in one direction or the other, to meet endless canvas belts. Upright pins on the latter encounter the hair as it is pushed from under the blade, and, catching it, carry it along, thus straightening it with the roots outward.

One of the neatest little machines exhibited is a

MINIATURE KNITTING MACHINE

made by Messrs. Tiffany & Cooper, of Bennington, Vt. It is clamped to a table and operated by turning a crank which, rotating a little cylinder, causes a spiral cam slot therein to give to the five or six needles the required motion. The cost of the device is a trifle, and it knits such articles as watch guards, curtain cord, and dress trimmings rapidly, and produces a good article.

Another small invention of merit is a

SELF-LIGHTING GAS BURNER.

In this there is a little chamber beside the burner in which is placed a roll of paper, along which are dots of a harmless compound which will take fire by percussion. The end of this roll is carried up near the orifice of the burner; and by turning the cock, the uppermost match is lighted by a slight blow, thus igniting the gas. The device works well and remains operative as long as any of the roll of paper, the end of which is constantly brought into position by very simple mechanism, remains. The cost of the apparatus is said not to exceed that of the matches ordinarily employed.

MEYERS' ROTARY ENGINE

of 50 horse power is exhibited, driven by compressed air. The working portions of this machine are remarkable for simplicity and fewness of parts as well as strength. There are in fact but three moving parts. The ring revolves on its own center in the cylinder, the piston arm is attached directly to the shaft and passes through the ring in a movable bearing; and it terminates in two flukes resting against the inner periphery of cylinder, or one fluke if the engine be single-acting. There are no eccentrics, no springs, and no cams in the engine, and the wearing pieces are all heavy and substantial. The ring is merely a secondary part, as the power goes directly through the piston to the shaft. The machine at the Fair runs readily with an air pressure of 1/2 pound. This engine will soon be illustrated in this paper.

MCCHESNEY'S SCROLL SAW

is a novelty in this form of machine. The frame is made something of an elliptical or flattened C shape. At points corresponding to the ends and middle of the C are pulleys over which pass a belt, the ends of which connect with the ends of the saw, that is, the saw and the belt together form a triangle. To the middle wheel, mechanism is attached which gives it a to-and-fro turning motion so that a reciprocating movement is thus imparted to the saw. The facility with which the latter can be stopped, and the ease with which it can be removed or tightened, render the machine a useful improvement.

Of the

NEW METAL WORKING TOOLS,

there is such a great variety that we can do no more than point out the especial novelties in those which strike us as of merit, leaving to the reader, should he visit the Fair, to make more elaborate examination for himself.

There is a bolt cutter from Messrs. Sellers & Co., in which the oil is pumped directly through the spindle. A drill grinder by the same firm has a neat device for clamping the tool, and an arrangement resembling an index wheel by which the lathe may be turned exactly over one half a revolution.

In the large collection of Messrs. George Place & Co. is a 12 inch slotting machine, which has a new cam motion and in which, instead of the ordinary wheel on top, a rod is provided connecting with a bevel gear at that point. The rod has a handle which is convenient to the workman in front of the machine. In a car wheel borer, we notice a friction arrangement for the feed, the mere turning of a hand wheel throwing the latter on or off at once. There is also a conical bearing for the table, which will doubtless give a truer wear. In a 15 inch shaper, the novelty is a quick return motion, a cam being used, instead of an eccentric, which gives return and drops immediately. An adjustable table which can be placed at any angle is the feature of a new radial drill. It is pivoted to the bed by lugs, and a turn of the pivot bolt with a wrench holds it in proper position. It turns on a circular rack in which suitable gearing operates to give desired elevation. A large table is provided at another side of the tool, to which the drill is easily swung around in doing heavy work.

There is also a three-spindle bolt cutter which opens and closes its dies automatically. The bolts are merely started in and left to themselves; when they are cut to the required depth, they strike previously adjusted mechanism which throws open the dies. This machine has also a new arrangement for the oil, so that the latter is always drawn from the top and hence is pure, not requiring frequent changing. A six-spindle nut tapping machine has its taps so held that they are self-centering, this being effected by a very short squared portion and the holding mechanism acting upon a recess cut near the upper extremity. In using the machine

it is only necessary to keep feeding nuts under the taps until the latter are full. Then, by pulling down collars, the tools are instantly released and the nuts may be readily dropped off. A new axle lathe has two changes of feed, and the clutch instead, of being at the tail of the lathe, is between the two gears. The handle is so arranged as to be always convenient to the workman wherever about the tool he may be, and there is a friction attachment acting on an expansion box, which, enclosing the tail spindle, allows the latter to be readily and quickly set. We reserve mention of other machine tools for a subsequent article.

Among the entries which merit passing mention is a very fine display of

WOODWORKING IMPLEMENTS

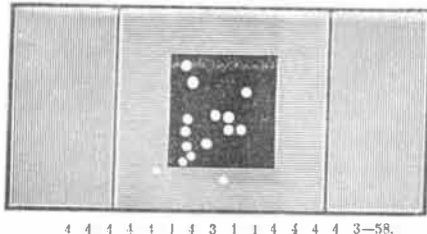
by D. R. Barton, of Rochester, N. Y., and a case of bolts from Hoopes & Townsend, of Philadelphia. These exhibits are alike conspicuous for their intrinsic merit and for the exceptional tasteshown in arranging them for show. We notice also that President Morton, of the Stevens Institute, contributes several fine mathematical and scientific instruments from the collection of that college, and that Professor Thurston is exhibiting his machine for testing the metals. Those of our readers who have profited by the Professor's very able articles on testing, strains, and similar topics, which we have lately published, will doubtless inspect with much interest this machine, now for the first time publicly displayed.

THE INTERNATIONAL RIFLE CONTEST.

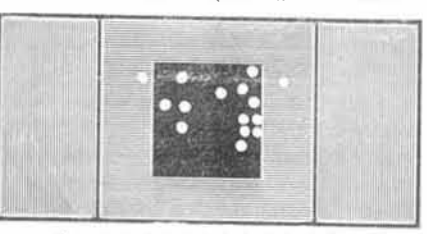
The trial of skill between six riflemen of America and six from Ireland, ended in a victory for America, the shooting on both sides being marvelous for accuracy. Two hundred and seventy shots (fifteen for each man at 800, 900, and 1,000 yards respectively) were fired on each side; and 4 points being given for each bullseye, the possible total was 1,080 to each competing team. The Irish party marked 931, and the Americans, previous to the last man's last shot, exactly tied them. Colonel Bodine was firing, and on him depended the result. He scored a center, 3 points, making a total of 934. We believe this total has never been exceeded. But the equality of the two scores was even more remarkable than this, as the Irish side lost 4 points by one marksman firing at the wrong target, on which he made a bullseye.

We give herewith diagrams of the four most remarkable scores:

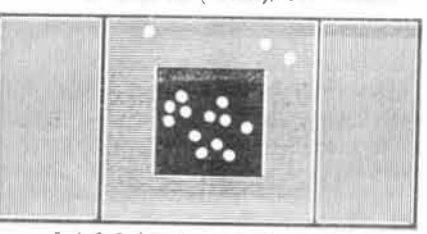
H. FULTON (AMERICAN), 800 YARDS.



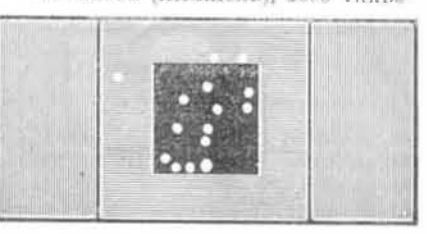
J. B. HAMILTON (IRISH), 800 YARDS.



J. K. MILNER (IRISH), 800 YARDS.



H. FULTON (AMERICAN), 1000 YARDS.



DECISIONS OF THE COURTS.

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

PATENT AIR-CARBURETING APPARATUS.—THE GILBERT & BARKER MANUFACTURING COMPANY vs. OAKES TIRRELL.

WOODRUFF, Circuit Judge: The bill herein is filed to restrain the infringement of a patent granted to J. F. Barker and C. N. Gilbert, on the 3d August, 1869, for an improved apparatus for carbureting air. By means of this apparatus, it is claimed that gas is produced from petroleum, and similar volatile oils employed for carbureting atmospheric air, thus rendering it combustible, light-producing, and suitable for lighting houses, manufactories, etc. Neither the process nor the chief parts of the apparatus are claimed to be new. The claim in the patent which the defendant is charged with infringing is in these words: "The arrangement of the carbureter with a meter wheel, said meter wheel being driven by a descending weight or other equivalent mechanical power, applied to force the air through the carbureter to the burners, said carbureter being placed within a vault by itself, separate from the building to be lighted, the whole arranged and connected with pipes substantially as herein (that is, in the specification) described and set forth. The chief feature of the improvement is in the placing of the carbureter underground, in a vault separate from the building to be lighted, at any desired or convenient distance therefrom, while the power and the motor, by means whereof the atmospheric air is forced through pipes leading into the carbureter, is placed in an apartment in the building, or near thereto, conveniently accessible with or without a light, as occasion may

require, whenever for adjusting the motive power or machinery thereof it is desired to do so.

Such apartment being thus wholly separated by walls or intermediate earth, or both, no gas from the carbureter pervades it, and no danger of explosion arises.

Three questions are hereupon raised. Was this new arrangement patentable? Was it new, and were the patentees the first inventors? Does the defendant infringe? 1. Upon the first question, it is insisted that the patentees merely changed the location of the carbureter, and that the mere change in the location of an old device is not patentable. In *Marsh et al. vs. the Dodge Stevenson Manufacturing Company*, in the Northern District, at the June term, 1873 (3 *Patent Office Gazette*, 398), I had occasion to say that "mere change of location is not invention." But it was also held that "where change of location involves the employment of new devices to adapt an apparatus for use in the new position, and a beneficial result is produced, then this location, in its connection with such new devices—that is, the means by which the result is produced—and not the result itself—is patentable. And where such change of location brings into existence a new combination of devices, operating by reason of such new combination to produce a new and useful result, such new combination is patentable."

The most important inventions ever made consist in subordinating natural elements or controlling natural laws to the production of useful results.

I cannot doubt that the invention of the patentees was patentable, as truly so as it is abundantly proved to be greatly useful and valuable.

The questions of fact: Was this arrangement new, and were the patentees the first inventors? must be answered in affirmative.

Does the defendant infringe? It was but feebly, if at all, insisted that the arrangement of devices by the patentees was entitled to be called an invention and was patented as such. The defendant did not employ its distinguishing features or characteristics. The details in the construction of his carbureter were not precisely like that used by the complainant, but those specific features were not claimed. The substantial operation of his carbureter and the mode of impregnating the atmospheric air are alike in both.

The difference between the apparatus of the defendant and that of the patentees, chiefly relied upon, is that, whereas the latter make the cavity below the ground a vault having surrounding walls, the defendant, having inserted his carbureter in the cavity, surrounds it with earth in direct contact therewith, and carries up to the surface a pipe through which to replenish the carbureter with oil, instead of having a removable opening to the vault below, employed by the patentees.

The substance of the invention of the defendant uses. The means of its effective useful operation are the same. The even, moderate temperature of the earth, the underground passage of the gas, and the effect thereof are alike used in both. The difference in the construction of the carbureter used by the patentees, as described in the drawings, may make a more permanent opening about its sides desirable, but I cannot regard these details as of the substance of the invention. The apparatus of the defendant does substantially operate by the same means, in the same way, and to produce the same result.

The complainant must have a decree for an injunction and account in the usual form.

[Stanley, Brown & Clarke, for complainant. Wetmore & Jenner, for defendant.]

NEW BOOKS AND PUBLICATIONS.

THE AMERICAN GARDEN. Edited by James Hogg. Published monthly. \$2 a year. Brooklyn, N. Y.: Beach, Son & Co., 76 Fulton street.

The October number is the second of a new series, which renders the present a favorable time to subscribe. The number before us contains a great variety of information on floriculture, hints on gardening, fruit raising, and kindred subjects, accompanied with a descriptive catalogue of Dutch bulbs, lilies, etc., appropriate to the season. Among these are many new varieties, with practical hints in their culture and management. In form and character of information, the *American Garden* is similar to the *English Garden*, and is designed to occupy the same field in this country that its namesake does in England. The information is adapted to our soil and climate, which renders it of special value to all lovers of flower culture. It contains the names and description of all new varieties of plants and bulbs, and occupies a place in floral literature opened by the advancement of American taste.

ELEMENTS OF DESCRIPTIVE GEOMETRY. By S. Edward Warren, C. E., Professor of Descriptive Geometry in the Massachusetts Institute of Technology, and Author of a Series of Works on Geometry and Stereotomy. Part I., on Surfaces of Revolution. Large 8vo., 252 pp. New York: John Wiley & Son, 15 Astor Place.

Professor Warren's books are recognized throughout the country as the highest authorities on all branches of practical geometry. His method of classifying the problems by which the whole science is elucidated is excellent, and shows the hand of a master in the difficult art of imparting instruction. Such books are needed now more than ever, when there is a worldwide awakening as to the importance of technical instruction as a branch of common school education. The book is admirably illustrated with numerous folding plates.

POLITICS AND MYSTERIES OF LIFE INSURANCE. By Elizur Wright, late Insurance Commissioner of Massachusetts. Price \$1.50. New York: Lee, Shepard, and Dillingham.

The author of this excellent treatise has added to his great reputation as an authority on this important subject. It is stated that more than 500,000 persons, chiefly heads of families, have insured their lives in the United States, depositing their money periodically in the hands of corporations who are alleged to be nearly irresponsible, while their constitutions and regulations are so complicated that persons wishing to discontinue their insurances or to surrender their policies are nearly always victimized.

THE MOTHER'S HYGIENIC HAND BOOK, for the Normal Development and Training of Women and Children, and the Treatment of their Diseases by Hygienic Agencies. By R. T. Trall, M.D., author of "The Hydropathic Encyclopædia," etc. Price \$1. New York: S. R. Wells, 389 Broadway.

Dr. Trall is well known as the author of various excellent works on hygiene. His views on diet, regimen, and dress are sound and generally acceptable.

ON THE STRENGTH, ELASTICITY, DUCTILITY, & RESILIENCE OF MATERIALS OF MACHINE CONSTRUCTION, a Paper read before the American Society of Civil Engineers. By Professor R. H. Thurston, Stevens Institute of Technology, Hoboken, N. J. New York: D. Van Nostrand, 23 Murray street.

A reproduction of several articles, of the highest interest and value which have already appeared in our columns.

THE WESTERN PHOTOGRAPHIC NEWS, a Monthly Magazine of Photographic Art. Vol. I., Nos. 1, 2, 3. Chicago, Ill. Charles W. Stevens, 158 State street.

This periodical contains much news, domestic and foreign, as to the photographer's art, and some valuable recipes and practical directions.

CINCINNATI INDUSTRIAL EXPOSITION CATALOGUE (German Edition). M. & R. Burgheim, Cincinnati.

EIGHTH ANNUAL REPORT OF THE MASTER CAR BUILDERS' ASSOCIATION. New York: S. W. Green, 16 Jacob street.

Inventions Patented in England by Americans.

- [Compiled from the Commissioners of Patents' Journal.]  
From September 8 to September 17, 1874, inclusive.
- ANGLE BRICKS.—J. E. Billings, Boston, Mass.
  - BUTTON HOLE SEWING MACHINE.—H. E. Townsend, Boston, Mass.
  - CAR WHEEL.—E. B. Meatyard, Geneva Lake, Miss.
  - CLEANING GRAIN, ETC.—G. E. Throop, Syracuse, N. Y.
  - DESIGNS ON FABRICS.—W. Engetsdorff (of Chicago, Ill.) London, Eng.
  - DRIVING SEWING MACHINES.—J. Proctor, Boston, Mass.
  - GOVERNOR.—C. C. Jenkins, Philadelphia, Pa., et al.
  - IRONING HATS.—R. E. Brand, Plainfield, N. J.
  - LEATHER ROUNDING MACHINE.—H. F. Osborne, Newark, N. J.
  - MACHINE GUN.—W. B. Farwell, New York city.
  - MATERIAL FOR WELDING IRON, ETC.—H. Schierloh, Jersey City, N. J.
  - PORTABLE GAS APPARATUS.—W. F. Browne, New York city.
  - PRINTING TELEGRAPH.—G. W. Howe, Stevenson, Ala.
  - PULPUSION OF VESSELS.—P. S. Devlan, New York city.
  - RAISING COAL, ETC.—J. L. Bates, New York city.
  - SEWING MACHINE.—H. P. Garland, San Francisco, Cal.
  - SEWING MACHINE.—W. S. Guinness (of New York city), London, England
  - SURFACING METALS.—L. Bollman, Vienna, Austria.
  - WASHING MACHINE.—W. Scott et al., Chicago, Ill.