

A NEW CHROMATROPE.

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There are a number of phenomena, related more or less to that illustrated by the seven-colored rotating card known as Newton's disk (phenomena, in other words, involving the composition of colors and persistence of vision) which it would be desirable to illustrate by means of a transparent apparatus and a magic lantern, rather than by an opaque disk of large size viewed directly. In fact, for twenty years or more, Duboscq has been making several chromatropes of this character. One of these consisted of a Newton's disk made of sectors of colored gelatin, mounted between two thin disks of glass, which were rotated by a small central pulley, over which passed a barrel moved by a large driving wheel. Another consisted of two disks so painted as to produce by their opposite motion the appearance of undulatory movements in certain spots of light. These were driven by a cord carried continuously round the driving pulley and both the device disks. This chromatrope, when rapidly moved, developed by persistence of vision a figure of luminous chainwork, in a way which illustrated the phenomenon of persistence of vision very satisfactorily. Another of these chromatropes illustrated Faraday's observation of the toothed wheels rotating in opposite directions. While all of these were good of their kind, there yet remained something to be desired, as regards rapidity of rotation, solidity of machinery, and clearness of vision.

Wishing to employ many of these and other illustrations at a lecture on color which I delivered at the Academy of Music in Philadelphia, I applied to Mr. George Wale, of the firm of George Wale & Co., instrument makers to this institution, and he made for me the instrument which I have found very admirable in its effectiveness and durability, and will now describe.

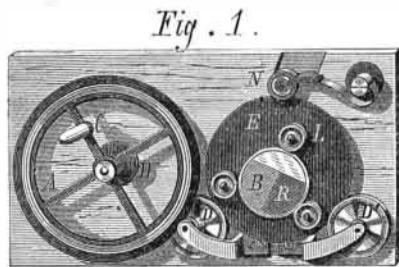


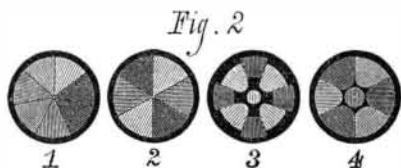
Fig. 1 shows the arrangement of parts, with an addition to be presently described.

The large wheel, A, is made of brass, with a rectangular groove on its periphery, into which is sprung a flat ring of thick sheet rubber. This gears by friction into the smaller part of the pulley, D, and this gives to it a high velocity. C is a handle and H the axis, clamped in a slot in the frame so that it can be brought nearer to D to increase the driving friction.

The chromatrope disk rests on the larger part of this same pulley, and also on the other two pulleys, D and N. It is thus readily driven at a high speed by its edge, the grooves of the pulleys in which it rests being covered with thin sheet rubber.

The entire field of the chromatrope is thus clear and unobstructed by any belt, pulley, or the like. In order readily to change the design disk of the chromatrope, the pulley, N, is held by a spring and can thus be pushed back so as to release one disk and admit another.

The design disks used in this apparatus may be multiplied indefinitely, but those at present supplied are the following:



1. Newton's color disk. This consists of seven sectors, red, orange, yellow, green, blue, indigo, and violet respectively. This and the other color disks are made of pieces of stained glass, cemented with Canada balsam to a disk of plate glass, and so admirably fitted that the effect on the screen, even, is of the most perfect finish. Their richness, regularity, and accuracy of color surpass anything which has ever been produced by painting.

2. Disk illustrating Young's theory. Six sectors of red, green, and violet are here arranged, and when rotated they produce white.

3. Disk illustrating Young's theory, Professor Rood's design, showing that green and violet produce blue. This consists of various partial sectors, arranged as shown in the accompanying engraving, Fig. 2, third circle. Here we have a number of sectors, of which the large are colored green and the smaller violet. The shaded portions are black. When such a disk is rapidly rotated, we have on the outside a ring of green, so far as to the portion where the violet sectors begin; then we have a ring where both green and violet occupy the field in succession, and thus by persistence of vision blend and give their resultant impression; lastly, where the green sectors end, we have a circle of simple violet. In the case of this disk, the combined color obtained by the union of the green and violet is a light sky blue.

4. Disk illustrating Young's theory, Professor Wood's design, showing that red and green produce yellow. This is arranged on exactly the same principle as the previous one, except that the smaller partial sectors are made of red glass in place of violet.

5. Disk illustrating the fallacy of Brewster's theory. Professor Rood's design, showing that blue and yellow do not produce green. See Fig. 2, fourth circle.

This resembles the foregoing, except that the eight sectors are entire, and consist alternately of blue and yellow glass, and when rotated produce white light.

6. Disk illustrating persistence of vision, being the present writer's design of the chameleon top.

This is shown in position in Fig. 1. The disk, E, is of hard rubber, with an opening eccentrically placed, over which is supported, between three small pulleys, L, the glass device disk, B R.

If, while this disk is rapidly rotating, the finger is made to touch lightly the little wheels at a single point of their revolution, it will cause them to move slightly so as to rotate the device disk, R B W, very gradually. This is placed, as we have seen, eccentrically to the large disk; and having on it the irregular design shown in Fig. 3, in which R is red glass, B blue, and W white or transparent, it will, by the slow rotation described, have one color after another shifted into the center of rotation of the large disk, and also the combination of colors in circles outside of the center will be changed. Thus: Suppose, in the first case, that the position

Fig. 2.

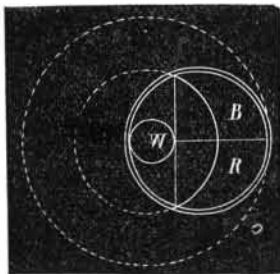
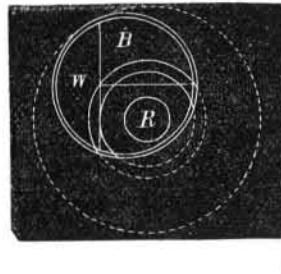


Fig. 4.



of the disks is indicated by Fig. 3, the largest dotted circle representing the large disk, and W, B, and R being the white, blue, and red parts of the device disk. In this case the white occupies the center of the large disk, and thus the rotation of this leaves the portion included in the small central circle always white. Outside of this, however, it is evident that, in the ring between this smallest circle and the next one, white, red, and blue will be carried in succession by the rotation of the large disk over the field, and thus, by persistence of vision, a blending of these three will occupy this ring-shaped space. Moreover, since the proportion of the colors will vary concentrically, this will not be a flat, but a shaded ring. Thus, just beyond the smallest circle white will predominate, while just inside the next circle there will hardly be any white.

Again, between this second circle and the outermost, there will be a similarly graduated ring, red and blue with no white.

Now suppose the small disk to rotate so as to shift the red portion into the center of the large disk, as shown in Fig. 4. Here evidently, when the large disk rotates rapidly, we shall have, by persistence of vision, a red center within the small circle; between this and the next circle a ring of combined red and blue; then a narrow ring of red, blue, and white; then a broad graduated ring of blue and white.

The shifting of the center is of course accomplished gradually, and thus the figure on the screen passes imperceptibly from change to change in countless variety, and with a beauty of effect that hardly admits of description. The prominent idea suggested to most is that of an ever-opening and changing morning glory, or of a fountain of light and color, from whose center wells out a succession of colored waves, chasing each other outwards until they are lost on the margin of the basin.

At the suggestion of Professor C. A. Young, of Dartmouth College, a further development was given to this chromatrope. The pulley wheel, D, in place of having one groove to drive the glass disk, was made a little broader and furnished with two grooves. The outer one was cut a little deeper than the other, so that it would act as a wheel of less radius and communicate a slightly lower velocity to the glass disk it drove. The other pulleys, D' and H, were each made of two independent wheels.

Two disks, being placed in this arrangement, would therefore rotate in the same direction with high but slightly unequal velocities, so that one would, as it were, travel slowly over the other. The inner one of these disks was painted with a design, and the outer made part black and part white (that is, clear). The clear part, exposing in succession different parts of the design, produced corresponding changes in the persistence-of-vision figure developed. The simplicity of the means by which this result was obtained is a very admirable characteristic of the plan.

Other designs have been made by Professor MacCord, of the Stevens Institute, for driving disks in opposite directions, and indeed this fundamental idea of Mr. Wale, of driving the device disks directly by friction on their edges, seems to open the way for quite a number of developments of this piece of apparatus.

Cleansing Goods by Naphtha.

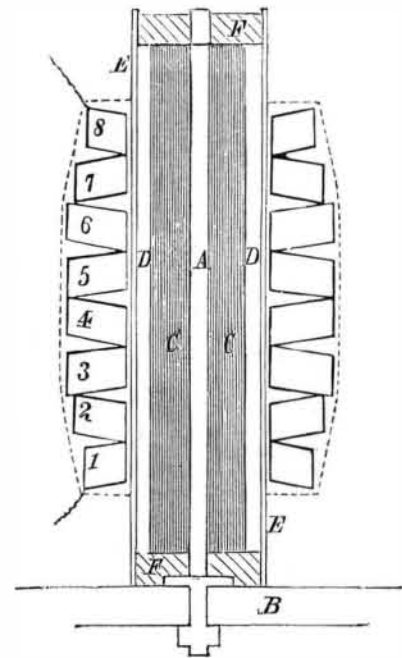
Naphtha is being used as a cleansing agent for furniture, carpets, clothing, etc., at an establishment recently opened in this city. The process consists simply in placing the article to be cleaned in a bath of the hydro-carbon and there leaving it for a couple of hours. Huge vats are used, capable of holding several barrels of naphtha at a time; and in these, sets of furniture or rolls of carpet are secured so as to be entirely submerged in the liquid. No preparation of the goods is necessary, and the naphtha seems to exercise no deleteri-

ous effect upon varnish or gilding, upon glued joints, or upon the finest silk or satin fabrics. Dirt and grease are entirely eradicated, the latter sinking to the bottom of the vats, from which it is from time to time removed in the shape of a thick yellowish mass. Moths are of course totally destroyed.

Several fine sets of furniture were shown us, which had been treated by the naphtha process. They appeared like new so far as the fabrics were concerned, and there was no discernible smell of the fluid. The process is patented. The principal item of expense is the evaporation of the naphtha; but this being allowed for, the cost of cleansing is somewhat less than that incurred in the ordinary method followed by the clothes-scouring establishments. It may be added that naphtha does not act upon linen or cotton, and is practically available only upon animal fibers.

A NEW INDUCTION COIL.

Mr. C. F. Brush, M. E., communicates to the *Engineer and Mining Journal* a description of a novel induction coil designed by him, an engraving of which, in section, we give here with. The three eighths inch iron rod, A, is secured by a collar and nut in the base, B, and serves as a support for the core, C, which is composed of about 1,200 iron wires (No. 20 gage) made perfectly straight and carefully annealed. This core is covered by four layers of paper saturated with paraffin, then one layer of the primary wire, D, which is of copper one eleventh inch in diameter and 90 feet in length, then six layers of paper, and, finally, the second layer of wire. The latter is not covered but is wound with a narrow strip of paper between the consecutive turns, the object of this being to economize space. A hard rubber tube, E, incloses the primary wire, and is 12 inches long, 2 1/4 inches in internal diameter, and 1/4 inch thick. It is held by the pieces of wood, F, which also support the core. The secondary wire is 30,000 feet in length, is wound in eight sections, 1, 2, 3, 4, etc., and covers 8 inches of the tube, as shown. Sections 1 and 8 contain 35 layers of wire each; sections 7 and 2, 55 layers each, and sections 3, 4, 5, and 6, 67 layers each. This arrangement places most wire around the middle portion of the core, where its inductive force is greatest. The consecutive layers of wire in each section are insulated from each other by ten thicknesses of unsized paper saturated with melted wax; and the consecutive turns of wire in each layer are insulated from each other by being wound with a space of one two-hundredths of an inch between them. The wedge-shaped space between the sections is filled with paraffin, which insulates them, and the exterior of the sections is also covered with the same material, until the shape of the apparatus becomes as shown. The secondary wire begins with section 1, and forms the outside layer first; thence it passes from layer to layer until the innermost one is reached, there it crosses over to section 2, where sections 1 and 2 touch each other, and forms the innermost layer of section 2, thence from layer to layer until the outside one is reached; thence it passes to section 3, forming the outside layer first, and thus it proceeds until it ends in the outside layer of section 8.



The advantages of this arrangement, as regards economy of space, is obvious. No insulating material being required between the sections, where the wire passes from one to the other, none is used. But as the quantity of wire, and consequently the tension of the induced electricity, increases directly as the distance from this point toward the opposite edges of any two contiguous sections, so the thickness of paraffin increases until finally it is thickest of all where insulation is most needed. A space of one eighth of an inch between the innermost layer of the sections and the tube, D, is filled with melted paraffin, which, together with the rubber tube itself, forms the insulation between the primary and secondary wires.

The object in using the secondary wire bare is economy of space. It is a matter of the greatest importance that the whole of the secondary wire be placed as near as possible to the magnetic core, E, as the inductive force of the latter varies inversely as the square of the distance from its axis. The same amount of silk covered wire would occupy at least double the space, and would, consequently, average a much greater distance from the core.

The condenser used with this coil consists of two hundred and forty sheets of tinfoil, five by ten inches, arranged in the

usual manner, and separated by single sheets of varnished paper. The break piece is Foucault's automatic, in which the rupture of the current occurs at the surface of mercury covered by a layer of absolute alcohol. It is operated by a separate electro-magnet, which, however, is in connection with the primary wire of the coil. The instrument is provided with a communicator by which the primary current is started, stopped, or reversed at pleasure.

The performance of this coil is quite extraordinary for an instrument of such small size. When operated with two cells of Bunsen's battery, it gives sparks three and a half inches in length; and with one large cell of the Grenet battery, three inch sparks are obtained. The sparks are very dense, and are attended with numerous and brilliant ramifications.

DECISIONS OF THE COURTS.

United States Circuit Court.—Eastern District of Michigan.

PATENT HOTEL REGISTER.—CHARLES L. HAWES vs. WILLIAM W. ANTISEL. [In equity.—Before Longyear, J.—February, 1875.]

In order to defeat a patent on the ground of want of novelty, the proof of prior use or previous knowledge must be such as to establish the fact clearly and satisfactorily, and beyond a reasonable doubt. Where the proofs are contradictory, mere preponderance is not sufficient to sustain the allegation. The preponderance in such case must be such as to remove all reasonable doubt.

To doubt in such a case is to solve the question in the negative. Letters patent No. 63,889, for a new and useful Hotel Register, granted to Charles L. Hawes, April 16, 1867, sustained.

The invention in question is what is commonly known as the "advertising hotel register," the book being constructed so as to have inserted advertisements at the top and bottom and on the margin of each page, with a blank space for the registering of names of guests, or on each alternate page, leaving the opposite page blank for registering of such names, or on both pages of each alternate leaf, such leaf being sometimes made of bibulous or blotting paper.

The proofs showed that the complainant perfected his invention and put it into practical use as early as in May, 1866, and it was to that date the proofs as to prior use and previous knowledge related.

No advertising hotel register book purporting to antedate complainant's invention was put in evidence. Such a book, duly verified, would be the best evidence possible. Each page would be an intelligent speaking unimpeachable witness to its own chronology, and the book itself the best evidence of the date of its use. The case is left to stand exclusively upon the recollections of witnesses, and at a distance in time from eight to twenty years, and unaided in any single instance by any contemporaneous memorandum or writing whatever. I shall recur to this peculiar aspect of the case in another part of this opinion.

The places where and the persons by whom such prior use and previous knowledge are alleged to have taken place, and as to which proofs have been made, will be taken up in the order in which they were alleged in the amended answer.

1. Prior use in the Exchange Hotel at Sturgis, in the State of Michigan, by E. W. Pendleton.

Pendleton, with five others, testify to the use of an advertising register in the hotel named prior to May, 1866, namely, in 1864 and 1865, and nine witnesses testify to the contrary. That registers of some kind were used in that hotel during the years 1864 and 1865, and that advertising registers were used in it after May, 1866, the testimony on both sides is entirely agreed. The vital question is whether a register was used in 1864 and 1865, and advertising registers, or, what is the same thing, whether the conceded use of advertising registers commenced in that hotel before May, 1866.

As to this question, the testimony is in direct and irreconcilable conflict. The testimony was taken at a distance of time from eight to ten years.

The witnesses on both sides testify from memory alone, unaided by any memorandum or writing whatever of the fact itself, or of concurrent facts. The uncertainty of memory as to dates, under such circumstances, is well understood; and where, as in this case, the event in question was one not calculated to fix itself in the memory of the persons called to testify, except Pendleton, on account of any interest it was to them, and those persons have equal means of knowledge, are of equal credibility, and apparently of equally sound memory, and they positively disagree, it may well be said, in case like the present, that prior use is not made out in that clear and satisfactory manner requisite, as we have seen, in such cases.

2. Prior use in the Michigan House, at Tecumseh, in the State of Michigan, by Mrs. W. H. Hoeg.

Four witnesses testify to the use of an advertising register at the place named in 1855, and five, including the then clerk or manager for the proprietor, George R. Southworth, testify to the contrary. Southworth certainly had better means of knowledge, and would be more likely to remember what the fact was, than any of the witnesses testifying to such use at the date mentioned, except perhaps the witness Spafford, who testified that he, being a binder, procured the printing done and himself bound the book and put it into use there while he was in charge of the hotel during a temporary absence of Southworth. But Southworth was absent only two or three months, and Spafford testifies that the register so put there by him continued to be used there after Southworth's return. So that if there ever was such a register at the time specified it was there when Southworth returned and resumed the management of the hotel; and he testifies positively that there was no such thing there. He describes what he says was the only book used in the office in his knowledge, and that was not an advertising register, or, in fact, a register at all as commonly understood. He describes it as simply a book in which the names of guests were entered by the clerk and a minute kept of what they had at the hotel. The other four of complainant's witnesses corroborate Southworth both as to the fact that no advertising register was used there during the time mentioned by Spafford and as to the description of the book that was used.

In such a conflict of testimony perhaps nothing more need be said than that the case is such that there is such a want of clear and satisfactory proof of prior use and, to say the least, that it is involved in so much doubt that, under the rules laid down, it must be held that the allegation of prior use at Tecumseh is not made out.

The proofs showed that the hotel building in question was consumed by fire in 1858 with its contents. The absence of the register or book used there at the time specified (1855) is therefore satisfactorily accounted for.

3. Prior use in the Bentley House, at Dexter, in the State of Michigan, by Nelson J. Alport.

Alport, with eight others, testify to the use of advertising hotel registers in the place named prior to 1866, namely, in 1863, 1864, and 1865, and eight witnesses testify to the contrary. As in the instance of the alleged use at Tecumseh, so here, the hotel was destroyed by fire after the alleged prior use, and the two register books claimed to have been so used there are represented to have been destroyed with the hotel. So that here, as in both the preceding instances, the case is left to stand exclusively upon the recollections of witnesses as to both the fact and the dates, and in this instance at ten and eleven years distance in time.

The conflict of testimony is not whether there was or was not a register or book of some kind used at each of the hotels in question during the periods of time covered by defendant's testimony, for the witnesses on both sides are all agreed that there was; neither is it as to some of the places, as at Sturgis and Dexter, that there was or was not an advertising register used at some time by the person named in a hotel kept by him, for as to this the witnesses are all agreed that there was. The conflict is simply as to the description or kind of register so in use at such prior periods of time, and, in respect to Sturgis and Dexter, as to the time when they saw an advertising register in use there in a hotel kept by the persons named—whether in 1867 or from one to three years earlier. One set of witnesses testify in the one case that the register so used was an advertising register, and in the other case that it was at the earlier date the advertising register was used; and the other set describe the former as a plain register, and that the latter was used at the later date. Each set testify to an affirmative equally with the other, and neither has any advantage over the other under the rule laid down in *Stitt vs. Huldekopers*.

Upon the whole consideration, it results that there must be a decree for the complainant according to the prayer of his bill.

Decree accordingly. [J. J. Allen, W. W. Taylor, and E. C. Walker, for complainant. Moore and Griffin, for defendant.]

Recent American and Foreign Patents.

NEW AGRICULTURAL INVENTIONS.

IMPROVED PLOW.

Irvin Freeman, Corpus Christi, Texas.—This invention relates to a shovel or subsoil plow, and consists of a hook rod attached thereto, and a lever having a pawl that works in a beam rack. This mode of fastening a subsoiler or shovel to a skeleton frame is found in practice to be very convenient, and a great labor-saving device.

IMPROVED HARROW.

William Frank, Mound Station, Ill.—This invention relates to certain improvements in harrows, and it consists in three equilateral triangular frames, constituting a sectional harrow in which the parts are capable of use either singly or collectively, and with either angle for the front. The invention also consists in the peculiar construction of the draft attachment and the means for coupling the sections together.

IMPROVED CORN HUSKER.

William Allen Dick, Cleves, Ohio.—This is a kind of pod angershaped tool, with a pointed top a little in advance of the cutting lip arranged on a horizontal revolving axle, in combination with a sliding table to feed the corn ears up to the tool. The object is to remove the shucks without the loss attending the old methods, and to leave them prepared for use without the stubs.

NEW CHEMICAL AND MISCELLANEOUS INVENTIONS.

IMPROVED CIGAR BOX.

Charles S. Brown, Baltimore, Md.—The object of this invention is to provide a cigar box better adapted to preserve the cigars from dampness, and so constructed as to allow the quality and brand of the cigars to be inspected without opening the box or breaking the revenue stamp. It consists in a tight sheet metal box, having its end walls slightly elevated and formed into beads, in combination with a glass cover contained into a suitable frame, which, when the box is to be shut, closes in between the said beads, which clasp and firmly secure the cover so as to render any other form of fastening unnecessary.

IMPROVED OPERA CHAIR.

Ira Chase, New York, and George M. Ball, Green Point, N. Y.—The new feature in this device consists in telescopic braces attached to the lower part of the support and to the edge of the seat. These fold back out of the way when the seat is turned up, and at the same time form a strong and durable support.

IMPROVED HUNTING JACKET.

Henry L. Daigre, Alexandria, La.—This coat contains the requisites for hunting, distributed in a neat and convenient manner over the body. In the skirts are game pockets, having side gussets and bottom nettings. Within the game pockets are separate pockets of smaller size for the empty shells. The game pockets have covering flaps, which may be thrown up and attached to buttons for exhibiting the result of the day's sport.

IMPROVED EGG CARRIER.

Wendelin Weis, St. Paul, Minn.—This inventor proposes to cheapen and simplify egg-carrying devices by doing away with the hinged covers or sheets which separate the horizontal trays and providing the lateral partition strips of the egg cells with broad bottom and narrow top extension pieces that serve to support the eggs in an equally secure manner.

NEW WOODWORKING AND HOUSE AND CARRIAGE BUILDING INVENTIONS.

IMPROVED WAGON WHEEL SCRAPER.

Norton Sage, Pekin, Ill.—In order to keep the tires of wagon wheels free from sticky mud, in this invention there is provided a bent iron bar attached to the rear axle, and having at its outer end U-shaped scrapers, which accommodate themselves to the rim of the wheel, no matter in what position the latter may be.

IMPROVED SCROLL-SAWING MACHINE.

Jerome H. Plummer, Brooklyn, N. Y.—The new features in this machine are a reciprocating saw frame (attached to a table extension) and slotted arms above and below, which serve as guides for the frame. The extension has a curved arm, which supports a sheaf for holding tools. The machine in general is compactly built and well adapted for foot power.

IMPROVED CHILDREN'S CARRIAGE.

Ernst Krueger, New York city.—This relates to a novel and ingenious construction of the body, which has a flexible bottom stretched by lazytongs frames. The axles are similarly extensible, and the whole is adapted to be folded in its longitudinal axis so as to be conveniently packed for storage, etc.

NEW MECHANICAL AND ENGINEERING INVENTIONS.

MACHINE FOR PACKING TOBACCO IN BOXES.

James B. Farrar, Cary, N. C.—This invention relates to an improved machine for filling and packing bags or packages of smoking tobacco. It consists in an intermittently revolving belt provided with seats in which the bag holders are placed, containing the bags and the bag shapes. As the belt revolves, the flared ends of the bag shapes pass beneath an automatic and adjustable feeding apparatus, which delivers into the bags a requisite amount of the tobacco. The bag holders and bag shapes then pass in their seats in the belt from the rotation of the latter beneath two vertically moving plungers, one of which settles the tobacco in one bag shape, while the other packs the tobacco in the preceding bag. At the same time that the packing plunger descends, two lifters automatically rise and withdraw the bag shapes, leaving the filled bags and bag holders to be removed, and the latter prepared for insertion at the other end of the belt.

IMPROVED CAR COUPLING.

John H. Johnson, Brooklyn, Mich.—The new feature in this is a fulcrumed side lever attached to a vertically swinging drawhead, which last may be set and worked at any height for coupling. There are also devices to prevent the escape or detaching of the links.

IMPROVED LEVER POWER.

Henry C. Bell, Edina, Mo.—A vibrating lever is provided with notches or sockets, adapted for receiving the links or chains which pass around the object to be raised. The lever is suspended and vibrated on a central pivot, so that the hoisting chains are alternately slackened and subjected to strain, each chain being shortened when slack. The operation of alternate slackening and straining is continued until the shortening of the chain has raised the object to the desired height. This application of power is utilizable in a large number of ways.

IMPROVED DEVICE FOR CHANGING SPEED.

Joseph W. Mead, Dupont, Ind.—Instead of the cone pulleys and belts now in use, a conically faced disk is proposed, located on the driving shaft that transmits the power by conical friction wheels to a similar conically faced disk of the shaft to be driven. The shaft of the friction wheels are hung to boxes of a sliding and spring acted frame, and the wheels are adjusted by suitable lever mechanism.

IMPROVED SEWING MACHINE.

Josiah Glines and Noel W. Stiles, Postville, Iowa.—The novelty here is a shuttle carrier mounted on a pair of cranks, and operated by a crank on the driving shaft in such a manner that the shuttle travels in a true circle without revolving on its own axis, and thus does not twist the thread. This invention is one of considerable importance to sewing machine manufacturers, and we would especially commend it to their attention. The effect of swinging the carrier in a circular orbit, without revolving it, not merely avoids twisting the thread, but also saves friction and prevents noise. The mechanical device used is at once ingenious and effective.

IMPROVED TOBACCO-CUTTING MACHINE.

Augustus A. Hagen, New York city.—For cutting tobacco in a rapid and easy manner, this inventor suggests a new machine having a cutting knife, to which a diagonal shear cut is imparted by a compound slide mechanism.

IMPROVED NUT FASTENING.

Robert C. Watson, Maysville, Ohio.—An eye stud is formed on each end of one of the fish bars, to receive one end of a locking plate. Said plate has holes to fit over the nuts, and its other end is connected at the middle of the joint, where it meets another similar plate fastened to the other end of the fish plate. The two plates are fastened on the stud by a split key, so that they can be readily put on and taken off.

IMPROVED WINDMILL.

John Cook, Harlem, Ohio.—In this the crank-shaft bearing is connected to the horizontal beam which supports the machine in a simple and efficient way by means of stirrups or yokes. Another new feature is a joint in the beam for the tail vane to swing around out of the wind when it blows too strong, in combination with a weighted lever for keeping the vane in the wind.

NEW HOUSEHOLD ARTICLES.

IMPROVED FLUTING IRON.

W. F. Fisher and A. C. Brown, Bremond, Tex.—The invention consists in a hollow smoothing and glossing iron, in which a fluting iron is inserted, the latter being also hollow to adapt it to receive a heating block, so that the several parts may be, so to speak, nested, thus economizing space, material, and the cost of manufacture, and combining several implements in one.

IMPROVED CARRIAGE CURTAIN FIXTURE.

Daniel R. Knight and John M. Ripple, Waynesborough, Pa.—This invention relates to certain improvements upon the carriage curtain fixture for which letters patent No. 166,114 were granted July 27, 1875; and it consists in the improved construction of the roll, the method of attaching the curtain thereto, a stop device for adjusting and regulating the height of the curtain, and the means for fastening the sides of the curtain.

IMPROVED LANTERN.

Patrick J. Clark and Joseph Kintz, West Meriden, Conn.—A yoke attached to a metal cap above the globe holds the latter to the lantern, while allowing said globe to rise and fall. There are new devices for concentrating the air on the flame, and for the ready admission and securing of the burner. The invention is quite simple and easily constructed.

IMPROVED PAN.

John C. Milligan, South Orange, N. J., assignor to Lalance & Grosjean Manufacturing Co., New York city.—The object here is to enable pans to be made of thinner and lighter metal than is ordinarily the case, without detaching from the wearing quality, and also to increase the capacity of the utensil. The middle portion of the bottom has a downward deflection, and, on the part outside of this, legs or studs are attached.

IMPROVED FOLDING CRADLE.

John Weich and John Jefferys, New York city.—The bottom of the cradle is hinged to one side so as to turn up. The ends are each made in two parts hinged together, and are also hinged to the sides. The rockers are pivoted at one end, and secured at the other by movable pins. With this construction the cradle may be folded so as to require but little space, and be compact in form.

IMPROVED CURTAIN FIXTURE.

Rudolph J. Pospisil, Chicago, Ill.—This is a curtain roller turning in spring brackets, bearing on its ends, and having cords wound in opposite directions around each end, to raise and lower the rollers. The cords are guided in front hooks of the brackets. An illustrated description will be found on page 306 of the present volume of the SCIENTIFIC AMERICAN.

IMPROVED STOVE.

Robert S. Bostwick, Jackson, Mich.—The air passes upward between the fire pots, from side channels into an air chamber, and then mixes with the smoke and fire gases from one fire pot. The sheet of air that is thus supplied to the top of the fire produces the more thorough combustion of the fuel and a higher degree of heat. The unconsumed smoke and gases of combustion are conducted by suitable passages downward to pass between cap and fire pot, and then in upward direction to the chimney.

IMPROVED FOLDING CHAIR.

James H. Bean and Richard W. Box, Pulaski, N. Y.—In this chair the seat, which is pivoted to the back part, and the hind legs slide between the front legs for folding. The hind legs rest by projecting side lugs on the front legs, when the seat is thrown in position for use. This is a simple and strong article, easily packed and well suited for camp use.

IMPROVED CURTAIN FIXTURE.

George C. Mathers, Louisville, Ky.—This invention is an improvement upon that for which a patent was granted to the same inventor February 16, 1875. The improvement consists chiefly in arranging on the same axis both the friction pulleys over which the cord passes, and in locating them above the grooved pulley which is attached to the end of the curtain roller. The result is an economy in the construction of the fixture, and the cord is brought nearer the wall or window casing, thus rendering its operation easier, and the appearance of the fixture more attractive as a whole.

NEW BOOKS AND PUBLICATIONS.

APPLETON'S AMERICAN CYCLOPEDIA, VOL. XIII, "Palestine" to "Painting." In Sixteen Volumes, \$5 each. New York city: D. Appleton & Co., Broadway.

The thirteenth volume of the revised edition of this work has lately been issued. It opens with an excellent colored map of the Holy Land, which accompanies an article in which due reference is made to the latest explorations and archeological discoveries in that interesting portion of the globe. The article on "Plants" is very full, and is copiously illustrated with excellent engravings and a chart showing the distribution of plant life over the world. Among other notable articles are those on "Paper," "Paris," "St. Paul," "Patagonia," "Persia" (with map), "Phonography" (an excellent exposition of the science), "Phosphorus," "Political Economy" (by that eminent writer, Henry Carey Baird, of Philadelphia), and "Patent Law," the last article being by Hon. E. T. Drone. The volume is fully up to the high standard of its predecessors.

Inventions Patented in England by Americans.

[Compiled from the Commissioners of Patents' Journal.]
From October 19 to October 23, 1875, inclusive.

- AIR COMPRESSING ENGINE, ETC.—E. Cope et al., Hamilton, O.
- ARTIFICIAL FUEL.—T. H. N. McPherson, Washington, D. C.
- ATTACHING BUTTONS, ETC.—D. Heaton, Providence, R. I.
- BALE TIE.—T. H. Murphy, New Orleans, La.
- BUCKLE.—W. T. Reaser, Centralia, Wis.
- CUTTING OUT TABLE.—J. Herts, New York city.
- DIAMOND HOLDER.—J. W. Branch, St. Louis, Mo.
- GRINDING MACHINERY, ETC.—J. W. Blake, Jersey City, N. J.
- LEAD TRAP.—F. N. Du Bois, New York city.
- PRINTING INKING APPARATUS.—A. Campbell, Brooklyn, N. Y.
- RAISING AND DELIVERING GRAIN, ETC.—W. H. Brown, New York city.
- REFRIGERATOR, ETC.—L. C. Cattell, Cleveland, Ohio.
- WATER METER.—D. W. C. Taylor et al., Brooklyn, N. Y.