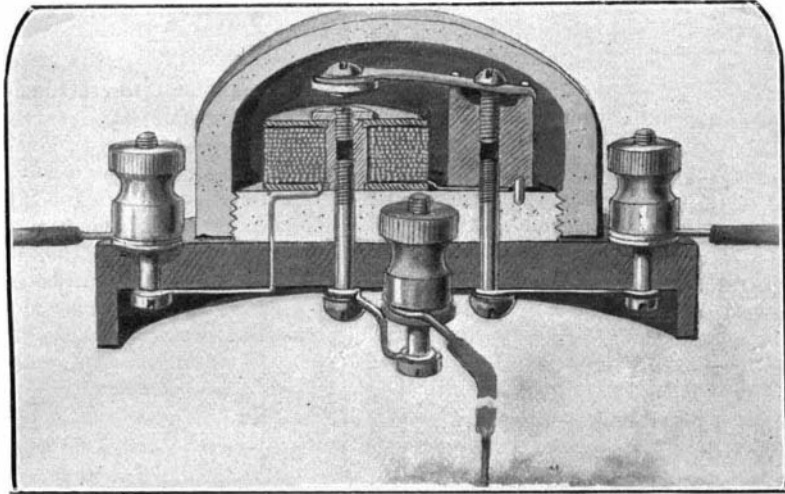




A LIGHTNING ARRESTER OF NEW FORM.

We illustrate herewith a sectional view of a form of lightning arrester recently patented by Mr. Julio E. Cordovez, of Panama, Colombia. It belongs to that



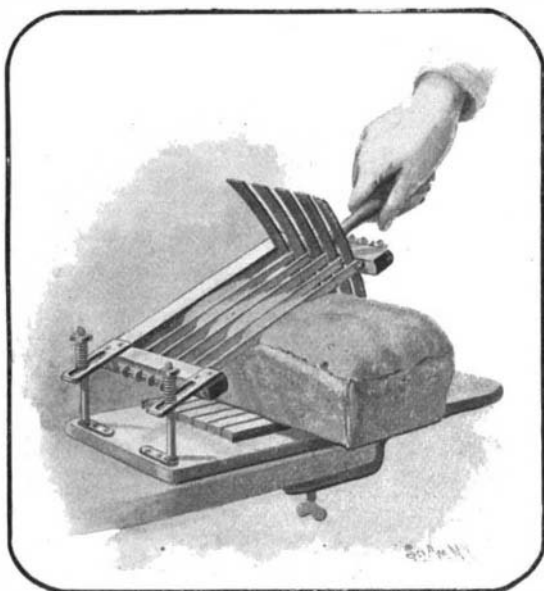
IMPROVED LIGHTNING ARRESTER.

type in which a magnet, when energized by an abnormal flow of current, will attract an armature and produce a ground connection, whereby the flow of lightning or of any undesirable charge of electricity is directed to the earth.

The construction of the device is as follows: Mounted upon a base of hard rubber, or ebonite, is a plate preferably of porcelain. A dome of porcelain covers the device and is screwed down over this base plate. The lightning arrester is introduced into the line by connection to the binding screws at each side. One of these binding screws is connected to the actuating magnet, and from the magnet a wire leads to a metallic post. The line circuit is completed through the screw which holds this post to the base plate and a wire connecting this screw with the binding screw on the right as illustrated. Secured to the top of the metal post is one end of a spring, which supports at its opposite end the armature of the magnet. Side play of this spring is prevented by beads on the post, and the top of the post is also provided with a channel or groove, so that by turning the securing screw the spring is pressed slightly into the channel, thus raising the armature. In this manner the spring can be so adjusted as to hold the armature up against the attraction of the magnet under a normal flow of current. If now a lightning charge strikes either of the line wires, or any atmospheric electrical disturbance causes an increase of potential in the line, the magnet will be sufficiently energized to draw down the armature into engagement with a headless screw in the magnet core. This makes connection through a third binding post to the ground. Further adjustment of the device may be had by turning the headless screw, and securing the same by means of a locking disk as shown.

A NEW SLICER.

A device of simple construction has recently been invented by Mr. G. L. Leachman, of New Cumberland, W. Va., whereby a number of slices of bread or cake may be cut at one operation. This will be found particularly useful in large restaurants, permitting



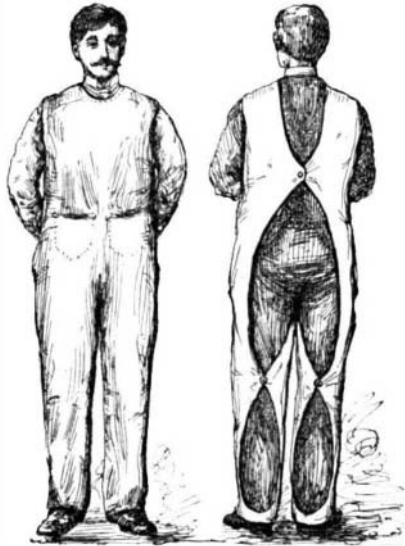
BREAD CUTTER.

large quantities of bread to be quickly and easily cut into slices of a uniform size. The device is provided with a clip on its base by means of which it may be readily clamped to a table-top or the like. The slicing blades are held in the frame mounted to swing vertically over the base. The blades at one end pass through slots in the lower crosspiece of the frame, being held there by a rod passing through their projecting ends. At their opposite ends the blades are fastened to threaded stems, which pass through the upper crosspiece of the frame and are adjusted and firmly secured by thumb nuts. On the rear of the frame are two slotted arms through which two posts extending from the base project. On these posts, and bearing down on the arms, are spiral springs which may be regulated to the proper tension by turning the adjusting nuts. Near the forward end of the base are upwardly extending guide fingers between which the cutting blades pass, and on the base in alignment with the guide fingers are strips which are spaced apart and on which the loaf to be sliced is supported. To hold the bread from movement while slicing, pins are employed which extend upward from certain of the strips and enter the loaf. In operation, after raising the frame with the blades, a loaf is placed in the machine against a stop plate and then the frame is moved downward to cut the slices.

During this movement the slots in the arms of the frame permit a slight longitudinal movement of the blades through the bread, and the springs on the rear posts have a tendency to force the rear ends of the blades downward. The spaces between the strips on the base permit the blades to pass effectually through the loaf.

A NEW PATTERN FOR OVERALLS.

A patent has just been granted to Mr. Eugene A. Holston, of Duluth, Minn., for a new form of overalls which can be quickly applied, allow perfect ease of movement



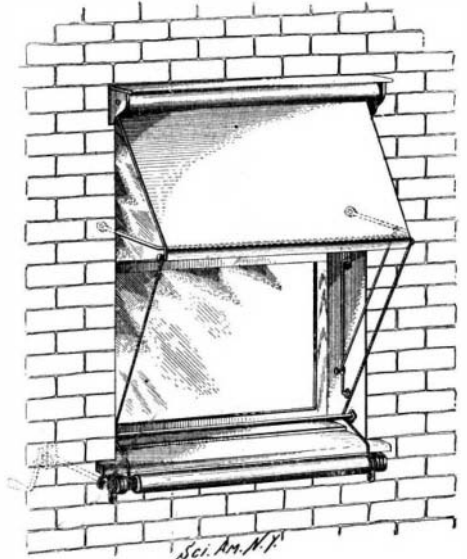
A NEW DESIGN IN OVERALLS.

to the wearer, and prevent crumpling of trousers over which this improved garment is worn. The garment, as illustrated, covers completely the front of the body and legs. It is held in place by portions passing over the shoulders and by flaps attached which extend around the back of the trunk and legs of the wearer. The garment is snug fitting over the trunk, but fits loosely over the legs. Owing to the fact that the rear portions of the knees and hips are not covered, perfect freedom of movement is allowed at these points, and since the garment fits loosely over the lower portions it allows the trousers beneath to hang properly and does not crumple or gather them in bunches. The readiness with which this improved overall can be slipped on over the ordinary trousers and buttoned in place is a feature which should appeal to all workmen.

ODDITIES IN INVENTIONS

CONVERTIBLE WINDOW-SHADE AND AWNING.—A recent patent describes an improved arrangement of window-shades whereby the shade may be easily converted into an awning or be made to serve as a substitute for shutters to the windows. The shade, which is made of any translucent flexible material capable of withstanding the elements, is secured to a spring-roller of ordinary type, journaled under a cover to the upper outside of the window-frame. Operating cords are secured to the lower end of the shade and pass over a projecting awning-frame, thence under a rod at the bottom of the window to the lower winding roll. This

roll may be operated, through the medium of a pair of miter gears and crank, from the interior of the building. By this means the shade may be drawn down as illustrated to serve as an awning. The operating crank, it will be observed, is hinged so that it



CONVERTIBLE WINDOW-SHADE AND AWNING.

may be folded back to engage a catch and thus hold the curtain in position against the tension of the spring roller. By drawing the shade down to its limit the room will be shaded and sheltered from outside observation. At the same time an ample sufficiency of light will pass through the translucent material, and a generous supply of air will be admitted through the openings at each side of the curtain. This arrangement also serves to prevent frost from accumulating on the window-glass at night. It will be observed that the awning-frame may be adjusted to various positions, or may be folded flat against the window-frame.

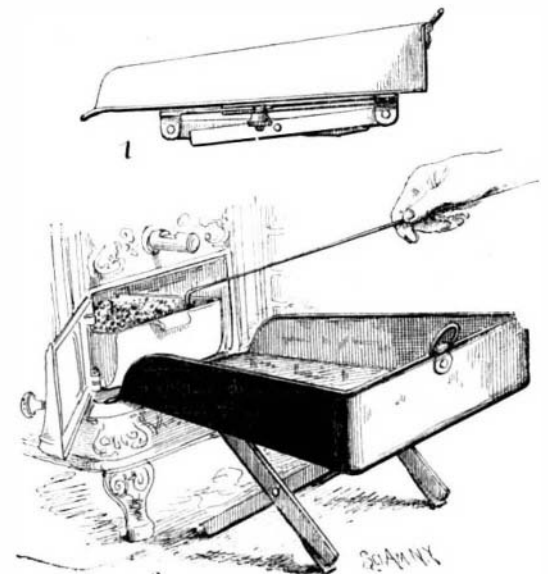
DEVICE FOR WARMING BRIDLE BITS.

In cold weather the bits of bridles hung up in a stable often become so cold as to torture and seriously injure the horses when these cold bits are placed in their mouths. We show here a very simple device for warming the bits. It consists of a cap piece adapted to fit over the top of an ordinary barn lantern. This cap is provided with two curved guards, which serve to engage the bits and prevent them from slipping off. Our illustration shows a bridle hung by its bit to the cap piece and being warmed by the heat of a lantern. Grooves are provided in the top of the cap piece for receiving the bits, and two bridle bits may be warmed at the same time without interfering with each other.



DEVICE FOR WARMING BRIDLE BITS.

SAFETY ASH-PAN.—One of the most irksome duties connected with a range is the removal of ashes. There is always the danger of spilling some of the ashes while endeavoring to lift the inaccessible pan out of the stove, and raising a cloud of dust; nor should we ignore the danger of dropping live coals or sparks on



SAFETY ASH-PAN.

the floor and thereby causing a fire. The operation would be greatly facilitated by the employment of a safety pan, such as that illustrated, into which the stove ash-pan may be drawn to a more accessible position, and then easily removed. This safety pan is provided with folding legs, so that it may be properly supported when in use, and at other times folded as in Fig. 1 to occupy a minimum space. The legs, it will be observed, are pivoted together at their centers and to the pan at their upper ends; but the forward upper pivot is adjustable toward and from the rear upper pivot, being secured to a bar sliding in a guideway. A thumb-nut is provided, which may be screwed up to secure the bar in any desired position. The height of the pan from the floor can thus be regulated to a nicety. The lower ends of the adjustable legs are provided with lugs, to prevent the legs from reaching and passing the center, which would lock them and render it impossible to adjust the legs by means of a slide.

United States Patents in 1902.

The annual report of Mr. F. T. Allen, Commissioner of Patents, for the calendar year ending December 31, 1902, has been forwarded to Congress. It appears that during the twelve months its statements embrace there were 48,320 applications for patents filed in the Patent Office, 1,170 applications for design patents, 151 applications for a reissue of patents, 2,602 applications for registration of trade marks and 1,121 applications for registration of labels. On these applications there were 27,776 patents issued, including designs; 110 patents reissued, 2,006 trade marks registered, 767 labels and 158 prints. The number of patents that expired was 23,331. The number of allowed applications awaiting the payment of the final fees was 9,284. The number that were forfeited by non-payment of fees was 4,471. The total expenditures of the office were \$1,393,345.54. The excess of receipts over expenditures was \$159,513.54, and the total balance to the credit of the Patent Office in the treasury of the United States was \$5,488,984.61.

More patents were issued to citizens of the District of Columbia in proportion to population than any other State or Territory in the United States, the ratio here being 1 to every 1,080 of the population.

The Patent Office issued 27,886 patents during the year 1902, the largest annual issue in its entire history.

The number of mechanical patents issued during the year 1902 is 27,136, exceeding by 1,578 the issue of such patents for the preceding year, which was then the largest number issued by this office in any year.

In the work of handling this business it should be noticed that the class of mechanical patents, which has increased so largely in numbers during the last year, comprises those cases which involve the largest amount of work in their consideration. The increase of work indicated by the figures given has been met in some degree by the increase in the number of examiners which was provided in the appropriation bill for the year 1902-'03.

The work of classification of patents has progressed satisfactorily during the past year, and the results of this valuable system are now available to facilitate the examination of the question of novelty of inventions.

The duties of the assignment division of this office are to record assignments of patents and inventions and to furnish manuscript copies of records of the office when required. During the year 1902, 24,091 deeds were received for record, of which 22,833 were recorded. Copies of records were also made, which included 16,576,150 words. The number of deeds received was 1,102 in excess of the number for the preceding year, and the number of words written in furnishing copies of records was 2,056,110 more than for the preceding year. These figures serve to indicate the rapid growth of this portion of the work of this office.

During the last year Section 4883 of the Revised Statutes was amended by act of Congress, approved April 11, 1902, the change making it no longer necessary that patents should be signed by the Assistant Secretary of the Interior.

Another Patent Dedicated to the Public.

Following the example of Col. J. J. Astor, who, it will be remembered, recently presented his turbine patents to the public in a letter addressed to the Editor of the SCIENTIFIC AMERICAN, Brig.-Gen. William Crozier, Chief of the Bureau of Ordnance of the War Department, dedicates to the public in a letter to the Commissioner of Patents, his invention of certain improvements in wire-wound guns. Gen. Crozier has taken this step in order that inventors who desire still further to improve on the gun may have the opportunity to use his invention as the basis of their work. In his letter he says that:

"A feature of my invention consists in the manner of so locking together the parts of the gun that they cannot separate in a longitudinal direction under the action of the forces to which the gun is subjected, at the same time interrupting in a very slight degree the continuity of the wire envelope."

Brief Notes Concerning Patents.

Mrs. Sarah Wood Clarke, of New York, is the inventor of a device which is said to greatly increase and improve the sound of the piano. There was recently given a demonstration of the improvement at one of the leading hotel ballrooms of New York. The device is a shell-shaped construction placed inside the lid of a grand piano, and when this is opened as usual for a performance the shell acts as an auxiliary sounding board, improving the tone of the instrument and increasing its volume.

A. A. Phipps, who is the inventor of a self-heating branding iron, has just returned to his home in Denver, Col., after a trip through all the principal countries of Europe in the interests of his invention. Although this method of branding was introduced only a short time ago, it is now being widely adopted through the West. The device consists of a copper brand on the end of a steel tube. The latter acts as a reservoir for gasoline, which is turned into gas and burned inside the branding metal, which is thereby kept hot constantly. The self-heating branding iron is now patented in fourteen countries.

A paper improvement is announced from Chicago, by which the strength of the paper is greatly increased. This process was worked out by Dr. John Weisner and Adolph Gehrman, both of the Columbian Laboratory. The latter was until recently the City Chemist connected with the Health Department. The process is not ready to be announced, but Dr. Weisner says they

have gone far enough to say positively that they have discovered a formula by which the strength of all paper can be increased four or five times by the addition of some chemicals while the paper stock is in the course of manipulation.

The manufacture of lightning rods has declined to such an extent that the business has almost been lost sight of. There appears to be no mention of it in the census reports, there being no reports of any output of this character made by any electrical manufactory, and only one firm of electrical engineers announces the design of lightning rods as a part of their business. Lightning strokes are reported to be more rare, especially in the cities where there are such an abundance of electrical wires which serve to protect the surrounding properties.

Miss Ida May Fuller has brought suit for infringement against Messrs. Gilmore & Thompson, of the New York Academy of Music, and Frank McKee, manager of the "Ninety and Nine" Company, which filled a date at that house recently. The alleged infringement consisted of the use of a device by which the flames are realistically imitated by the use of widths of silk, moved by the action of a rotary fan, the illusion being heightened by the colored rays from a limelight. One of the thrilling scenes of this performance is the passage of an engine through the leaping flames, going to the assistance of some fire-stricken pioneers.

Mention has been made here before of the process invented by the artist J. F. Raffaelli, now in Paris, who has devised a means of solidifying colors so that superior effects can be secured without the use of the palette and brush. It is also stated that the new method has the advantage of rapidity. An exhibition of seventy-two works of various character, done by twenty different artists, was held recently at the Durand-Ruel gallery in Paris and attracted a great deal of attention, not only because of the novel method by which they were made but because of the excellence of the results attained.

A hollow axle for railroad cars is being made by the Howard Axle Company, of West Homestead, Pa., which concern is controlled by the Carnegie Company. For the purpose of fully determining the value of this innovation, the axles are being fitted to one of the pressed steel cars of the latest design, which after six months of service will be examined and compared with another car, fitted with the solid axle, which has been in the same service. The axle is made under the Mercader patent and the advantages claimed for it are less weight, lower cost, and greater service. The manufacture of the hollow axle is a much simpler operation than that of the solid axle.

A new steam yacht in New York waters is the "Revolution," which was built at the works of the Charles L. Seabury Company, at Morris Heights, to demonstrate the adaptability of steam turbines to commercial marine purposes. The engines are the design of Charles C. Curtis, and the boat is 178 feet over all, 16½ feet beam and 7 feet draught. While the boat was not built for speed, she has shown herself to be one of the fastest crafts in the waters around New York. The "Arrow" of Charles R. Flint, which has a reputed speed of 39 knots an hour, barely beat her in a three hours' run, and the turbine boat pulled all around the "Monmouth," which is said to be the "Arrow's" second.

RECENTLY PATENTED INVENTIONS.

Electrical Inventions.

VISIBLE-SIGNAL TELEGRAPH.—W. A. FARRELL, Wellsville, N. Y. In this visible-signal telegraph the object of the invention is to form letters of the alphabet and similar characters by simultaneously flashing a plurality of lights arbitrarily selected from different clusters for the purpose of forming the characters of a prearranged alphabet. The main features of the apparatus consist of a switchboard provided with switches for operating an electric current and a series of lights, preferably nine in number, arranged in distinct clusters, each cluster being made up of lights of different color and the several clusters being alike.

ELECTRIC MOTOR OR GENERATOR.—J. A. TITZEL, SR., Franklin, Penn. This electrical device belongs to the class capable of use either as motor or generator, and the inventor has for his object the production of a strong and uniform magnetic field, so that the apparatus will be thoroughly efficient in either of its capacities. This application is a division of another one previously filed by Mr. Titzel.

ELECTRIC CUT-OUT.—C. WAGNER, Brooklyn, N. Y. This invention bears on improvements in electric cut-outs particularly adapted for use in connection with the wiring of electric lamps; and the aim is to furnish a cut-out of simple construction designed for connection with a lamp-supporting tube or standard, through which the wires pass and arranged to have a rotary movement in one direction to cut the current in or out.

Engineering Improvements.

APPARATUS FOR CONTROLLING THE

PASSAGE OF STEAM OR WATER.—E. M. EDEN, No. 76 Adelaide Road, London, England. This contrivance has for its object to provide in connection with a steam-boiler, steam-trap, or other steam-container, valve-operating means whereby to cause a valve controlling the passage or escape of steam or water to be automatically operated for the purpose of regulating directly or indirectly the action of a feed pump or injector, also for permitting the escape of water from a steam-trap, or for allowing the passage of steam to a whistle in the case of a high or low water alarm, the action of the valve-operating device being dependent on difference or equality of pressures established within the device, according as the temperature of the contents differs or not from the temperature of steam at the pressure within the steam-container with which it may be connected, whatever that pressure may be.

Mechanical Devices.

FARRIERY-MACHINE.—S. J. McDONALD, Gallatin, Mo. The primary object of this farriery machine is the provision of means by which either a plain-toed shoe or a clip-toed shoe may be produced in an easy and quick manner. It answers the demand among farriers for a simple, strong, and compact machine which will hold a horse or mule shoe in a position convenient to the workman in finishing up any portion of a horseshoe, either the plain-toed shoe or the shoe having a toe-clip, and also to finish an outwardly standing calk at the toe of the shoe, as well as the heel.

SAFETY APPLIANCE FOR DUMB-WAITERS.—H. DONOHUE, New York, N. Y. The purpose of this invention is to prevent the fall-

ing of a waiter in case of breakage of the hoisting cable. When the weight of the dumb-waiter is thrown upon the free end of the lever, the end is moved upward, thereby compressing a spring. With the lever in this position, whether the waiter is raised or lowered, the spring is usually compressed. If, however, the hoisting-cable breaks, the elasticity of the spring asserts itself, the lever's long or free end is instantly thrown down, and a revoluble roller engages the lever, thereby pressing the shoe into contact with the stationary cable, thus locking the waiter upon the cable.

MACHINE FOR MAKING PIPE-MOLDS.—J. INGHAM, J. POULSON, and J. W. MOORE, Phillipsburg, N. J. The improvements developed by this invention relate to a machine for making pipe-molds of plastic material, such as sand combined with a suitable adhesive substance; and it involves a vertically disposed flask and pattern with a number of stamps arranged to work between them. The particular improvement within the scope of this invention, is the manner of feeding the material and of driving the stamps.

Technological Advances.

CONCENTRATED HOPPED WORT AND PROCESS OF PRODUCING SAME.—H. A. HOBSON, 54 Church Road, Acton, London, England. In this process the inventor secures the production of a hopped wort from which beer, either alcoholic or non-alcoholic, may be made by the mere addition of yeast and water or of water alone, as the case may be. In the ordinary brewing process, at times the bitter of the hop is unfavorably affected, objectionable resinous matters are extracted, and the volatile aroma of the hops to a great ex-

tent lost. In the present invention these defects are avoided.

MULTICOLOR-PRINTING.—E. T. NEBEN, East Orange, N. J. The present invention relates to multicolor-printing by engravings or otherwise. It provides the face of a metallic plate with projections, and forms thereon by a photographic-printing process any design or transfer print or drawing of the object to be treated in color, and stains the print to render it visible, then forms non-printing portions in the plate by cutting out such portions, and also forms graduated and solid printing portions on the plate, by burnishing the portions.

SILVER BROMID GELATIN AND PROCESS OF MAKING SAME.—A. COBENZL, Bingen-on-the-Rhine, Germany. In this process all the difficulties in making a sensitive silver bromid gelatin which does not cloud are avoided, and a product always without failure is obtained in an easily-washable form. The product possesses an even degree of sensitiveness and all desirable qualities. The gelatin is manufactured by subjecting a solution of the emulsion in a hot state to the action of alcohol. It is then permitted to ripen, then to cool by agitation so that the gelatin precipitates as a fine-grained sandy powder, which is finally separated and washed.

PROCESS OF SOLIDIFYING VOLATILE HYDROCARBONS AND ALCOHOL AND PRODUCTS THEREOF.—A. H. CRONMEYER, New York, N. Y. The aim of this invention is to offer new means of solidifying inflammable hydrocarbons in order to obtain a congealed product which when ignited will burn without melting the body of the product and without danger of explosion. The process in question is chiefly applicable to the solidification of