

darker page, and an accurate statement of the birds destroyed in a single year to provide the women of the world with feathers could be made, it would astonish those who affect that the question is one of mere sentiment. Unless something is done many birds, valuable as scavengers, as insect eaters and as objects of beauty, will be wiped out of existence.

Hypo in the Developing Bath.

It has been the general rule that the presence of hypo in the developing bath should be carefully avoided as causing fog or destroying the image; however, certain developers, such as metol, orthol and others, permit the addition of a small proportion of hypo, this giving greater clearness to the negative. This proportion should not exceed a certain limit, the only developer to which hypo may be added in any considerable quantity being pyrocatechine, and with this developer a combined developing and fixing bath may be made. Dr. E. Vogel, now deceased, made a number of experiments in this direction, and was successful in preparing a bath of this kind. He found that, as pyrocatechine is a rapid and powerful developer, an excess of caustic potash is not necessary, but only the proper proportion to carry on the reaction. He recommended the following formula for a combined developing and fixing bath. It is in concentrated form and should be diluted with water for use:

Pyrocatechine, 7 grammes; caustic potash, 7 grammes; sodium sulphite, 30 grammes; water, 75 c. c.

This developer gave excellent results when used as the base of a combined bath. The proportion of hypo varies with different makes of plate, as some of these require a much longer time for fixing than others. The combined bath may be also used for positives and for bromide prints.

The Earthquake at San Jacinto Mountain.

It has been discovered that a part of the San Jacinto Mountain, San Jacinto, Cal., has slipped into a subterranean cavern. The territory covering 600 acres at an elevation of 4,000 feet, was dislodged by the Christmas earthquake and slipped 150 feet lower down than it had previously been, and the face of the new valley is thickly traversed with fissures and cracks. The earthquake has been succeeded by a dozen of light shocks and though they are becoming infrequent, the residents are still much alarmed.

Correspondence.

One More Word Concerning Superposed Turrets.

To the Editor of the SCIENTIFIC AMERICAN: Having carefully read all the articles, concerning superposed turrets, that have come to my notice, I find, as stated in the SCIENTIFIC AMERICAN of April 14, that the opposition to the adoption of this type of turret can be said to be of two classes, structural and military. The structural question having been successfully disposed of, the military still remains, and probably will remain until the actual service for which the ships were designed, on which these turrets are placed, shall have decided the question.

It is my purpose in writing this letter to put forth a point of view which I have not seen taken as yet.

One of the disadvantages claimed for the double-deck turret system is that the 8-inch and 13-inch guns cannot be respectively trained on the lightly and heavily armored portions of a ship at the same time, should it be so desired. This, it seems to me, can be done since the 8-inch guns can be elevated independently of the 13-inch guns. Thus, while the 13-inch are trained on the heavily armored portion of a ship—which will most likely be near the water-line amidships, where the most damage could be done by a successful shot—the 8-inch could be trained upon the vertical side-armor directly over the point of attack of the 13-inch guns, which is also a harvest for shells; for it does not necessarily follow that because the four guns have to be revolved simultaneously they have to be elevated and depressed in unison.

But why train the guns on the differently armored portions of a ship when the most effective results can be obtained by training them on a common mark? What armor can resist the instantaneous impact of four large caliber projectiles? The desire to train the 8-inch guns upon the lightly armored portions of a ship arises from the fact that they are not designed to attack the heaviest armor. But, in the double-decked system, do not the 13-inch shells "pave the way" for the 8-inch shells, provided the proper charge of powder be used? Do not the 8-inch shells reach their mark before it has recovered from the shock of the heavier projectiles, and thus have easier access to the ship? It appears that four shots planted at the same place almost instantaneously would do far more damage to a ship, if not enough to sink her, than if the guns were trained independently.

In your calculations of the apparent number of shots that would have to be fired before a turret would be struck, you have overlooked the fact that the turrets of the "Kearsarge" and "Kentucky" present a great deal larger target than did those of the Spanish ships. Yet, on the other hand, the increased weight which the superposed turret and guns gives to the turret as a whole, greatly increases its power of resisting any projectile that might strike it.

Believing that these points of view might be of interest to your readers, I take pleasure in submitting them.

CARLOS DE ZAFRA.

New York, April 14, 1900.

The Current Supplement.

The current SUPPLEMENT, No. 1269, is filled with interesting matter. "The Famine in India" is the subject of the first article, which is accompanied by engravings showing the terrible condition of these people. "The Cruise of the 'Albatross'" is concluded in this issue. "The Assumed Inconstancy in the Level of Lake Nicaragua; A Question of the Permanency of the Nicaragua Canal" is by C. Willard Hayes, of the United States Geological Survey. "Modern Field Artillery" describes, in great detail, the way in which mountain guns are transported. "The Standardization of Automobile Batteries" is by James K. Pumphrey. "The Roman Forum" is a most interesting article by Richard Norton, and is accompanied by excellent engravings of new finds. "Shipping and Shipbuilding in the United States" is by James W. Ross. "Telepathy and Trance Phenomena" is by James H. Hyslop, Ph.D. "The Training of Dogs" is an illustrated article. "Review of the Traffic Questions in France" is by C. Colson. "New Cellulose Industries" is by A. D. Little.

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RECENTLY PATENTED INVENTIONS.

Agricultural Implements.

ROLLER-HARROW.—CHARLES WEHRENBURG, Mound City, Ill. The rollers of this harrow can be adjusted so that sufficient space can be obtained between them to accommodate a row of corn, or so that two rollers can be brought so closely together that they will act as a single long roller. Cleaners are provided for the harrow-teeth, which can be adjusted to correspond with the rollers or drums. The supporting wheels can be quickly brought into engagement with the ground and caused to act through the medium of attached levers to raise the rollers or drums from the ground. The harrow can be built with or without supporting-wheels.

Bicycle and Automobile Appliances.

BICYCLE-PUMP.—JOHN H. ROBINSON, Washington, D. C. The ordinary hand or foot pump necessitates the use of a flexible tube and lacks both power and efficiency. The inventor has devised a pump which requires no rubber connecting-tube, and which is directly attached to the tire-nipple, so that money, time, and labor are saved. Less force is required to operate the pump, and a greater efficiency is obtained.

ANTI-FRICTION-BEARING FOR WHEELS.—HARLAN P. COLBY, Grand Rapids, Mich. The purpose of the invention is to provide a bearing of simple construction by means of which friction will be reduced to a minimum. The bearing can be readily adjusted when worn. A housing carried on the axle contains a roller engaging the spindle and having tapered necks engaging tapered bearing-rollers. The outer ends of the rollers engage adjustable thrust-rings. Guide-rollers engage the lower portion of the spindle.

Engineering-Improvements.

PUMP-VALVE.—FRANK B. ECULESTON, WILLIAM F. MILLER, and JOHN A. NELSON, Nebraska City, Neb. To the valve-seat a stem is secured having a head. A plate mounted above the seat moves on the stem and has a beveled annular flange. A spring bears between the head of the stem and the plate to throw the plate toward the seat. A housing having an enlarged annularly-recessed lower end, incloses the stem and spring. The lower portion of the housing incloses and is secured to the plate. A valve-ring is held between the beveled flange of the plate and the annularly-recessed lower end of the housing. The valve-ring is thus protected from corrosion, and is easily placed in position.

ROTARY ENGINE.—CARROLL M. BELL and GEORGE E. BLAKE, Greencastle, Ind. The rotary engine has a concentric piston working with shiftable abutments, so that the piston can be driven continuously, the abutments moving in and out of the path of the piston to permit the passage of the piston past the abutments.

VALVE.—JOHN C. WOOD, Raton, New Mexico. The invention is concerned with improvements in valves and means for actuating these valves to control the entrance and exhaust of the motive agent for actuating the piston. The valve is mounted to oscillate on a parallel plane with the face of the piston. A connection between

the valve and the piston extends axially into the valve, whereby the valve is moved as the piston reaches the ends of its strokes.

Mechanical Devices.

TYPE-WRITER.—MANUEL S. CARMONA, Mexico. The machine is of the five-key type previously devised by the same inventor. In the present invention the type is carried by flexible bands which wind on spring-rollers and are moved lengthwise by the keys, the extent of the movement depending on the keys struck. The machine automatically varies the spacing, so that, for example, the feed will be greater for capitals than for small letters. The type-writer differs from that previously patented by the inventor, chiefly in details of construction.

WEIGHING AND BAGGING MACHINE.—ALONZO C. BOSWORTH, Putnam, Conn. This machine is especially adapted for weighing and bagging grain. The machine can be used in connection with any platform scale, and so adjusted as to shut off the supply of grain as soon as a certain weight of material is obtained and indicated by the scale-beam properly balanced. A grain-receiving hopper is mounted on the scale-beam and provided with means for holding the bag. The support for the bottom of the bag is capable of adjustment to hold bags of different lengths.

LATHE-ATTACHMENT.—HARRY T. SHEARER, Scotland, Penn. The purpose of this invention is to provide means whereby the carriage on an engine-lathe can be independently adjusted of the driving mechanism, thus permitting the tool to be accurately engaged with the work at all periods during the operation of the lathe. Should it become necessary in cutting a screw, for example, to remove the tool temporarily from the lathe, the tool, when replaced, can be easily adjusted to the work without the usual inconveniences.

BORING IMPLEMENT.—WILLIAM T. MAXWELL and GEORGE J. SPAHN, 943 W. Lombard Street, Baltimore, Md. The implement is used for boring through joists or in corners, or at angles where the ordinary brace or bit cannot be used. The implement comprises a threaded shaft with a back bearing, having a flaring front end, and a tapered nut made in halves. A disk is provided, having slots and screws passing therethrough and entering the respective halves of the nut. The disk serves to hold the parts of the nut connected, so that one half is exactly opposite the other. The tool is particularly useful in boring through joists in electric light work.

Miscellaneous Inventions.

VEHICLE RUB-IRON.—ELISHA W. PALMER, Fullerton, Cal. The rub-iron is composed of a roller which can be made very short and from which the wheel cannot slip rearwardly. The iron effectually prevents the front wheels from wearing away the body or the running gear of the wagon, or from unduly wearing itself away when the wheels are cramped. The device likewise serves to prevent the front wheels' catching under the body of the vehicle.

HOT-AIR REGISTER.—EDWARD J. MALLEN, Manhattan, New York city. The slats of sheet-metal are arranged to overlap, so as to produce a smoke-light con-

nection. The frame is also made of metal, the braces for the frame constituting means for the attachment of a cover. The trunnions of the slats are integral with the body of the slats; and the bearings of the shifting devices for the slats are also integral with the slats. The several parts of the sheet-metal body are so braced that it will have practically the rigidity of a cast-metal body.

FILE.—CHARLES V. HENKEL and EDWARD M. ANDERSON, Manhattan, New York city. This file is in the form of a temporary binder for holding letters and the like. It embodies clamping-sections provided with prongs for piercing the letters and actuated by springs, so that when the restraining-catch is released, the clamping-sections will ordinarily open, the restraining-clamp serving to hold the clamping-sections against the springs in locked position. The clamping-sections are mounted to move in precisely the same time, so as to throw the prongs in and out in like manner.

COAL-SCREEN.—CHARLES GESKE and CHRISTIAN MILLER, Seattle, Wash. The bars of this screen can be easily adjusted to regulate the size of the mesh. The bars are so constructed that, when in position, they will cause the coal or other material to be effectually screened.

SPEED-CONTROLLER AND TIME-INDICATOR FOR SELF-PLAYING PIANOS OR ORGANS.—CHARLES H. FREYER, Marietta, Ga. The invention provides an improved speed-controller and time-indicator for self-playing pianos and organs, which is arranged to enable the performer to control the speed of the instrument accurately according to the correct time stated on the notation of the music to be played.

PROTRACTOR.—JOHN E. EVANS, Wilkes-Barre, Penn. This protractor is to be used for plotting charts, maps, and the like. By its means any number of degrees and minutes at either side of a meridian or other starting line can be marked off without mental calculation. The protractor is of sufficient weight to retain its position on the work, and therefore does not require clamps or extra weights, such as are usually found necessary.

PROCESS OF MAKING STRONTIA.—SPENCER B. NEWBERRY, Sandusky, Ohio. Strontium sulfate mixed with other materials can be decomposed by heat; but the process is slow and uncertain, owing to the fusibility of the sulfate at high temperatures. The inventor has found that the decomposition is greatly facilitated and the fusion prevented by adding to the sulfate a quantity of difficultly-fusible basic material, such as magnesia, lime, carbonate of magnesia, or carbonate of lime.

CUSHION DEVICE FOR DOORS.—WILLIAM F. DAVIS, Lake Charles, La. The invention provides a pneumatic cushion for the doors of ice-boxes or other structures, which cushion is automatically inflated through the act of opening the door. The air supply being cut off from the cushion while the door is closed. Should the cushion be overcharged, the surplus air automatically escapes. If it be so desired, the cushion can be inflated by means of a pump.

ADJUSTABLE CUTTING-STICK.—JOSEPH M. COZZI, Manhattan, New York city. Cutting-sticks are

used in cutting stock for the manufacture of neckties or similar goods in which the edges are parallel. The stock is cut in different widths; and at present it is necessary to have a cutting-stick for each width. To overcome this objection, the inventor has devised a stick which can be quickly and readily adjusted to any desired width, thus making one stick answer for all purposes for which several sticks are now employed.

NUT-LOCK.—ZACHAREAH W. WELCH and EUGENE H. BLACKSHEAR, McComb, Miss. The bolt has an end recess; and the nut is formed with a number of diametrically-opposite grooves extending from its central opening over one face and in its sides. A spring-yoke has a cross-bar and side-bars fitting accurately in the recess, registering face grooves, and side grooves. There are no projecting parts; for the spring-yoke, when in place, is exactly flush with the outer face and sides of the nut. The number of grooves provided renders the nut easy of adjustment.

ARTIFICIAL DENTURE.—DR. ARTHUR T. GLEW, Germantown, Ohio. When only the lower, anterior, natural teeth, are standing, and the gums preclude the insertion of a partial lower denture, all the mastication is done on the anterior teeth; and it is only in exceptional cases that the suction of the upper plate is sufficient to overcome the leverage of the lower on the upper incisors. Dr. Glew has not only overcome this difficulty, but even added to the security of the upper plate by providing such teeth with a rear projection or ledge against which the lower incisors bite, and thus apply a leverage tending to force the upper plate rearward and upward, so that the suction is increased rather than diminished, and the plate held more firmly in place. The attachment of the upper incisors to the plate proper is, moreover, not weakened, as in the ordinary construction.

Designs.

FRUIT-PICKER.—MARQUIS D. L. HARTLEY, Dehesa, Cal. The fruit-picker comprises a shield or guard which is slipped over the thumb, and which is provided on its under surface with a cutting blade whereby the fruit-stem is severed.

TWINE-HOLDER.—JOHN A. THOMSON, Seattle, Wash. The twine is contained in a casing in the form of a truncated cone. The twine is first passed upwardly through an eye in a cross-bar, then through the guides formed by various corrugations below the cross-bar, and finally through a corner-eye in the cross-bar.

UPPER INCISOR TEETH.—DR. ARTHUR T. GLEW, Germantown, Ohio. This design relates to a new form of upper incisor teeth, essentially such as form part of the improved denture for which Dr. Glew has obtained a mechanical patent of same date, referred to in a foregoing notice. The teeth have a straight transverse groove of uniform depth extending across their lower edges, practically parallel to their front and rear sides. The projection forming the rear side of the groove is shorter than the front one, so that it is not visible from the front.

NOTE.—Copies of any of these patents will be furnished by Munn & Co. for ten cents each. Please state the name of the patentee, title of the invention, and date of this paper.