A new Cotton Press has been invented by Mr. Sampson Pope, of Williamsburg, Miss., in which the follower receives greater speed when the power required is light, but is moved slower when the resistance increases and a greater power is needed.

Mr. Lafayette A. Hays, of Greenville, N. H., has patented a new Saw Filing Machine, which consists of an adjustable saw clamp, file holder, and file guide for holding the saw blades and uniformly filing the teeth of the same at any angle desired, horizontal or vertical.

A new Steamer for Feed has been patented by Messrs. F. E. Mills and C. Clager, of Ann Arbor, Mich., which may be used also for laundry purposes, and which is so constructed as to be easily portable.

In an improved Valve Gear for Steam Engines, patented by Mr. Charles A. Smith, of Columbus, Ohio, there is a new construction of the link and of an angle bar employed in connection therewith, in lieu of a link block, the whole forming a simple and accurately working reversing mechanism.

A new Wrench has been patented by Mr. John S. Birch, of Orange, N. J., which will adjust itself to various sized objects and may be securely locked in position.

The new feature in an improved Earth Auger, devised by Mr. B. F. Mull, of Merced, Cal., is the bit, made V-shaped, having a screw point formed upon its angle, and having the forward edges of its arms or wings made sharp and extended beyond the circumference of the tube to which the shanks of said bit are attached.

A new Car Coupling, patented by Mr. Geo. E. Weber, of Opelika, Ala., is arranged to couple cars of different heights on any curve, without the brakeman going between the cars, and is also so constructed as to connect cars having the common pin and link coupling.

Mr. Lewis T. Cornell, of Chicago, Ill., has devised an ingenious implement for extracting, uncapping, loading, cutting, creasing, and closing breech-loading cartridge shells. It embodies many new and useful contrivances, and will doubtless be found valuable by sportsmen.

Mr. Edward Henderson, of New York city, has invented a Clamp, to be used by gold leaf manufacturers for holding the mould while the leaves are removed to be cut into sizes and placed in books.

Mr. William Davies, of Henderson, Ky., has improved the construction of the Tobacco Stripping and Drying Machine which he patented August 14, 1877, so that the leaves are stripped from the stems and flattened and dried in a very effective and ingenious manner.

Mr. William G. Raoul, of Macon, Ga., has patented a device for adapting air brakes, as now used under the several existing patents, to mixed trains, or to render it possible for freight or other cars not supplied with air-brake attachments to intervene between the engine and such cars as may be supplied with air brakes, without rendering the latter inoperative.

Mr. Lorenzo D. Hurd, of Wellsville, N. Y., has patented a new Car Truck, the object of which is to reduce friction in passing around a curve. There is no slipping of the wheels on either side, as they are fixed on independent axles.

Messrs. Robert L. Vernon and George W. Vernon, of Greensboro, N. C., have patented a new Railway Switch Signal, in which a rotating lantern is employed to give different colored lights and thereby indicate whether the switch is open or closed. The red or "danger" signal is given by causing red glasses to appear in front of the lantern lamp whenever the switch rails are not properly adjusted and the switch lever is not locked to the switch stand.

Joseph Saunders, of Brooklyn, New York, has invented a Steam Valve, which is applicable to steam pipes of all kinds, and by which the water of condensation may be collected and discharged, and thereby steam of greater dryness furnished than customary with the common steam valve. The steam valve has an enlarged portion or pocket below the valve seat, a discharge opening in the pocket, and a discharge valve or cock below the pocket for letting out the water of condensation collected in the pocket of the main valve.

A patent has been issued to Alexander Marengo, Joseph Marengo, and R. Marengo, of Montreal, Quebec, Canada, for a Cheroot Machine, which is an improvement on the cigarette machine for which letters patent have been granted them heretofore, dated May 23, 1876, and numbered 177,732, so that the class of cigars known as "cheroots" or "dovetails" may be manufactured thereon with convenience and rapidity. The machine has two top rollers, and an endless belt, which is stretched over the top rollers and over a vertically adjustable bottom roller, whose supporting frame is secured on the fixed side standards of the machine by set screws. One of the top rollers is supported in fixed arms, while the other roller is mounted on pivoted arms, which are connected with a suitable treadle mechanism, so that by pressing the treadle down the rollers will be brought closer to each other and inclose the tobacco placed in the bight formed by the belt between the rollers.

Joseph Koenig, of Indianapolis, Ind., has patented an Awning which may be adjusted into different positions, so as to shut out the sun or light, either partly or entirely It is also readily arranged so as to be closed at either side, and admit a draught of air at the opposite side. The awning may be used as an exterior curtain and rolled up entirely, so as to be out of the way, being protected by the guard piece at the top of the window casing.

A machine for Pasting Together and Drying Rolls or Continuous Sheets of Paper and other Fabrics, patented by Joseph Caller, of Cambridge, Mass., consists of an arrangement of pasting rolls, a sizing roll, and drying cylinders, for simultaneously drying both sides of the paper.

Sern P. Watt, of Jamestown Neb., has patented an improved Velocipede of that class known as four-wheeled or carriage velocipedes, and which are operated by lever action, worked by hand, and guided by means of the feet. The invention consists of a front axle, with stirrups for the feet in connection with a compound lever connection with the double crank of the rear axle. The hubs of the hind wheels have inner boxes, with ratchets that engage spring pawls of the rear axle, to produce the revolving of the rear driving wheels.

Mr. John Hill, of Columbus, Ga., has patented a Copying Press, which furnishes a convenient means for securing privacy for letter copying books against meddlers, as well as security for the same against loss by abstraction. It consists in combining a locking device with the letter press which locking device holds the platen or movable follower to its tightened adjustment upon the book, so that the latter cannot be removed except by the proper person having possession of the key.

Mr. Daniel L. Holden, of Philadelphia, Pa., has devised an improved form of refrigerator for cooling a non-congealable liquid by the evaporation of a volatile fluid; an improved form of condenser for again liquefying the volatilized gas; and an improved form of congealer for freezing cans of water immersed in a tank of refrigerated non-congealable liquid; the said features being improvements upon an ice machine previously patented by Mr. Holden, and illustrated on the first page of this paper in the issue of March 16, 1878. The improvements are protected by three patents.

A new Locomotive Smoke Stack, patented by Mr. Isaac H. Congdon, of Omaha, Neb., is so constructed as not to choke the draught, to arrest sparks, and so that it may be applied to any smoke box.

Communications.

THE ELECTRICAL INDICATOR FOR SHOWING THE ROTATION OF THE EARTH.—A NOTE FROM PROF. MAYER.

To the Editor of the Scientific American:

The reading of the article by Mr. George M. Hopkins on the "Electrical Indicator for Showing the Rotation of the Earth" has suggested an addition to the apparatus which will render the experiments with it more delicate, and make manifest the rotation of the earth after the gyroscope has run for only a minute. If he will attach a plain or concave mirror to the frame of the gyroscope and reflect a beam of light from the mirror to a screen he will have an index which may be of considerable length, of no weight, and have no momentum. If the distance of the screen from the mirror is, say, ten feet, then the spaces over which the light passes on the screen will be the same as those which would be passed over by a rod 20 feet long attached to the gyroscope as an index. This is because the angle of deflection of the reflected beam is always double of that of the angular deflection of the mirror.

The apparent angular motion per hour of Foucault's pendulum and of his gyroscope for showing the earth's rotation is equal to 15° multiplied by the sine of the latitude of the place where the pendulum or gyroscope is mounted. Calling the latitude of New York 40° 43′, we have 9° 47′ as the amount of hourly motion in azimuth. But as the reflected beam moves through double the angle of the mirror attached to the gyroscope, we have 19° 34′ as the hourly angular motion of the reflected beam of light. In one minute of time the beam will move through $\frac{1}{60}$ of 19° 34′, or through 19½ minutes of arc. This angular displacement of the beam will equal ·678 of an inch on a screen ten feet distant from the mirror. In ten minutes of time we will consequently see the spot of light on the screen move through $6\frac{78}{100}$ inches. This quantity, however, gives the motion during the first ten minutes, if we suppose the beam to have started for a direction at right angles to the screen. The distance through which the spot of light travels will be greater during succeeding 10 minutes of time, for the distances will be the tangents of the angular deflections. If, however, the screen have a cylindrical surface with a radius equal to the distance of the axis of rotation of the gyroscope to the screen, then the spot of light will travel over equal distances in equal successive portions of time.

For accurate measurements of the motion of the gyroscope it will be better to place a horizontal scale of equal parts facing the mirror at the distance of, say, five to ten feet, and view the reflection of this scale from the mirror by sighting through a telescope with cross threads in its focus. With such an arrangement (see Article XI. of the "Minute Measurements of Modern Science," in the SCIENTIFIC AMERICAN SUPPLEMENT, by the writer) two or three minutes' observation on the motion of the scale over the cross threads of the telescope will suffice to give the amount of angular motion, which may be compared with that which theory requires, and which is computed by any one who has a table of natural sines. He will find the sine corresponding to the angle of the latitude of the place, and multiply this by 15° (the hourly angular motion at the poles of the earth); he will then take $\frac{1}{60}$ of the product for the angular motion in one minute, and double this result to allow for the doubling of the angle of reflection.

Foucault suspended his gyroscope by a strand of untwisted silk fibers, and if Mr. Hopkins will adopt this mode of suspension in place of the steel point, he will get rid of the friction, which should be avoided. There is a good description of Foucault's gyroscope, with four engravings, in Arago's "Astronomie Populaire," volume 3, page 50, *et seq.*

I have during the past winter repeated the Foucault experiment with the pendulum, and the apparent hourly angular motion of the instrument corresponded quite well with the theoretic value. The bob of my pendulum was a thirty pound cannon ball, which I floated in a hemispherical bowl containing mercury, and thus found out the position the ball has when its center of gravity is in a vertical line with its center of figure. The ball was suspended in the same position it had when it floated in the mercury.

ALFRED M. MAYER.

South Orange, N. J., July 1, 1878.

Electrical Indicator for Showing the Rotation of the Earth.

To the Editor of the Scientific American:

In my article on an "Electrical Indicator for Showing the Rotation of the Earth," in your issue of July 6, I mention that the apparent motion of the index is 15° per hour. With this instrument this would be true only at the poles, at the equator it would be 0°, and in this latitude it would be about 9°.

I intend soon to furnish you with sketches of another form of instrument, which will indicate the full diurnal motion when placed at any point on the earth's surface.

GEO. M. HOPKINS.

To the Editor of the Scientific American:

I translate the following from Aristotle, De Mirabiliis, Ausc., page 189, tom. 16, Lipsiæ. Might it not have been gallium of which he wrote?

"They say that Celtic tin is melted quicker than lead. A sign is that it appears to be melted in water. It stains (or sticks to the vessel) quickly. But it is melted away or is liquid in the cold, when it should be congealed."

In the same vol., cap. 36, *Quæst. Mechan.*, you will find the reasons why bodies on eddies of water move to the center, that are the same in part given by some writer lately, perhaps in your journal. J. F. G. MITTAG.

Counterfeiting American Goods.

In reply to the charge that American goods sent to South American markets are not equal to the samples exhibited by agents, a correspondent of the *Evening Post* calls attention to the fact that enormous quantities of cheap imitations of American goods are made in England and Germany to be shipped to the West Indies and South America; and not only is the general appearance of American goods imitated, but the brands, labels, and trademarks of American manufacturers are placed upon the spurious products. In the single district of Elberfeld, in Rhenish Prussia, over thirty factories were at one time at work forging "American" implements, such as axes, machetes, hatchets, and the like, with exact imitations of the private marks of reputable American firms. Law suits against some of the worst of these offenders have resulted in their conviction, but the petty fines imposed by the German courts have had little effect to stop the outrage. The trade is kept up, and American manufacturers find everywhere in the West Indies and Spanish America miserable imitations of their goods, bearing their own names, brands, and trademarks.

The Steam Street Railways of New York City.

It is surmised that the purpose of the constructors of the Metropolitan Elevated Railway is partially moral and pious, at least for the present. Rendering everybody indignant and extremely uncomfortable along the line and in the vicinity of the road by running trains of the noisest and most damaging sort during week days, and intermitting them on Sundays, they hope, it is rumored, to make the Sabbath what the word implies. In this they succeed; they have made Sunday a day of rest and real enjoyment—a day of gratitude and benefaction. The most secular of the West Siders speak of it as blessed and blessing, and admit that never, until the running of the Metropolitan trains, have they fully appreciated it. They are thankful from the bottom of their hearts for Sunday, and wish most sincerely, so far as the railway is concerned, that Sunday might be perpetual. They attend church less than they have done, staying at home to enjoy comparative quiet, and to realize wholly their deliverance from the infernal trains. Many of them are compelled to employ the day in sleep, as they cannot sleep with any satisfaction during the week. We like to have the railway people credited with good intentions, but we fear that they suspend the trains on Sunday for the nonce, only to prevent the indignant howl which they know would rise from the orthodox on account of the necessary interruption of service in all the churches within any ordinary distance of Sixth avenue. A common prayer nowadays on the West Side is, "Good Lord, deliver us from the din and torture of the elevated railway."—*N. Y. Times.*

THE London *Telegraphic Journal*, in a recent article upon the admitted pre-eminence of telegraphic improvements and advances in the United States over all other nations, expresses the opinion that this superiority of the Americans is due to the excellence of our patent laws, which encourage inventors to obtain patents, and place no restrictions upon them after they are obtained.

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