UNITED STATES PATENT OFFICE.

JOSEPH SACCO, OF PARIS, FRANCE, ASSIGNOR TO ISAAC JOEL, OF LONDON, ENGLAND.

APPARATUS FOR AUTOMATICALLY PHOTOGRAPHING, DEVELOPING, AND DELIVERING THE FINISHED PICTURES.

SPECIFICATION forming part of Letters Patent No. 432,903, dated July 22, 1890.

Application filed November 8, 1889. Serial No. 329,630. (No model.) Patented in France July 16, 1889, No. 199,608.

To all whom it may concern:

Be it known that I, JOSEPH SACCO, a subject of the King of Italy, residing at Paris, France, have invented a new and useful Improved Coin-Freed Apparatus for Automatically Photographing Persons and Objects and for Developing and Delivering said Photographs, (for which I have obtained patent in France, No. 199,608, dated July 16, 1889,) of which the following is a specification.

This invention relates to an improved coin-freed apparatus for automatically photographing persons and objects and for developing and delivering said photographs. By preference I use the ferrotype process.

The apparatus consists of a circular chamber or reservoir divided radially into any desired number of compartments containing the various chemicals or solutions suitable for developing and fixing the photographs and water for washing the same. The inner rim of this developing-reservoir is formed as a cam path, track, or surface, upon which travels a roller carried by a frame, in which is pivoted a tray or cage into which the plates fall after receiving the image, ready to be developed. A revolving motion is given to a spindle carrying the cage by means of any suitable clock-movement. The cam-surface upon the developing-reservoir gives to the cage a rising-and-falling motion, so that the plate therein is alternately dipped and withdrawn from each of the compartments as the cage rotates. One revolution is sufficient to complete the cycle of operations. Upon inserting a coin into the apparatus it falls upon and depresses a weighted pivoted lever, which, in its normal position, engages with a pin carried by one of the wheels of the clock-train, so preventing any motion; but so soon as the lever is depressed by the weight of the coin the mechanism is free to work and the cage or tray commences to rotate around the cam-track. As it rotates a cam upon it comes into contact with a disk covering the lens-aperture and causes it to be removed, thereby exposing the plate and permitting of the photograph being taken. The length of time that the plate is exposed is made to depend upon the shape and size of the cam. On the further rotation of the cage another cam upon it causes the plate bearing the image to fall from its position behind the lens into said cage, and as the cage continues to revolve around the developing-reservoir the photographic image on the plate is developed by being successively dipped into each of the various compartments. Just before the cage completes its rotation it is caused to be tilted by the cam on the developing-reservoir, and the completed photograph falls into a chute and is delivered. The undeveloped plates are contained in a column (which forms a dark chamber) one above the other, and they are caused to fall into position behind the lens by means of a pusher coming behind the lowermost one and pushing it forward into a guide, which leads it into correct position to receive the image. The pusher receives a to-and-fro motion by means of a pin carried by the wheel above referred to and working in a slot in the plate, so giving a to-and-fro motion to such pusher.

As will be seen from the above, this apparatus is perfectly automatic in its action, there being no handle or handles to operate in order to assist the mechanism in any way, as in certain other arrangements heretofore constructed.

In order that the invention may be readily understood, I proceed to describe the same with reference to the accompanying drawings.

Figure 1 is a side elevation, Fig. 2 a rear elevation, and Fig. 3 a front elevation, of the apparatus, the casing being removed for the sake of clearness. Fig. 4 is a longitudinal vertical section; Fig. 5, a horizontal cross-section on the line A B of Fig. 1, and Fig. 6 a horizontal cross-section on the line C D of same figure. Fig. 7 is an elevation showing that portion of the apparatus which effects the uncovering of the lens. Fig. 8 is a longitudinal section showing that portion of the apparatus which effects the release of the plate after receiving the image and delivers it into the rotating cage, and Fig. 9 is a face view of the same. Fig. 10 is a detached view in plan of the cage, showing the double cam carried by it. Fig. 11 shows the position the

(No Model.) 2 Sheets—Sheet 2.

W. R. WILL.

TIME AND DATE CALCULATOR.

No. 432,919. Patented July 22, 1890.

Fig. 2.

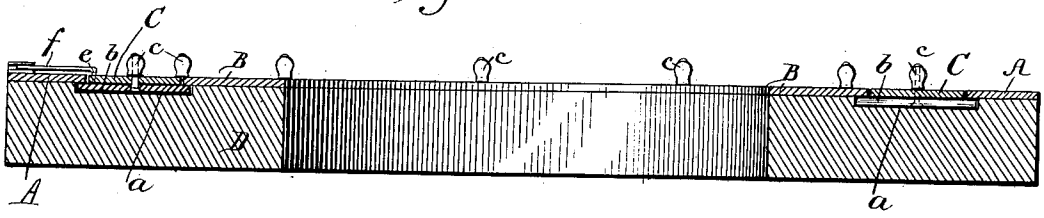
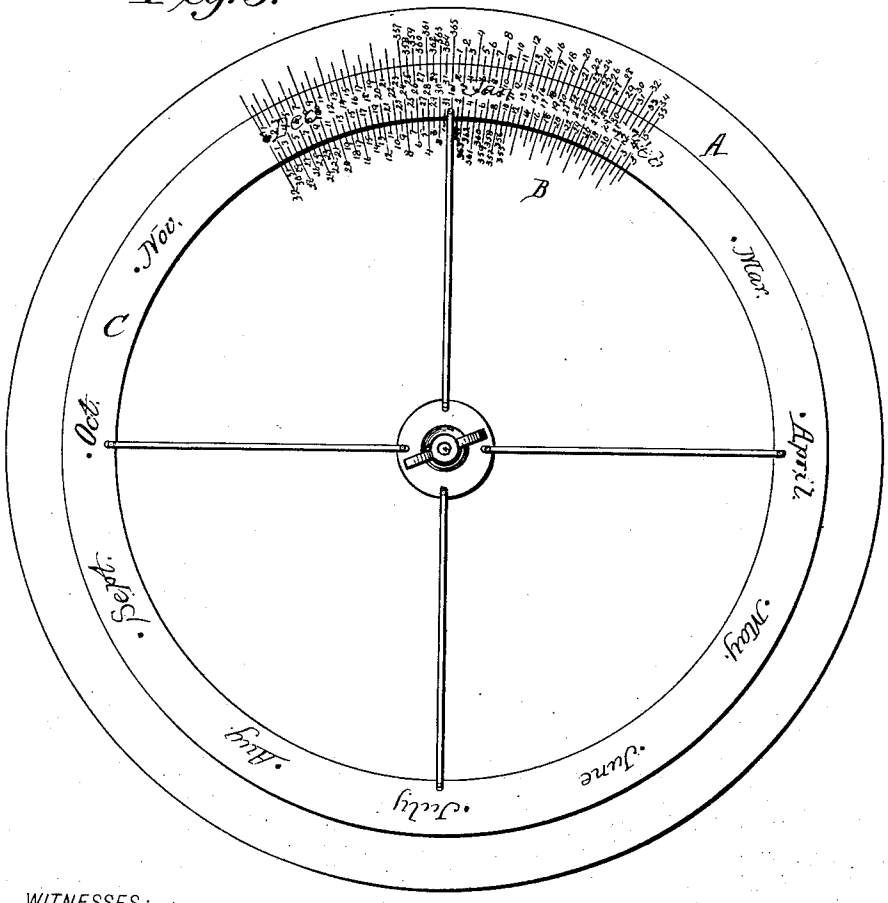


Fig. 3.



WITNESSES:
Fred J. Dieterich
Edw. W. Byrn.

INVENTOR:
Wm. R. Will.
BY Munn & Co
ATTORNEYS

UNITED STATES PATENT OFFICE.

WILLIAM R. WILL, OF BALTIMORE, MARYLAND, ASSIGNOR OF ONE-HALF TO WARREN H. SADLER, OF SAME PLACE.

TIME AND DATE CALCULATOR.

SPECIFICATION forming part of Letters Patent No. 432,919, dated July 22, 1890.

Application filed May 2, 1890. Serial No. 350,396. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. WILL, of Baltimore city, in the State of Maryland, have invented a new and useful Improvement in Time and Date Calculators, of which the following is a specification.

The object of my invention is to provide for the use of banks and counting-houses a device for calculating mechanically the exact number of days between any two dates the interval between which is one year or less, and also the date at which any number of days less than three hundred and sixty-five will fall, if counted forward or backward from a certain given date, the same being intended for calculating interests, determining the maturity of notes, the averaging of accounts, &c.

It consists in the peculiar construction and arrangement of devices, which I will now proceed to describe with reference to the drawings, in which—

Figure 1 is a plan view of the device; Fig. 2, a cross-section of the same; and Fig. 3 is a plan view, on a smaller scale, of a modification.

A B are two fixed circular and concentric graduated scales with a space of one inch and a fourth, more or less, between them, said graduated scales having their opposing circumference divided into three hundred and sixty-five equal parts, corresponding to the number of days in a common year, the divisional marks of the outer scale being consecutively numbered in progression from left to right, commencing with 1 and ending with 365, and the divisional marks of the inner scale consecutively numbered in progression from right to left, commencing with 1 and ending with 365, the divisional mark numbered 365 on the outer scale being placed directly opposite the divisional mark numbered 365 on the inner scale, said three hundred and sixty-five marks being taken as the initial points for both the inner and outer scales in computing days.

C is a movable circular band or ring about one inch and a fourth, more or less, in width, designed to revolve in the space between the two fixed circular graduated scales A and B. Both the inner and the outer circumferences of this revolving circular band have graduated scales, each scale divided into three hundred and sixty-five equal parts and each divisional mark consecutively dated from left to right, commencing with January the 1st and ending with December the 31st, similar dates being situated directly opposite each other. The fixed graduated scales A B are of metal and are fastened to a circular frame D, of wood, hard rubber, celluloid, vulcanized fiber, or other suitable material. This frame has a depression or bed *a* in the space between the inner and outer fixed scales, said depression or bed extending about one-fourth of an inch under each fixed scale throughout the entire circumference of each scale. The bottom and sides of this depression or bed may be covered with a metal lining.

The revolving circular scale C, which is of metal, has fastened upon its under side twelve metallic cross-pieces *b*, which extend about one-fourth of an inch beyond its inner and outer circumference. These cross-pieces are attached to the under side of the revolving band directly under the twelve divisional marks, which show the first day of each of the twelve calendar months of the scale, the fastening of the cross-pieces to the revolving band being effected by rivets, the heads of which are knobbed at *c* on the upper side of the circular band to afford a convenient hand-hold for turning the band when in use and to enable the operator to observe quickly the beginning and the ending of each month of the scale.

The graduated band C is designed to revolve in the depression or bed between the graduated scale A B, the cross-pieces on the under side of the revolving band extending partially under the inner and outer scales to keep the revolving band from falling out of its bed. Instead of using these cross-pieces *b*, however, the edges of the scales A B may be dovetailed or undercut and the ring C adapted thereto, so as to secure the same result without the necessity of grooving or forming a bed in the frame. Each divisional mark of the outer circumference of the revolving band has a small perforation *d*, intended to receive a metallic point *e*, projecting from the under side of a spring-catch *f*,

fastened to scale A, so that when the revolving band is adjusted and the spring-catch is applied scales A B C will be fastened immovably together, the upper surface of the revolving scale lying flush with the upper surface of the fixed scales, the edges of the revolving scale in easy contact with the edges of the fixed scales, and when any one of the three hundred and sixty-five divisional marks of the inner or outer circumference of the revolving band is adjusted exactly opposite any one of the three hundred and sixty-five divisional marks of the inner or outer fixed scales every other divisional mark of the revolving scale will also be situated exactly opposite a divisional mark of the inner or outer fixed scale.

The operation of the device is as follows: If it be required to find the exact number of days between May 29, 1889, and November 18, 1889, seize one of the knobs on the surface of the revolving scale, turn the scale upon its bed until the divisional mark dated May 29, the earlier date, is placed directly opposite the 365 mark of the fixed scale, apply the spring-catch to keep the revolving scale immovable in its bed, then look for the divisional mark on the revolving scale dated November 18, and the divisional mark directly opposite on the outer fixed scale will be found numbered 173, denoting 173 as the required number of days; or place the divisional mark of November 18, the later date, directly opposite the 365 mark of the fixed scale, apply the spring-catch, then look for May 29 on the revolving scale, and the divisional mark directly opposite on the inner fixed scale will also be found numbered 173. To count a given number of days forward from a given date, adjust the given date on the revolving scale to the 365 mark of the fixed scale, apply the spring-catch, find the given number of days on the outer fixed scale, and the opposite divisional mark of the revolving scale will denote the required date. To count a given number of days backward from the adjusted date, find the given number of days on the inner fixed scale, and the opposite divisional mark of the revolving scale will denote the required date. All of the preceding operations are for common years. In leap-years a correction of one day should be made if the given or required interval includes February 29.

The inner and outer fixed scales are intended for the following different purposes: The numbers upon the outer fixed scale are for convenience in finding the time in ordinary calculations of interest, or for averaging accounts when the date of the earliest item of the account or any date anterior thereto is taken as the "focal" date. In the latter case, when the focal date is once adjusted to the 365 mark of the fixed scale, the number of days between that focal date and the subsequent date of each and every item of the account can be discovered without further adjustment by finding the date of each item on the revolving scale, and the number of the opposite divisional mark on the outer fixed scale will denote the days in the interval between the focal date and the date of each item. The numbers upon the inner fixed scale are for convenience in finding the "cash balance" of an account at a particular date, or the balance due at a particular date upon an interest-bearing note by the merchant's rule when one or more partial payments have been made thereon, or in adjusting partners' accounts when interest is allowed on investments and charged on withdrawals, or in averaging accounts when the date of the latest item of the account or any date subsequent thereto is taken as the focal date, in any of which cases, if the focal date in averaging accounts or the date of settlement in the remaining cases is once adjusted to the 365 mark of the fixed scale, the number of days from the anterior date of each considered item to the date of settlement can be found without further adjustment by looking upon the revolving scale for the date of each considered item, and the number of the opposite divisional mark on the inner fixed scale will denote the days in the interval between the date of settlement and the date of each item.

In order to use large figures which easily catch the eye, the subdivisions are indicated by alternating long and short marks, which avoids the necessity of putting all the figures in a row, and hence enables them to be made larger.

In making use of my invention I may use other materials than those already mentioned in the construction of the instrument above described, as zinc, tin, card-board, or heavy paper. I may also modify the construction of the cheaper instruments so that the scale C may revolve in the space between the two fixed scales A B without using a depression or bed, in which case the fixed scales may be printed or stamped upon a circular piece of zinc, tin, card-board, or other cheap material. In the center of this circular material will be a circular hole about three-eighths of an inch in diameter to admit the insertion of a pivot or axis, around which will revolve a narrow circular band connected by light radial rods with the revolving scale, as shown in Fig. 3, the upper portion of the pivot or axis being threaded for a nut, which, when applied, will fasten the revolving scale after adjustment to the fixed scales. I may also in manufacturing the cheaper instruments for advertising or other purposes dispense with the inner fixed scale B, and in lieu thereof have the outer fixed scale doubly numbered in figures of different colors—that is, consecutively numbered from left to right in figures of the same color as the divisional marks—say black—from 1 to 365, both inclusive, and consecutively numbered from right to left in figures of a different color—say red—which are printed or stamped immediately over the black

figures from 1 to 365, both inclusive, the number 365 being the initial point for both sets of numbers, as already described, being printed or stamped in larger figures of one color only.

Having thus described my invention, what I claim as new is—

1. A time and date calculator consisting of two stationary concentric circular scales, the one numbered from 1 to 365 in one direction and the other numbered from 1 to 365 in the opposite direction, combined with a rotary adjustable circular scale divided into the same number of subdivisions as the stationary scales, and having said subdivisions grouped into the twelve months of the year and marked with the names of the same, substantially as shown and described.

2. A time and date calculator consisting of two stationary concentric circular scales A B, numbered in opposite directions from 1 to 365 and spaced or separated from each other, combined with a sliding circular scale C, arranged between A B and divided into three hundred and sixty-five subdivisions, and having said subdivisions grouped into and marked with the names of the twelve months of the year, substantially as shown and described.

3. A time and date calculator consisting of a base-frame having two fixed scales A B thereon graduated and numbered, as described, and having a groove or depression *a* between them and extending beneath the edges of the fixed scales, in combination with a circularly-sliding band C, graduated into an equal number of subdivisions as the fixed scale and grouped into and marked with the twelve months of the year, cross-pieces *b*, fixed to the under side of the circular sliding band at the division-points of the months and extending at their ends beneath the fixed scales, and knobs *c*, fixed to the top of the sliding scale at points above the cross-bars, substantially as shown and described.

WILLIAM R. WILL.

Witnesses:
FAIRMAN A. SADLER,
W. H. PATRICK.