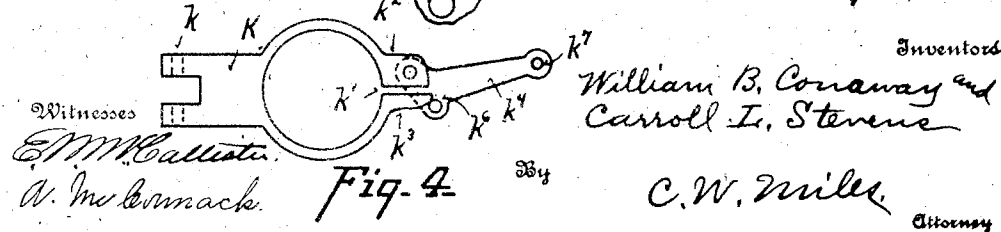
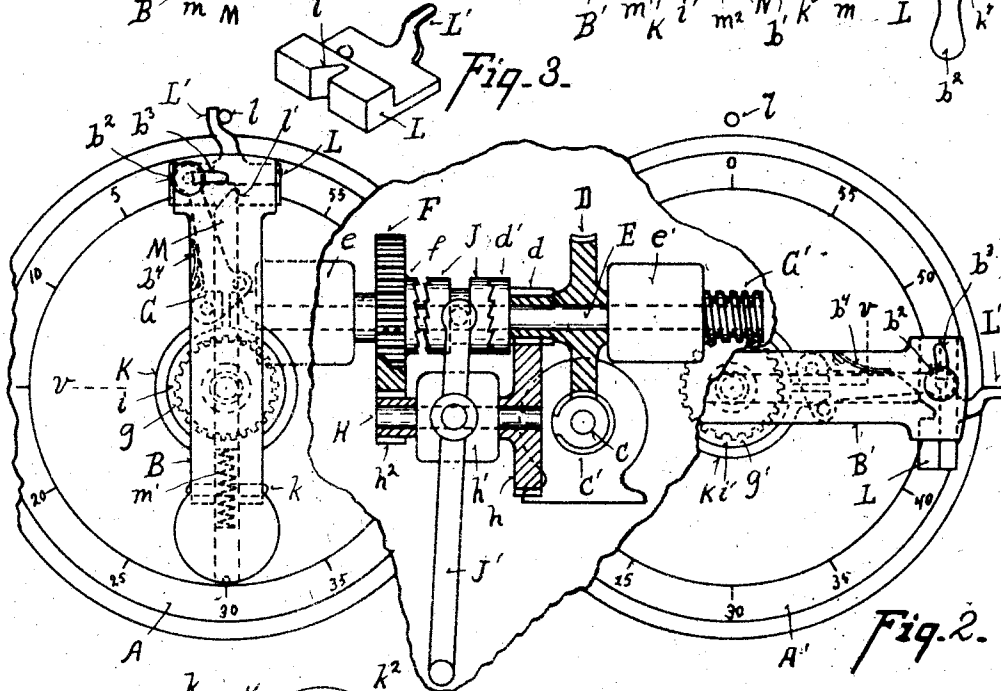
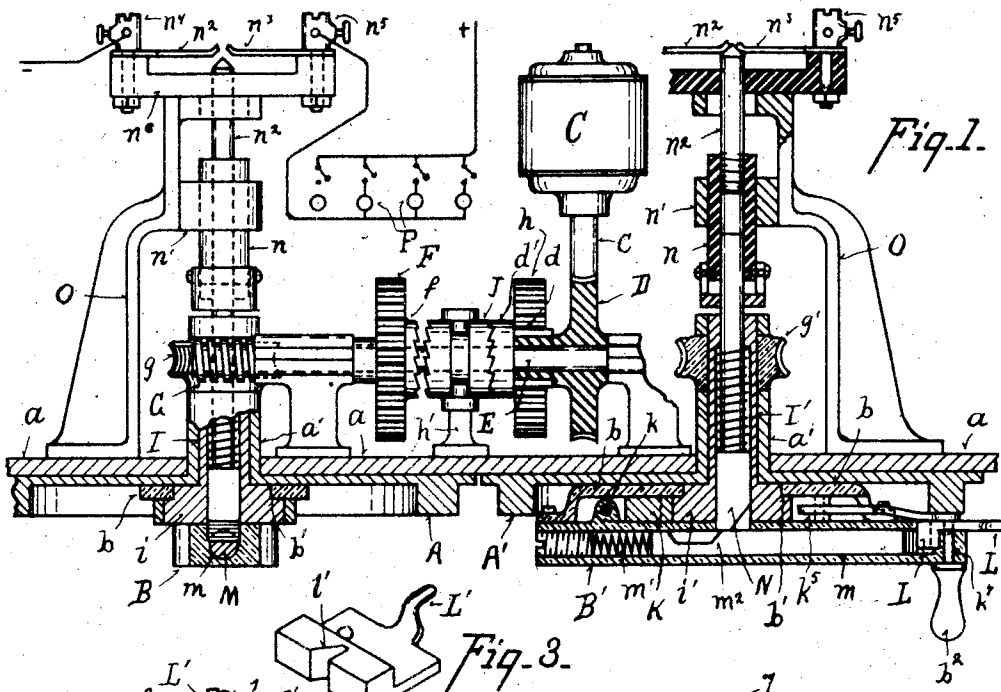


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 PHOTOGRAPHIC PRINTING APPARATUS.
 APPLICATION FILED JAN. 30, 1909.

945,697.

Patented Jan. 4, 1910.



Witnesses
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Fig. 4

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UNITED STATES PATENT OFFICE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, WILLIAM B. CONAWAY and CARROLL L. STEVENS, citizens of the United States, residing at Aurora, in the county of Dearborn and State of Indiana, have invented certain new and useful Improvements in Photographic-Printing Apparatus, of which the following is a specification.

Our invention relates to improvements in photographic printing apparatus.

One of its objects is to provide improved mechanism to illuminate the print or printing frame for the desired length of time, and then cut off the light.

Another object is to provide means whereby the speed of the driving or transmitting mechanism can be varied to provide for long exposures or short exposures.

Another object is to provide improved means for controlling the lighting circuits.

It further consists in certain details of form, combination and arrangement, all of which will be more fully set forth in the description of the accompanying drawings, in which—

Figure 1 is a horizontal section on line *v v* of Fig. 2, through the dials and cabinet front, and showing part of the driving and light controlling mechanism in elevation. Fig. 2, is a front elevation of the dials, with part of the cabinet broken away to show the driving mechanism, part of which is shown in elevation and part in central section. Fig. 3, is a perspective view of a sliding latch plate detached. Fig. 4, is a plan view of a clutch ring and its clamping lever detached.

Our improved mechanism is adapted to be used in connection with a cabinet having one or more openings to receive photographic printing frames, and within the cabinet preferably a series of electric lights so arranged to illuminate the face of the printing frame when in circuit.

In order to secure with accuracy the exact quantity of light necessary to print the photographs we provide one or more dials *A*, *A'* one for each printing frame, which are preferably secured to the wall *a* of the cabinet, preferably below the respective printing compartments. Hands or pointer members *B B'* are loosely journaled so as to travel over the face of the dials, and when clutched to the driving mechanism, to be driven at a uniform rate of speed over the

face of the dials until they reach the zero point on the dials when they are automatically tripped to release the clutch mechanism, and also to break the circuit through the lights which illuminate the printing frame.

The pointer members are power driven preferably by an electric motor *C* of either shunt or alternating type, which we find will, under ordinary circumstances run at a sufficiently uniform rate of speed for the purpose. The motor shaft *c* is provided with a worm *c'* which meshes with and drives a worm wheel *D* loose on shaft *E*. The hub of worm wheel *D* carries a pinion *d* and a clutch member *d'*, which also travel loosely on shaft *E*. A spur gear *h* carried by a shaft *H* meshes with and is driven by pinion *d*. Shaft *H* is supported in a journal box *h'*, and at its opposite end carries a pinion *h²* which meshes with and drives a spur gear *F* loosely mounted on shaft *E*, said gear *F* carrying a clutch member *f*. The ratio of the gears *d h h² F* is preferably such that the gear *F* travels at one fifth the speed of the pinion *d*.

The shaft *E* is mounted in journal boxes *e e'* and provided at opposite ends with worms *G G'* which mesh with and drive worm wheels *g g'* which are rigidly secured to the hollow shafts *I I'* which are journaled in the hubs *a'* of the dials *A*. The forward ends of the shafts *I I'* are enlarged to form clutch members *i i'* to which the pointer members *B B'* are clutched when in use. A clutch member *J* splined to the shaft *E* is adapted to be shifted endwise on shaft *E* by means of a lever *J'* which is pivoted to the journal box *h'* so as to shift clutch member *J* into engagement with clutch member *d'* or clutch member *f* as desired, to change the speed of shaft *E* relative to that of motor *c*.

The pointer members *B B'* are pivotally supported in position by means of yokes *b* attached to their inner faces and journaled in recesses *b'* formed in the clutch members *i i'*. Pointers *B B'* are provided with ring shaped clutch members *K* pivoted to the pointers at *k* and split at *k²*, and adapted to grasp the clutch members *i i'* and to thereby cause the pointers, *B, B'*, to travel over the face of the dial. The ends, *k², k³*, of the split ring are closed together to grasp the member, *i*, or *i'*, by means of a lever, *k⁴*, which is let into a recess, *k⁵*, in the ends,

k^2 , k^3 , and pivoted to the end, k^2 . A pin, k^4 , as lever, k^1 , is moved to the right engages the cam face of the end, k^3 , and closes the two ends, k^2 , k^6 , together to grasp member, i , or i' . The opposite end of lever, k^1 , is attached by a pin, k^7 , to a sliding latch plate, L, mounted in ways on pointer, B, or B', said latch being provided with a finger, l' , to engage a stop pin, l , and a beveled notch, l' , to be engaged by the beveled nose of latch bar, M, which is mounted in a recess, m , in the pointer, B, or B', and actuated by a spring, m' , to hold it in engagement with the latch plate, L. The latch bar, M, has a beveled or cam face, m^2 , which is adapted to be engaged by the forward end of a spring actuated plunger, N, which is seated in the bore of the shaft, I, or I'. The opposite end of plunger, N, carries an insulated sleeve, n , which slides in a bearing, n' , in the bracket, O, and has at its opposite end a point n^2 of electrical conducting material insulated from its supporting and actuating mechanism, which serves by its endwise movement to make and break the circuit through the lights, P, which serve to illuminate the printing frame, by means of spring contact points, n^3 , n^4 , and binding screws, n^5 , n^6 , carried by an insulator, n^7 , mounted on the bracket, O.

The operation is as follows: The motor, C, is started, the lever, J' , shifted to engage member, J, with either member, d' , or f , as desired. A printing frame is prepared and attached in place on the cabinet. Then the handle, b^2 , of pointer, B, is grasped and the pointer moved to the left the desired number of divisions on the dial and the handle released. The handle is attached to latch plate, L, by means of the stem k^2 passing through a slot, b^3 , in member, B, and the pressure on the handle in moving pointer, B, to the left holds the latch, L, in the position relative to pointer, B, shown at the left of Fig. 2. As soon as the handle, b^2 , is released by the operator, the spring, b^4 , pressing against lever, k^2 , throws the latch, L, to the position indicated at the right hand pointer, Fig. 2, which automatically forces the latch bar, m^2 , backward, which in turn forces the plunger, N, endwise and closes the circuit at contacts, n^3 , n^4 , through a series of electric lights, P, and illuminates the printing frame. The lever, k^1 , also by pin, k^2 , closes the clutch ring, K, upon the member, i , which causes the pointer to move slowly toward the right, driven from the motor, C. This movement of the pointer continues until the finger, l' , reaches the pin, l , when the latch, L, is thrown to position to release the clutch ring, K, and to open the circuit through the lights P, at the contacts, n^3 , n^4 , when the printing frame can be removed and another inserted. When the clutch members, J, d' , are engaged, we prefer to have the pointers, B, B',

encircle the dials in one minute, and when members, J, f , are engaged, to have the pointers encircle the dial in five minutes, but other proportions and periods may be employed.

The mechanism herein illustrated and described is capable of considerable modification without departing from the principle of our invention.

Having described our invention, what we claim is:

1. In a mechanism of the character indicated, an indicating dial, a pivotally supported pointer adapted to travel over the face of said dial, a driving shaft journaled concentrically with said pointer, a clutch member carried by said pointer and adapted to lock said pointer to said driving shaft, a latch member carried by said pointer and adapted to be tripped at a predetermined point to release said clutch member and stop said pointer, a pair of contacts controlling an electrical circuit, and a contact actuated by the movements of said latch member to alternately open and close said electrical circuit.

2. In a mechanism of the character indicated, an indicating dial, a pivotally supported pointer adapted to travel over the face of said dial, a driving shaft journaled concentrically with said pointer, a clutch member carried by said pointer and adapted to lock said pointer to said driving shaft, a latch member carried by said pointer and adapted to be tripped at a predetermined point to release said clutch member and stop said pointer, a sliding latch bar carried by said pointer and actuated by the movements of said latch member, an electrical circuit having a plurality of contact points, a plunger mounted in the bore of said driving shaft and carrying a movable contact, said plunger being actuated by the movements of said latch bar to move said contact to alternately open and close said electrical circuit.

3. In a mechanism of the character indicated, an indicating dial, a pivotally supported pointer adapted to travel over the face of said dial, a driving shaft adapted to travel at a substantially uniform rate of speed, a clutch member carried by said pointer and adapted to alternately engage and disengage said pointer with said driving shaft, a handle carried by said pointer and adapted to be employed by the operator in setting said pointer relative to said dial, means for disengaging said clutch during the movement of said pointer by said handle, a latch carried by said pointer adapted to disengage said clutch at a predetermined point to stop said pointer, a pair of electrical contacts, and a contact actuated by the movements of said latch to close an electric circuit through said electrical con-

tacts and an electric light employed to illuminate a photographic print, while said pointer is engaged with and being driven by said shaft, and to break said circuit at
 5 said electrical contacts open said circuit when said pointer is disengaged from said shaft.

4. In a mechanism of the character indicated, an electrical circuit, an indicating
 10 dial, a pointer adapted to travel over the face of said dial, a shaft adapted to drive said pointer, a clutch member carried by said pointer adapted to alternately engage and disengage said shaft, a motor adapted
 15 to travel at a substantially uniform rate of speed, speed changing mechanism interposed between said motor and said pointer driving shaft, means controlling the change of speed of said pointer driving shaft relative
 20 to the speed of said motor, and a spring actuated latch carried by said pointer, the movements of said latch controlling the movements of the clutch member employed to clutch said pointer to its driving shaft
 25 and to control the movements of a contact serving to open and close said electric circuit in which is included an electric light employed to illuminate a photographic print, and means to actuate said latch to stop said
 30 pointer at a predetermined point.

5. In a mechanism of the character indicated, in combination with one or more indicating dials having pointers adapted to travel over their faces, with means for automatically tripping and stopping said pointers

at predetermined points, a motor adapted to travel at a substantially uniform rate of speed, a shaft adapted to receive motion from said motor at different ratios of speed, means for changing the ratio of speed of
 40 said driven shaft, and mechanism transmitting motion from said driven shaft to one or more shafts employed to drive said pointers.

6. In a mechanism of the character indicated; an indicating dial, a pointer adapted to be driven over the face of said dial at a substantially uniform rate of speed, a clutch member carried by said pointer and adapted to engage and disengage said pointer
 50 with its driving shaft, a spring actuated latch moving in unison with said clutch, means for tripping said latch at a predetermined point to release said clutch and stop the pointer, a pair of electrical con-
 55 tacts forming the terminals of an electrical circuit, and a contact actuated by the movements of said latch to close said electric circuit at said electrical contacts while said clutch member is engaged to drive said
 60 pointer, and to open said circuit when said clutch member is disengaged.

In testimony whereof we have affixed our signatures in presence of two witnesses.

WILLIAM B. CONAWAY.
 CARROLL L. STEVENS.

Witnesses:

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 HARRY R. McMULLEN.