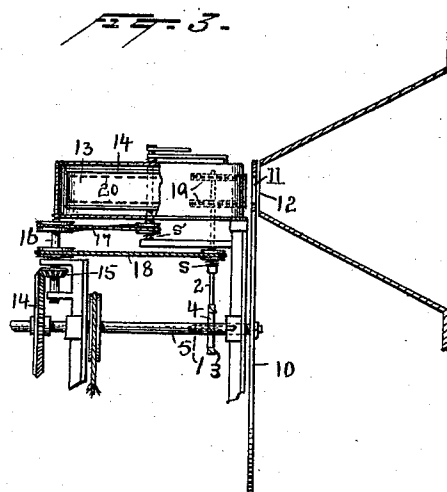
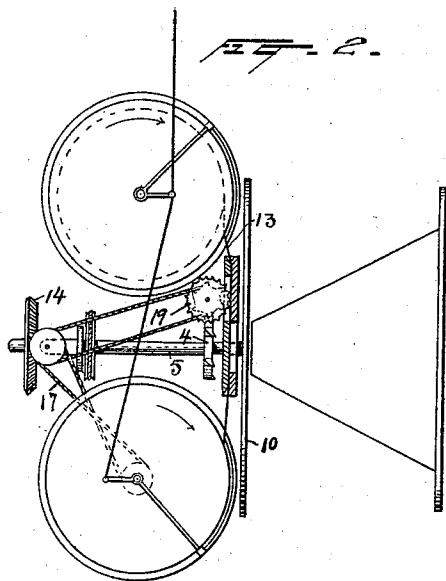
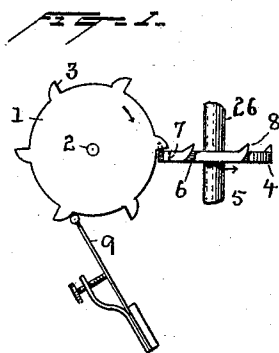


(No Model.)

T. A. EDISON.  
STOP DEVICE.

No. 491,993.

Patented Feb. 21, 1893.



Witnesses  
Norris A. Clark.  
W. F. Clark.

Inventor  
T. A. Edison  
By his Attorney  
Syer & Suly.

# UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF LLEWELLYN PARK, NEW JERSEY.

## STOP DEVICE.

SPECIFICATION forming part of Letters Patent No. 491,993, dated February 21, 1893.

Original application filed August 24, 1891, Serial No. 403,535. Divided and this application filed April 11, 1892. Serial No. 428,614. (No model.)

### *To all whom it may concern:*

Be it known that I, THOMAS A. EDISON, a citizen of the United States, residing at Llewellyn Park, in the county of Essex and State of New Jersey, have invented a certain new and useful Improvement in Stop Devices, (Case No. 950,) of which the following is a specification.

The present invention relates to devices adapted to stop a driven drum or shaft for an instant and then to allow the same to move forward and so on in rapid succession.

The main object of the invention is to provide such a device which shall operate with unerring certainty and with great rapidity, the construction preferably being such that the periods of rest shall be longer than those in which the device is moving forward.

The invention consists in the combinations hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a plan view of the detent device; and Figs. 2 and 3 are plan and side views respectively, showing the device applied to a photographic apparatus.

In my application (Case No. 929,) filed August 24, 1891, Serial No. 403,535, I have shown and described this stop device applied to an apparatus for taking pictures of moving objects, and the present application is a division of that application, only a part of the photographic apparatus, however, being shown.

The detent device consists of a wheel 1 on a shaft 2, which when the device is in use is given a tendency to rotate by suitable power. The wheel 1 has projecting teeth 3, six being shown, which teeth are adapted to strike against the face of the co-operating detent or stop wheel 4 on a shaft 5, which is constantly driven by a suitable motor. The wheel 4 has a corresponding number of notches 6 at regular intervals around its periphery. These notches, the depth of which is indicated by the dotted line 7, Fig. 1, are of such shape and size that the teeth 3 can pass through them when the wheels 1 and 4 are rotated in the direction of the arrows. Each tooth in succession will strike the face of wheel 4, thereby bringing wheel 1 and shaft 2 and parts geared thereto, absolutely to rest, and after the lapse of a moment the tooth will pass through the

notch next below it, allowing the wheel 1 and shaft 2, and parts driven thereby, to move another step. To avoid the danger of wheel 4 moving so quickly that a tooth cannot enter the proper notch, an extending lip 8 is provided adjacent to each notch. The lips 8 extend laterally from the face of wheel 4 toward which the teeth on wheel 1 move, as distinguished from teeth extending radially. As this lip comes up under a tooth 3, it will guide the tooth into the notch.

9 is a detent spring or pawl to prevent backward movement of the wheel 1.

I prefer to so proportion the parts above described when they are to be used in my photographic apparatus, that the wheel 1 is at rest for nine-tenths of the time in order to give a long exposure of the sensitive film, and is moving forward one-tenth of the time, said forward movement being made to take place from thirty to fifty times per second. On the shaft 5, or on any suitable shaft driven by the motor, is a revolving disk 10 serving as a shutter for alternately exposing and covering the sensitive film. This disk, which is continuously revolving, is provided with suitable apertures 11 near its edge in such position that as the shutter is rotated the apertures pass directly between the camera opening 12 and the sensitive film 13 at a point midway between the reels, from one to the other of which the film is wound, as described in my application Case No. 929. On the motor shaft is a beveled wheel 14 gearing with a wheel 15 on shaft 16, which shaft is connected to the axis of one of the reels above referred to by a cross-belt 17, and to the shaft 2 by a straight belt 18, the pulleys on shaft 2 and the axis of the reel being frictionally connected with their shafts so as to constitute a yielding driving connection. This frictional or yielding driving connection may be formed by placing springs S, S' on the spindles adjacent to the loose pulleys, as shown in Fig. 3, the upper ends of the springs pressing against (but being otherwise unconnected from) the lower faces of the pulleys and having sufficient tension to connect the pulleys with the spindles when little power is required to drive the apparatus, but allowing the pulleys to slip when resistance to movement of the apparatus increases. Since this

is a well known way of connecting pulleys to their shafts, and since other yielding or frictional connections may be used, the construction is not shown in detail, but is indicated merely in the drawings. At the upper end of shaft 2 are two feed-wheels 19, the teeth of which are adapted to engage the perforations 20 in the film 13 to advance the same.

With the arrangement described, when the driving shaft 5 is rotating, that is, when the apparatus is being used, it will be evident that detent wheel 4 will be driven continuously, and that shaft 2 and wheels 19 will be driven except when said parts are positively held from forward movement by the detent device described. At such times the frictional driving connection slips. The result is that until a tooth slips through a notch in the detent wheel, the film 13 will be at rest, but when said tooth passes through the notch the film will be advanced another step. This movement is so timed that an opening 11 will be in the position shown in Fig. 3 while the film is at rest, and while the film is moving a solid part of the disk 10 will be in front of the opening 12.

Evidently the stop device described is not confined to the use above indicated. The form of the teeth and notches, as well as their number, may be varied to some extent without departing from my invention.

What I claim is—

1. A detent or stop device consisting of a rotatable wheel or disk provided with notches or passages in its periphery, a wheel in a plane at an angle with the first mentioned wheel and provided with teeth adapted to pass through the notches or passages in the first mentioned wheel, and means for driving both of said wheels, said means being distinct from

said wheels themselves substantially as described.

2. A detent or stop device consisting of a rotatable wheel or disk provided with notches in its periphery, laterally extending lips adjacent to the notches, and a wheel tending when the device is in use to turn in a plane at an angle with the first mentioned wheel and provided with teeth adapted to pass through the notches in the first mentioned wheel, substantially as described.

3. A detent or stop device consisting of a rotatable wheel provided with six notches in its periphery and arranged at regular intervals, a second wheel tending when the device is in use to rotate in a plane at right-angles to the first mentioned wheel and provided with six teeth adapted to pass through the notches in the first mentioned wheel, and means for driving both wheels, said means being distinct from the wheels themselves, substantially as described.

4. A detent or stop device consisting of a rotatable wheel provided with notches in its periphery and arranged at regular intervals, a driving shaft for said wheel, a second wheel in a plane at an angle to the first and provided with teeth adapted to pass through the notches in it, driving means distinct from said first wheel for rotating said second wheel, and a yielding driving connection between said wheel and driving shaft, substantially as described.

This specification signed and witnessed this 5th day of April, 1892.

THOMAS A. EDISON.

Witnesses:

JOHN F. RANDOLPH,  
THOMAS MAGUIRE.