A NEW HIGH-SPEED PHOTOGRAPHIC SHUTTER.

It is obvious that a "between-lens" shutter which opens from the center outward and closes again in the reverse direction will overexpose some portion of the plate and underexpose others. When the speeds are higher than 1/150 of a second, the imperfect illumination is very apparent. In order to remedy this defect and to render possible exposures of 1/1,000 of a second and less, the focal plane shutter was adopted. As every photographer knows the focal plane shutter consists of a curtain provided with an adjustable slit and mounted to travel in front of and parallel to the plate. By regulating the tension of the springs which drive the curtain, and by adjusting the width of the slit, higher or lower speeds are obtained. Because the plate is exposed by the slit in sections curious distortions in moving objects invariably result, for the reason that during the interval in which the slit travels from one given point to another the object has moved ahead, so that the position of the object relatively to the plate is not sufficiently constant. At its highest speed, the efficiency of the focal plane shutter decreases as the slit is narrowed, because the light rays suffer interference, so that serious speed limitations are imposed. To overcome these defects in illumination, photographers soon began to use lenses of large aperture on very small cameras to allow more distance between the object and the lens and to concentrate a greater amount of light on the plate. Thus it happened that lenses working at apertures of f.5 or even f.3[4] superseded lens working at f.6[8] with a consequent sacrifice in definition.

Mr. Gustav Dietz, a New York inventor, has given the problem not a little thought, and seems to have solved it satisfactorily. Abandoning the focal plane principle entirely because of the objections to sectional exposures, he has returned to the "between-lens" shutter and invented a form of blade which permits a brilliant uniform illumination of the plate, and renders it possible to use slower lenses at speeds of 1/2,000 part of a second, with the result that admirable definition is secured without any distortion of the image.

The "multispeed" shutter, as Mr. Dietz calls his invention, is driven by an adjustable spring which is coiled around a spindle carrying at its outer end a bevel gear meshing with the segmental rack of a driving-ring *d*. The driving-ring travels on ball bearings in both directions. Four blades, *c*, are pivoted to this driving ring and are moved with the ring when the tense spring is released. Each blade is centrally slotted to receive a pin, by which its movement is guided in such a manner that the blade is gradually opened, thrown open quickly, and gradually closed again without any side or central strain whatever, having completely turned over and fully exposed the plate. No matter what the speed may be, whether a time exposure of several seconds or a snapshot of 1/2,000 part of a second, the same revolution of the blades occurs. The shutter opening thus attained is peculiar. The lens is opened from the center in an increasing star, and the blades spread full in the middle of the movement, closing again from a different point of the lens-aperture's periphery and thereby exposing the corners of the plate more than the center. Vignetting is consequently impossible even with high speeds, large plates, and wide-angle lenses. Because no diaphragm stops are used to secure an increase of definition as with the focal plane shutter, no light is lost, and yet definition is vastly augmented, and because of the excess circumferential illumination very high speeds are possible even on dull days.

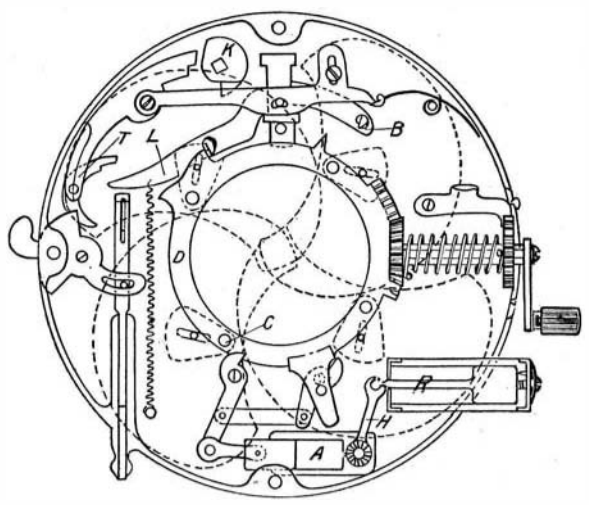
Exposure $\frac{1}{1000}$ seconds; f. 6[8].

Exposure $\frac{1}{1000}$ seconds; f. 5[6].

Exposure $\frac{1}{2000}$ seconds; f. 5[4].

Three Difficult Subjects Taken With the Multispeed Shutter. The Good Definition Should be Noted.

Not the least striking feature of this shutter is its noiselessness. On the higher speeds the blades are arrested without shock by an air-cushion, *A*, which is controlled by the link *H* of the piston *R*. For speeds of 1/200 of a second and less the knob of the retarding piston is connected with the driving ring. Hence the air-cushion is opened at the same time, and the ring and blades move slow or fast according to the tension of the coiled spring. The retarding device simply forces the spring to spend the motive power slowly. It is therefore clear that the higher the tension, the quicker the exposure, which increase is absolutely uniform in ratio to the increased spring tension. For bulb or time exposures, which are set by means of a knob *K*, the ring is stopped half way by a lever *B*, which is brought into engagement with a hook on the ring when the principal release lever *L* is raised. In setting the shutter for time exposures, a lever *T* is employed, which locks the principal release and also the bulb lever and is unlocked by a second action of the release mechanism. Slow, instantaneous, bulb, or time exposures are quite noiseless because of the retarded action of the driving ring. Without this retarded action, bulb and time exposures are quick-acting and clicking. The compound movement of the four blades is kept for instantaneous exposures of several seconds duration on account of the vastly increased definition, which renders objects out of focus only softer, but never indistinct. This should be of special value for portrait and landscape studies, when instead of a sharp-cut effect a uniform softness is desired. Objects quite indistinct on the ground glass are brought back to soft definition again.



The Operative Mechanism of the Multispeed Shutter.

The different speeds are recorded on a ring which is geared to the tension wheel of the spring and travels in a groove around the shutter casing. The release is effected either by hand or by cable.

The shutter can be applied to any camera for any class of work.

Wireless Message on Atlantic Coast Received in California.

On Sunday, March 10, A. J. Millison, the operator at the wireless telegraphy station on Point Loma, in southern California, observed his apparatus intercepting a message. On investigation he ascertained that a message was being sent from Washington, D. C., to Pensacola, Fla. He adjusted his instruments, which are the most delicate used by the United States government, and caught the whole message. At about the same time part of a message to the battleship "Connecticut" from Washington was clearly read on the instruments at Point Loma.

Highly gratified, the operator sent messages to the Atlantic coast, and received answers from the operators at Washington and Pensacola. Later he wrote out copies of the messages that he intercepted on the Atlantic coast and sent them, with letters, to the operators there.

The distance from Pensacola to San Diego in an air line is about 1,800 miles, and from Washington to San Diego is about 2,400 miles. The matter has been reported to Commander H. C. Gearing, Chief of the Equipment Department at Mare Island navy yard, California. The messages sent by the operator at Point Loma to Washington were only faintly recorded on the instruments, but the messages between Washington and Florida and part of a message from Washington to the battleship "Connecticut," 600 miles out in the Atlantic Ocean, were recorded clearly. The new apparatus is partly the invention of Mr. Millison, and has been installed in the Point Loma station only a few months. Some time ago the Point Loma operator succeeded in communicating with Tacoma, Wash.

Performing Acrobats Taken With the Multispeed Shutter. Exposure $\frac{1}{1400}$ Part of a Second; Lens Aperture f. 6[8].

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