

THE
MULTI-SPEED
SHUTTER

NEW YORK

LP 1147
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The Multi-Speed Shutter Company

Shutters for the Professional, the Amateur and Motion
Picture Machines. Specialties of new and orig-
inal construction for the advanced worker.

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THE MULTI-SPEED SHUTTER CO.

THE MULTI-SPEED SHUTTER COMPANY
317-319 E. 34th Street New York

THE
MULTI-SPEED
SHUTTER

NEW YORK



—THE DANCER

1-600 SECOND WITH MULTI-SPEED SHUTTER AND
FLASHLIGHT ATTACHMENT.

The above illustration and all others in this catalog are reduced from direct contact prints. In practically every case the image on the plate or film is larger than the reproduction. Prints from any of the negatives will cheerfully be sent to interested photographers.

FORE WORD

Since the Multi-Speed Shutter was first presented some years ago, its progress has been marked by a demand from those photographers whose experience has dictated to them the wisdom of securing the most efficient exposure-apparatus to be had. Press photographers, scientists and the more advanced amateurs have long since placed the Multi-Speed at the head of all the modern devices used in the art, and we have kept pace and even anticipated in the construction of our various products the advances made in photography. Our latest product, the Multi-Speed Jr., fully described in the following pages is but another step in our progress, opening as it does, the charm and fascination of high speed photography to the owners of even the smallest of cameras and placing in their hands the power to create pictures of infinitely more pleasing character.

Abroad, the recognition extended to the Multi-Speed has been just as favorable and, if anything, the enthusiasm has been greater. As an evidence of this, read the following extracts from an article written by Dr. Adolphe Abrahams, B. A., F. R. P. S., one of the well-known authorities on speed work in Great Britain, and printed in the "Photographic Monthly" of England during the latter part of 1910:

"My first exposures were made of familiar subjects for which with a focal-plane shutter I should have given exposures of 1-600 to 1-800 second approximately. I used a lens (Ross Homocentric) working at F 6.3, and I gave exposures said to be 1-300 to 1-600 second. The conditions were far from favorable—4 to 5:30 P. M. on a very dull day in July—but I obtained half a dozen results which were uniformly excellent, not only critically sharp but remarkably fully exposed; far more fully exposed than I should have obtained with a focal-plane shutter at the same speeds. * * * *

"I may digress, at this point, to say that I could not, and still cannot, completely understand how any shutter can possess a greater efficiency than a good focal-plane one. An American enthusiast describes the shutter as "accumulating light;" this is, of course, simple nonsense, but expresses the inexplicable nature of his experiences.

"The Multi-Speed Shutter, in a word, has an efficiency which appears appreciably to exceed that of a focal-plane shutter; and inasmuch as a lens type of shutter can always be used at a slower speed than a focal-plane for the same moving object, whilst still avoiding evidence of movement during the exposure, it follows that for two reasons the Multi-Speed prevents under-ex-

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1-1000 SEC. GOERZ. F. 6.8. STANDARD PLATE.
EARLY MORNING.

REDUCED SIZE.

posure better than its rival. But clearly there was another advantage of the Multi-Speed to be anticipated. It is well known that one (practically the only) disadvantage of the focal-plane shutter resides in the principle upon which the shutter works; the plate is necessarily exposed not as a whole but in successive strips, and on account of movement of the subject during the passage of the slit across the plate there arises in certain cases distortion—on the whole negligible—or blurring, so that unless an exceptionally fast-driven focal-plane shutter is employed, so fast that even in the best circumstances under-exposure is unavoidable save with a lens of inconveniently wide aperture, the photography of such subjects can never be successfully accomplished. Of these subjects I need not give many examples. The photographs of very rapid motor-cars or express trains



POLO. 1-1000 SEC. NOTE BACKGROUND.
EASTMAN FILM. 3a KODAK. TESSAR F. 6.8.

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taken at right angles to the camera are almost invariably distorted when a focal-plane shutter has been used, and even the runner, hurdler, jumper, weight-putter, or golfer, taken at very close range during the period of their maximum velocity and in the position of great



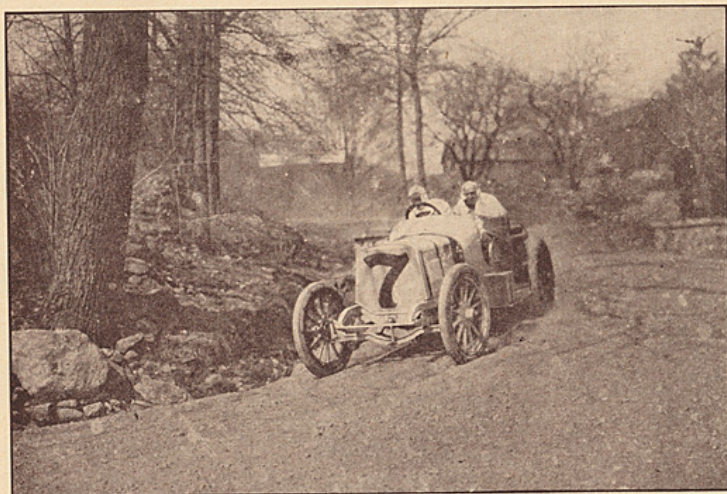
POLO. 1-1000 SEC.

REDUCED SIZE.

est displacement relative to the camera, are always blurred, and sometimes both blurred and distorted. My next tests, therefore, were upon some of these subjects, and the Multi-Speed **emerged fully triumphant.** Not the slightest evidence of blurr can be found in photographs taken under very exacting conditions; and again, the extraordinary light efficiency has led to full exposure. My tests, therefore, have led to the conclusion that the focal-plane shutter is beaten in moderately rapid work and hopelessly beaten in exceptionally rapid photography."

Commenting upon this remarkable endorsement of the Multi-Speed Shutter, the "British Journal of Photography," one of the best known authorities on photographic subjects, adds its unqualified endorsement to the statements made by Dr. Abrahams and forever settles the over-rated claims made for the focal-plane type of exposure mechanism. We reprint the editorial herewith:

"It is interesting to see from an article in the "Photographic Monthly" that Mr. Adolphe Abrahams has been experimenting with the "Multi-Speed" shutter, and



1-600 SEC. ADVANCED FOCUS. NOTE SOFTNESS OF BACKGROUND.

that he has obtained the same surprising effects that other workers have reported. He sums up his experiences by saying that 'the focal-plane shutter is beaten in moderately rapid work and hopelessly beaten in exceptionally rapid photography.' It seems that the apparent high speed of the "Multi-Speed" Shutter always surprises those who try it, but we doubt if the mystery is a difficult one to explain if we only remember the way in which the capabilities of the focal-plane shutter have been exaggerated. There is no doubt whatever that the speeds possible with the focal-plane shutter have been greatly overrated. Some time ago we pointed out the condition that must be fulfilled to attain a speed of one-thousandth of a second with this shutter, and showed that even with an extremely narrow slit such an exposure could only be realized with a blind moving at a rate that is almost incredible considering the mechanism that is available. In diaphragm shutters high speed of movement is more readily attained, especially when, as is the case with the "Multi-Speed," the movement is in one direction only and the driving spring is a powerful one. It is these two factors that give the "Multi-Speed" such an extraordinary advantage over the ordinary diaphragm shutter, which has a to-and-from movement of the shutter blades and driving springs of necessarily limited power. Then, again, in the matter of efficiency the focal-plane shutter has been overrated at high speeds. The smallest slit is necessary for the shortest exposures, and a one-eighth inch slit at a distance of five-eighths of an inch from the plate—not an unusual distance



1-2000 SEC. 6½-inch F. 6 DYNAR LENS.

REDUCED SIZE.

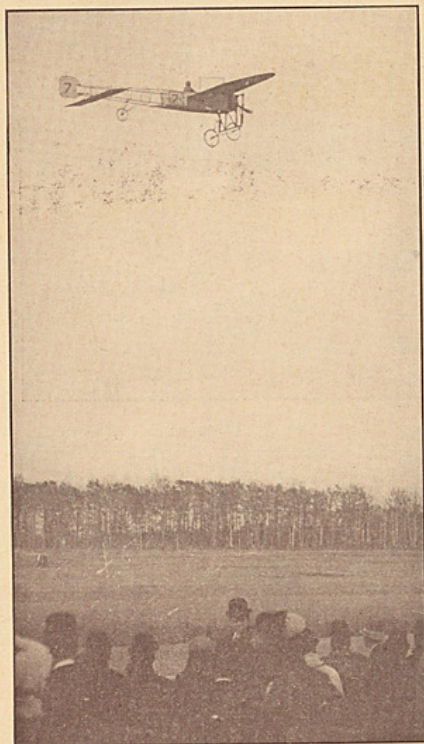
—has an efficiency of only 50 per cent. with a lens working at f-5. We can increase this low efficiency by using a lens of smaller aperture, but, of course, such a procedure lessens the efficient absolute exposure, and so we lose, instead of gaining anything; it, however, we substitute a diaphragm shutter for the focal-plane one, we can increase both the efficiency and the efficient exposure by simply using a shutter of large diameter, and so a "Multi-Speed" shutter of fair size relatively to the lens may, when working at a high speed, give just as much exposure to the plate as a focal-plane shutter working at a rather lower speed."

From these extracts from the foremost photographic publications it will readily be seen that even the careful scientists and photographic authorities of England admit the superiority of the Multi-Speed Shutter over the hitherto unbeaten focal-plane type.

In the following pages we briefly describe the principle and working plan of the Multi-Speed Shutter and, while we have tried to avoid too much technical language, we ask that the reader give that attention necessary for the proper understanding of any new and radically different device, feeling that the few moments so spent will bring such ample returns that we will both be the gainers.

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THE MULTI-SPEED SHUTTER AND THE MECHANICAL PROBLEMS WHICH IT OVERCOMES



AFTER SUNDOWN. 1-1000 SEC. NOTE THE PRACTICALLY STOPPED MOVEMENT OF PROPELLER.

as a grind stone is rotated. It is all a question of applied power properly directed and changed into speed.

MULTI-SPEED SHUTTER MOVEMENT EXPLAINED

The blade action of the Multi-Speed Shutter is so distinctly different from all other modes of opening the lens that it is frequently misunderstood or mentioned simply as "a rotating movement," giving the reader

To get high speed in a shutter movement is not so difficult as many believe, if the simplest laws of physics and mechanics are followed.

Power can either be converted into speed or speed into power. As examples—the lightly built racing aeroplane, where power is transformed into speed in addition to supporting its own weight; again, the racing automobile where a heavy body is moved at a tremendous speed without necessity of supporting its body.

Another example of how speed creates power is seen when a very light object travels with great power against a considerably stronger resistance. We have all read about the effect of cyclonic storms where pieces of straw have been driven into wood. Again, it is an easy matter to cut a piece of wood with paper by rotating the paper at a tremendous speed in the same manner



1-500 SEC. SIGMA PLATE.

the impression that the blades rotate around a fixed pin. This is not so. The blades of the Multi-Speed Shutter are pivoted to pins on the blade ring and the centres of the blades are carried along with the blade ring the full distance of its travel. A stationary pin is used at the same time to throw the blades over. This traveling of the blades around the circumference gives them a distinct compound motion; it starts them in a straight direction against the stationary pins, throws them over very quickly when the blade centres pass the pins and near the end of

the movement the blades recede from the stationary pins in an almost straight central direction.

The movement is best compared to that of a moving wheel, where, as the hub moves forward, the ends of the top spokes move twice as fast as those at the bottom. Therefore, those tips of the blades which make the exposure, move nearly twice as fast as the blade centre which is moving at the same time with the blade carrying ring.

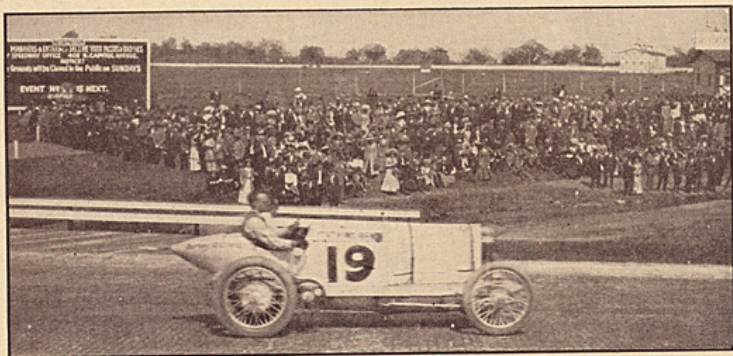


1-1000 SEC. 7-inch HOMOCENTRIC. F. 6.3.

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This movement is the ideal one for speed, as no side strains are in existence and all strains are taken up centrally on the blades.

To avoid losing power by friction, the blade ring is carried on highly polished steel balls, and is so sensitive that the slightest tension or additional tension causes it to increase the speed without losing anything by friction. This blade movement is controlled by a very highly efficient coil spring. The lowest tension, or about one-half turn, is sufficient to throw the shutter blades over and this lowest tension gives a speed of slightly more than 1-200 part of a second. As the winding of the spring is increased, it becomes more and more powerful; it is not only subjected to a bending but also to a torsional strain. Thus every additional turn will result in a considerably higher speed than the first turn.



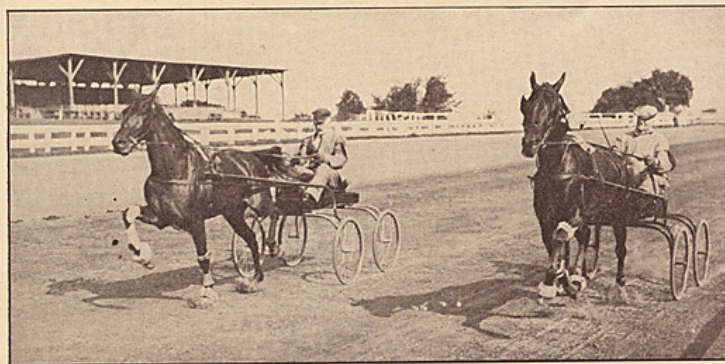
1-2000 SEC. BARNEY OLDFIELD BREAKING TRACK RECORD. MILE IN 35 SECONDS, OR 151 FEET PER SECOND. 3A KODAK, FILM.

A spring that is always subjected to a strain in one direction is bound to gradually lose its strength, and a spring has not yet been found which when wound up tight will go back to its original neutral point. The nearer a spring would come to this ideal state, the greater the chance of its breaking, especially if subjected to such shocks as a high speed shutter movement necessarily must give, where the blade ring is driven at a tremendous speed and is suddenly stopped. This jar is not alone felt by the driving ring and blades, but also necessarily reacts on the spring.

The Multi-Speed Shutter therefore has a spring which has a great elastic limit, and if it should be over-strained by too many repeated high exposures, it is only necessary to turn the spring in the reverse direction and hold it there for a few moments, when, on account of its elasticity, it will become normal again.

The chances of breakage are thus eliminated.

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1-600 SEC. SINGLE TURNER-REICH LENS. SIGMA PLATE.

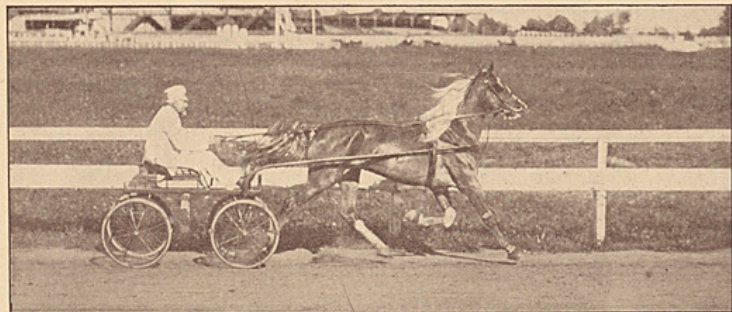
ACTION OF THE BALL-BEARING BLADE RING

The blade ring moves less than one-eighth of its circumference. This one-eighth is divided into three parts; one-fourth for starting, one-half for making the exposure, and the last one-fourth for stopping the mechanism on an air-cushion that takes up all jar. The actual movement of the ring during the exposure is therefore one-sixteenth of its circumference. Also, as the lens opening is uncovered by four blades working in opposite pairs, each blade takes care of only one-fourth of



9/4-inch PROTAR. 1-1000 SEC. REDUCED.

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1-1000 SEC. 10¼-inch CONVERTIBLE TURNER-REICH.

the opening. One-sixteenth of the circumference of the blade ring is one-third of an inch, and to achieve a speed of 1-2000 of a second, it is only necessary to drive this ring at the rate of six hundred and sixty-six inches, or fifty-five and one-half feet per second.

This blade ring is the only part that moves in a circle; and when it is remembered that it moves practically without friction upon ball bearings; that the blades which it moves are very light and that the proportion of leverage between tips and slot is about one to three, it will be seen that the high speeds obtained with the Multi-Speed Shutter are thus easily explained.

The spring which drives the shutter is made of the best imported piano-wire, strong, and at the same time highly resilient. Only one-half turn on this spring is necessary to make an exposure of 1-200 part of a second and the strain, which is both a bending and twisting one (getting stronger in proportion to the turns) requires only two and one-half turns to give the maximum speed.

The next thought that will enter the mind of the reader may be that no mechanism could stand such strain. This would be true if no provisions were made to absorb it in an effective and quick manner. For this reason, the Multi-Speed Shutter contains an air cushion which is engaged as soon as the blades have closed, and the rest of the movement of the blade ring is gradually retarded by the compression of air. It will be seen that the quicker the movement of the ring, the quicker also will be the compression of the air-cushion.

A Multi-Speed Shutter can be held in the hand, and when released on high speeds no jar can be detected.

Shutter speeds can be considered only in relation to the movement of the object. 1-25 of one second may give the result of stopped motion in one case out of ten, 1-50 may result in five good exposures out of ten, 1-100 might be efficient for this particular motion in all cases.

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The same idea of giving the highest speed permissible (according to light and conditions prevailing) must be applied to all motion work. The faster the motion, the higher the speed needed.

We are forced to show that many speed tables worked out for speed-work are not dependable and that the proper understanding of speed photography has been sadly muddled by such speed charts as are furnished with focal-plane shutters. If an object moves ten feet in one second, it will move half of ten, or five feet, in one-half of one second and so on. This same plain truth must be applied also to high speed work. If 1-500 part of one second shows a blurred object, 1-1000 will make it sharper to the extent of reducing the blurr one-half. If this reduction is not sufficient, then 1-2000 would be the next speed to be employed. No great difference should be noticed between 1-500 and 1-750, as 1-500 is generally sufficiently high to stop motion as such, but not sufficiently high to give a clear, sharp picture, especially if longer focus lenses are used.

The following speed table will give an approximate idea of safe speeds with the Multi-Speed Shutter:

Lowest tension ($\frac{1}{2}$ turn—1-200 second), is sufficient tension for all speed work met in city traffic, such as carriages and automobiles, even parallel to the plate. This tension can be used safely under unfavorable light conditions on race horses, trotters, athletics, if their movement is toward the camera.

Tension 2 (1 turn—1-500 second), is sufficient tension for all sports, races, athletics, when movement is in diagonal direction to the camera.



1-800 SEC. NO SUN. SIGMA PLATE.



1-800 SEC. REDUCED.

Tension 3 ($1\frac{1}{2}$ turns—1-800 second), is sufficiently high to arrest any motion parallel to the plate, except race horses, automobile races, fast flying baseballs, golf, polo and hurdling.

Tension 4 (2 turns—1-1300 second), and Tension 5 ($2\frac{1}{2}$ turns—1-2000 second), should be used for the last mentioned speed objects if the movements parallel to the plate are selected, or if large images are desired.

Note.—Tension 3 is the best speed for usual high speed photography.

That 1-2000 of one second is not such a formidable speed and that higher speeds may be employed, will be seen by the following:

A hard hit golf ball has an initial velocity of 300 feet per second. If an exposure of 1-300 is given, the golf ball will show movement of



1-500 SEC. COOKE LENS. F. 6.5. $\frac{3}{4}$ -inch FOCUS.

one foot, at 1-600 it will show 6 inches of movement, at 1-1200 it will show 3 inches of movement, at 1-2400 it will show $1\frac{1}{2}$ inches of movement—so with the latter high speed exposure the golf ball will appear about

twice as long as high. An exposure of 1-4800 will only reduce the movement to $\frac{3}{4}$ inch, so that even this speed is not sufficient to show arrested motion. The picture on another page will illustrate this point.



$\frac{9}{16}$ -inch GOERZ LENS. 1-1000 SEC.

Shutter, F. 6.3. Tessar Lens, 3A Kodak film) was sufficient for the car generally, it is hopeless to stop the upper wire spokes even with twice that speed. They are moving nearly twice as fast as the car or hub. (About 250 feet, as the rim width has to be deducted in calculating.)

At 1-3000 they would move 1-20 of a foot or more than 1-2 inch; at 1-6000 about 1-4 inch, and it is left to the reader's imagination to figure out the speed necessary to bring the exposure down to such figures that a wire, not heavier than 1-16 of an inch will not show more movement than its own width.

INCREASE OF DEFINITION—ANOTHER REMARKABLE FEATURE

It was a matter of general comment after the first examples of Multi-Speed Shutter work appeared, that our pictures of high speed work showed no effect of blurred back grounds, but exhibited a pleasing round-



1-1000 SEC. F. 6.8 LENS.

ness, with landscape and other surroundings preserved with a soft and pleasing definition.

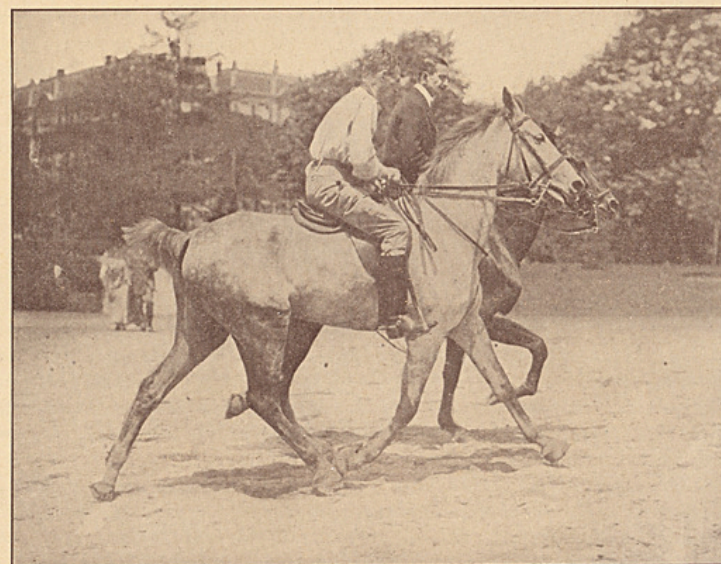
Our claims of increased definition through the use of the shutter were doubted, simply because such a radical departure from accepted principles seemed unbelievable. Yet it is very simple.

To dispel the least doubt, we refer the reader to page 26, where the diagram of the blade movement is shown. As the blades start to move, the shutter opens comparatively slowly, the opening movement carrying the blades against the stationary pin, turning them over very quickly and closing them again with gradually decreasing speed. As every stage of this movement figures as a diaphragm stop, the reader will readily see that the smallest opening acts the longest time operating on both ends of the movement, all intermediate stops in reverse proportion to their opening also twice, and the lens is fully open only for the shortest time during an exposure. The average stop valuation will thus be preserved. A plate will be exposed from a needle opening up to full opening and back again with such timing of the different stop values that the definition of objects out of focus is fully preserved, showing only softer outlines, which softness increases in proportion to distance. We do not recommend with the Multi-Speed Shutter the use of smaller stops than F. 11. They do not help the definition to any degree and only cut out light. F. 16 will have value for comparatively slow exposures, but then the same time should be given that would be with other shutters or lens caps.

MALTESE CROSS EFFECT AND ITS MEANING

As the blades of the Multi-Speed Shutter are carried around the lens opening, they jump a certain proportion of lens circumference and close on a different point of periphery, thus exposing the diagonal more fully, equalizing the illumination and giving lenses that will cover larger plates than they are listed for a chance to be worked at full opening on such larger plates.

The shutter movement, however, will not improve a poor or faulty lens, but will show the finest qualities a good lens possesses even if worked at full opening.



1-800 SEC. 9/4-inch PROTAR. REDUCED SLIGHTLY.

HOW LOW SPEED EXPOSURES ARE MADE

Only the high speed features of the Multi-Speed Shutter have so far been described. In order to make slower exposures than 1-200 second, a retarding cylinder located on the right side of the shutter is employed by connecting the piston link to the blade ring. The retarding cylinder contains a dry, perfectly fitting piston.

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The speeds are regulated by an air valve, which is operated by means of a cap on the end of the retarding cylinder. This cap shows engraved speed numbers from 1 second to 1-100 part of a second. If this spring is set to the lowest tension (only $\frac{1}{2}$ turn is necessary) and the desired speed is set against a mark on the retarding cylinder, the shutter will make the exposure in one continuous movement.

THE NOISELESS SHUTTER



1-1000 SEC. $\frac{9}{16}$ -inch PROTAR.

coats, and even their next neighbors have not been able to hear the slightest sound. How valuable this feature is in general work, portraiture and animal photography will easily be seen.

The reader well knows how difficult it is to photograph a child at play or a nicely posed figure with the ordinary shutter, as the clicking exposure ordinarily attracts the attention of the subject and spoils the exposure. Often the idea of being photographed will make a child and even grown up persons assume an attitude that is entirely strange to their acquaintances. How delightful and satisfactory it is to expose even for the longest fraction of a second without the knowledge of the subject.

These surprise pictures will be found to be invariably most charming, and will be valued highly, even by the unsuspecting sitter.

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SPEED OF LENSES

It is only necessary to refer to the editorials from the English papers reprinted in this catalog, to ascertain why the fastest lenses were necessary for high speed photography as long as the photographer had to depend upon the focal-plane principle. But as the makers of fast lenses, do not claim for them good depth of focus and admit but limited covering power, these lenses cannot be considered as good for practical all-round purposes as the lenses designed and made for slower speed. Most of the lenses with speeds of F 6.3, F 6.5 and F 6.8 will cover a much larger plate than they are listed for. They have a greater depth (as they are not constructed for the extreme marginal rays, that come to a focus with a wider cone) and do not blurr objects out of focus to the extent of the faster lenses. They are, therefore, much to be preferred for general all-round work. Now, if it can be proved that these lenses are fast enough for the highest speed work in connection with the Multi-Speed Shutter, we are only advising our prospective customers for their own good, if we recommend the general all-round lenses in preference to the extremely fast lenses.

A plain example of arithmetic will show how much we can expect by using a fast lens just for a few times. We will suppose that it is very dull light, and that an exposure with the lowest possible speed that could be applied to the subject has been made. We develop the plate and find that the only things visible are the high lights, such as sky and some white objects in the landscape. If we had used a lens twice as fast, we have gotten only twice as much and the plate would have been developed different from the first one taken with the slower lens. Now, if we bear in mind that five times under exposure or five times over exposure gives negatives that will give the same results on paper, providing the proper paper (hard or soft) is used, we can readily see that the faster lens has not been able to bring us within the latitude of a printable under exposure.

This simply proves that a fast lens cannot do the things that are impossible for slower lenses. If light conditions are very good, the fast lens undoubtedly will show a stronger negative, but the negative resulting from the slower lens is able to hold its own as a first class exposure, showing no speed movement, no thinness and will not require any special care in developing, but can be treated as if it was an ordinary bulb or time exposure.

SUBSTITUTION OF LENSES

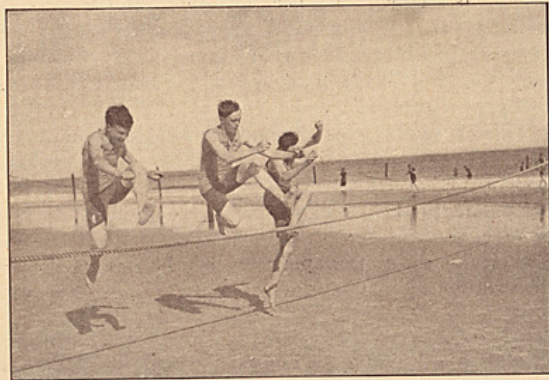
There are only a few persons to whom a lens faster than F. 6.8 will be of material benefit. In the following lines we will endeavor to explain how the efficiency of the Multi-Speed Shutter can be doubled by the substitution of lenses of the same speed.



1-1000 SEC. 9 1/4-inch PROTAR.

We will suppose that we are using a 9 1/2 inch lens on a medium Multi-Speed Shutter, the shutter aperture and lens aperture being of the same size. As a between-the-lens shutter, even ours, consumes a certain time before coming to a full opening and a certain time for closing again, the lens will not be fully open during the whole length of the exposure, but is only opened to its maximum during a short interval.

Suppose, now, we mount a smaller lens of the same speed to the same shutter aperture, a lens which contains in squares about one-half the receiving surface of the 9 1/2 inch lens. This lens will most likely be of seven inch focus. As this lens has a considerably smaller diaphragm aperture than the larger one this lens will be full open shortly after the blades have started their



FILMPACK 3 1/4 x 4 1/4. 1-1000 SEC. DYNAR LENS.

movement, and would show the larger lens only about one-half open. The smaller lens necessarily stands open when the shutter is near the closing point, whereas the larger lens would already have been half covered, so that the length of time that a smaller lens is full open is about twice as long as that of a larger lens; therefore, we get approximately twice the light efficiency with this combination and get approximately the same result as if we had used a lens which is twice as speedy as a 9 1/2 inch lens. As the seven inch lens working at 4.8 or a 6 inch lens working at 4.5 is the largest speed lens we could mount to the same aperture, the former explanation of minimum full opening holds good just as it did with the 9 1/2 inch lens. We see, therefore, that if we want to get more light, we can do two things; either put a faster lens of shorter focus on the shutter of medium size, which will be either a 6 or 7 inch lens; or put a slower lens of 7 inch in the same shutter, and the results in illumination are the same.

As these slower lenses have a better depth of focus and better covering power the photographer will only gain by this substitution. We think we have made this point so perfectly clear that we will not be accused of changing the speed of lenses. It is only the combination with such a movement as the Multi-Speed Shutter possesses that the seeming wonder is accomplished.

ALL LEARNED IN HALF AN HOUR



1-1300 SEC. F. 6.8.

The Multi-Speed Shutter is built on entirely new principles in order to insure the widest range of exposures, and the photographer who desires to use one must necessarily become accustomed to the new way of working a between-lens shutter. We claim as one of the most

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important points that the shutter is not automatic but is easily adjustable to any speed, going even so far as to allow corrections of the actuating spring. For the benefit of those who wish to do speed work successfully and learn to do it in the shortest possible time, we will state that half an hour's study of the Multi-Speed Shutter will give any intelligent worker the proper understanding of the device. We challenge comparison with the time consumed to understand and successfully work any modern focal-plane shutter.

ACTINOMETER READINGS

Exposure meters should not be used with the Multi-Speed Shutter, as they are misleading on account of the high efficiency of the blade movement. They should be followed, however, with small stops. The best exposure meter is the human eye. If light is so strong that the eyes are involuntarily slightly closed, high speeds can be used to the fullest extent, as the emulsion on a plate or film is also strongly affected by the intensity, but if the eyes can be turned against light objects or the sky without feeling the need of protection, speeds not exceeding 1-200 should be employed. When the very fastest plates are used it is possible to use even higher speeds under poor light conditions.

THE MULTI-SPEED "JUNIOR" SHUTTER

The Multi-Speed Junior is a simpler model of the Multi-Speed Shutter. It is semi-automatic, as far as setting is concerned, and the speeds are indicated on a scale and regulated by setting a pointer against the desired speed number. As it is impossible to



1-1000 SEC. REDUCED.

cover a range from 1-500 part of a second down to $\frac{1}{2}$ second on one single tension, this shutter is so constructed that TIME, BULB and INSTANTANEOUS exposures up to 1-200 part of a second are made on the lowest tension. A check is provided so that when the pointer is set to any speed number except 1-200 second, only the lowest tension

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can be given. When the pointer is put up to the 1-200 mark, either the lowest or two more higher tensions can be given to the spring by turning the spring key on the top of the shutter to succeeding notches on a round disc.

The slow instantaneous exposures are timed by a tripping device on the inside of the shutter, thus coming nearer to the scheme to which the general public is accustomed. The tripping action, however, in the Multi-Speed JUNIOR is so designed that the impact for holding the shutter open the desired time, is taken up by a flexible lever, thus eliminating any possible jar during the exposure.

It is impossible with this shutter to make any but the exposure for which it is set. From the 1-200 second speed up, two more tensions are provided, which gives a speed of not less than 1-350 and 1-500 second. THESE SPEEDS ARE GUARANTEED. The spring which actuates the shutter is a compensating spring, and will keep its strength uniformly, as the spring is always set with the key in alternate directions.

The shutter is provided with a separate diaphragm.

We will keep the Multi-Speed Junior on hand threaded to receive any special lens of $6\frac{1}{2}$ inch focus, or such lenses as are supplied for $3\frac{1}{4} \times 5\frac{1}{2}$ plate size. This shutter can be adapted to a straight front lens board of any Kodak or Camera by the photographer himself.

THE DIFFERENT TYPES OF MULTI-SPEED SHUTTERS

For roll-film cameras, we recommend the Multi-Speed Junior Shutter, it being designed especially for such use and having actual speed efficiency high enough to cover every ordinary high-class speed necessity. This shutter can be readily attached to the camera by the amateur himself.

In case the regular Professional Shutter is desired on roll-film cameras we recommend capping the lens in resetting the shutter. If this is not desired the regular shutter can be arranged to work in either direction. This model will not open in resetting.



1-1000 SEC. FILMPACK $3\frac{1}{4} \times 4\frac{1}{4}$. COOKE LENS F. 6.5.

THE MULTI-SPEED SHUTTER CO.

but on account of its reversing action is not so simple to operate, as the regular shutter.

Either Regular or Junior Multi-Speed Shutters can be used on any plate or film camera. For plate cameras and cameras using film packs, we recommend the regular Multi-Speed Shutter, which we specified above as the Professional Shutter. It is very simple to operate and is reset without reversing the spring, in fact it is more quickly reset than any other shutter.

HIGH SPEED FLASHLIGHTS

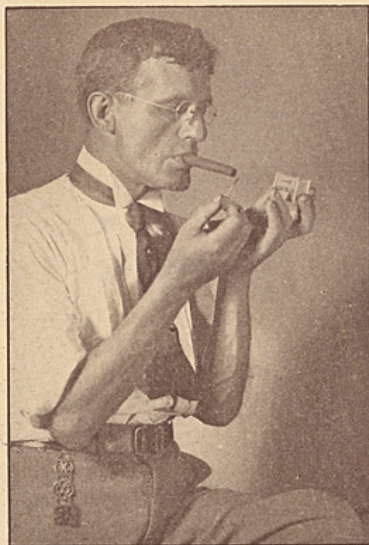
Many of the most important events of general interest to the devotee of high speed photography occur at night. Athletics, games of all kinds, armory drills, night street scenes and picture making possibilities

of all kinds which occur during the night have always been beyond the scope of the photographer. Scenes of the most compelling interest pass before his eyes without being impressed through his lens.

Now this is all changed. We have a perfected flashlight attachment by means of which it is possible for owners of Multi-Speed Shutters to make pictures at the highest speeds by means of artificial light. This apparatus is a simple attachment operating in connection with the Multi-Speed Shutter and attached to it by means of a screw on the back of the shutter. The exposures are made by electrical contact, the flashlight powder being ignited slightly ahead of the shutter movement so that the snap-shot is made at the highest efficiency of the flash.

Two or three composition trays are provided as containers, all being connected by electric wires.

By dividing the light into two or three separate sources great distribution of illumination is secured, which makes it possible to do prac-



1-200 SEC. FLASHLIGHT PORTRAITURE WITH M. S. FLASHLIGHT ATTACHMENT. AGFA POWDER 2 DRACHMS, 2 FLASHES.

THE MULTI-SPEED SHUTTER CO.

tically every kind of photographic work just the same as in full daylight. There is but one motion in making the picture. Press the shutter release and the exposure is made.



1-600 SEC. INSTANTANEOUS FLASHLIGHT.

The most ordinary precautions insure success as, due to the prolonged investigations we have given the subject, we have evolved a few simple rules which, if followed, are certain to produce pictures which will be considered for years to come as the most wonderful development in the photographic art since the invention of the Multi-Speed Shutter.



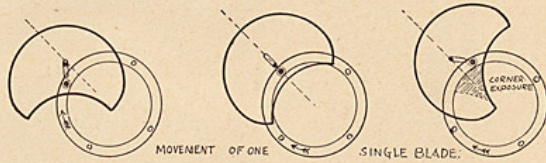
1-600 SEC. M. S. FLASHLIGHT ATTACHMENT. GOERZ F. 6.8.

The field is entirely new and fascinating beyond imagination. Think of being able to make pictures of children romping around the room, playing games, jumping, skipping the rope and ball playing, and being independent of all of the former "keep still" draw-backs usually associated with flashlight photography.

In portraiture the possibilities of the attachment have not yet begun to be realized. In making pictures of babies and of aged and nervous persons and groups of children the process is wonderfully simplified. To

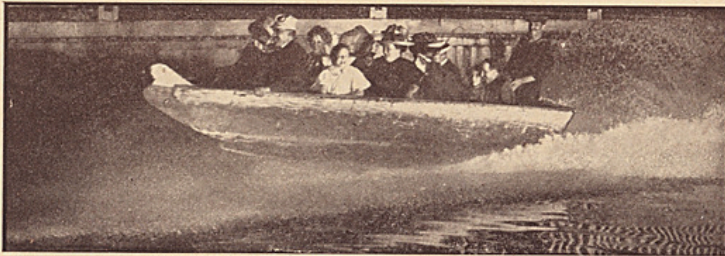
THE MULTI-SPEED SHUTTER CO.

the press photographer the attachment is a necessity, rendering it possible for him to guarantee to his paper results under any conditions



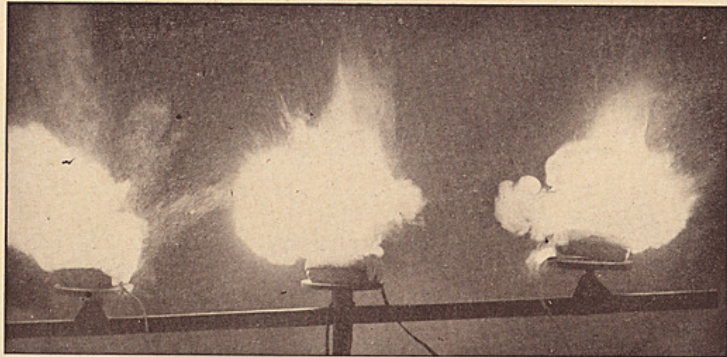
THIS CUT SHOWS THE PRINCIPLE OF THE MULTI-SPEED SHUTTER.

whatsoever. Accompanying each device there is a sheet of simple instructions which will enable any one to achieve success at the first exposure.



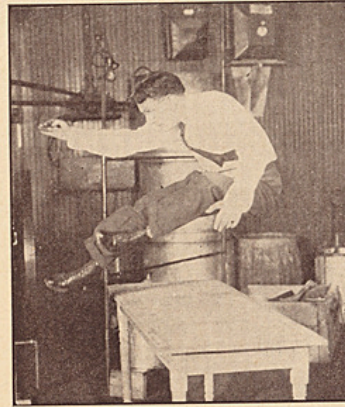
1-1000 SEC. TAKEN WITH FLASHLIGHT, 11 P. M. REDUCED SIZE.
6 FLASHES IGNITED INSTANTANEOUSLY WITH 1½ OUNCES AGFA
POWDER. LUNA PARK, CONEY ISLAND.

We have included in these pages a number of pictures made with this device, and we invite the attention of the reader to the data under each reproduction.

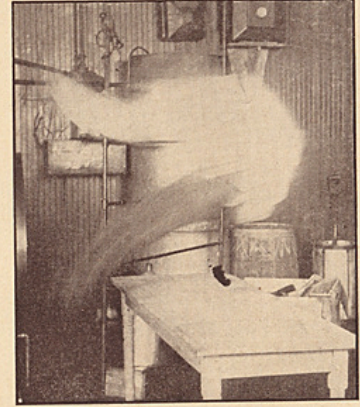


SHOWING THE SIMULTANEOUS IGNITION OF FLASHES.

THE MULTI-SPEED SHUTTER CO.



1-600 SEC. INSTANTANEOUS FLASH-
LIGHT. VICTOR POWDER.
9¼-inch GOERZ LENS.



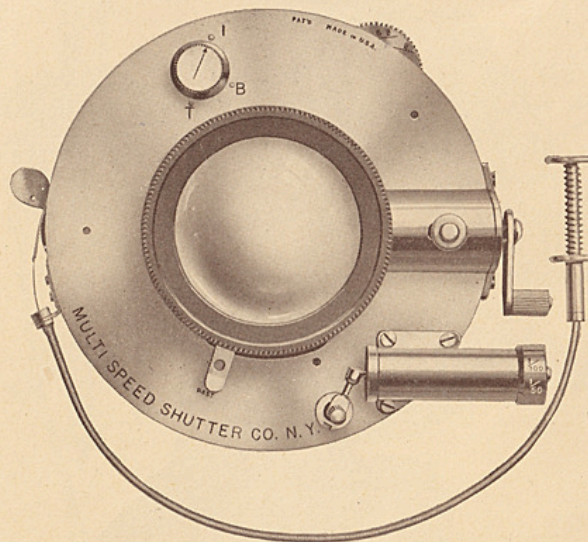
9¼-inch GOERZ LENS STOPPED
DOWN TO F. 32. TAKEN AT THE
SAME TIME. THIS SHOWS THE
DURATION OF FLASH AND HOW
HOPELESS IT IS TO DEPEND ON
FLASH ALONE FOR PICTURE
MOVEMENTS.



7-inch LENS ON MEDIUM SHUTTER, SPECIAL BLADES. REDUCED SIZE.
HITTING HARD FOR A LONG DRIVE. INITIAL SPEED OF BALL ABOUT
300 FEET PER SECOND.
1-4000 SEC. LENS F. 6.8. STANDARD PLATE. 6 P. M. SUMMER.

SPEEDS HIGHER THAN 1-2000 SECOND WITH THE MULTI-SPEED SHUTTER

For those who wish to exceed the ordinary speed of the Multi-Speed Shutters at highest tension (1-2000 second) we can provide special equipment based upon the same well-known blade movement and mechanism of the regular shutters, which will enable the operator to make exposures at speeds up to 1-6000 second.. Please give details with reference to the work you wish to do and we will be glad to give you the benefit of our experience in the field of ultra-speed work and suggest to you the best methods for procuring accurate results.



THE MEDIUM MULTI-SPEED SHUTTER

We recommend the regular Multi-Speed Shutter for all plate and film pack cameras as this style is operated only in one direction (from left to right). It is very quickly reset by pushing over the swinging arm, after an exposure, to the right side of the slot under the lens, and as the spring needs only to be changed or adjusted once to suit prevailing light conditions the operation is simple. The regular Multi-Speed, with the exception of the small automatic shutter, is quickest in resetting and the most reliable in giving the same exposure under all climatic conditions.

For roll film cameras we recommend the Special Regular Shutter. This style is operated in alternate directions, and does not open in resetting.

The Medium Multi-Speed Shutter is designed for 5 x 7, 6½ x 8½, 8 x 10 cameras, 4A Kodaks, etc. Can also be attached to 4 x 5 cameras of Century and Graphic design, but slight alterations are necessary, for which a small charge is made.

Lens mounting from.....\$1.50 to \$2.50

No charge is made for mounting if lenses are ordered with the shutter.

No extra charge is made for attaching the shutter to cameras except as mentioned above. Price of medium shutter.....\$25.00

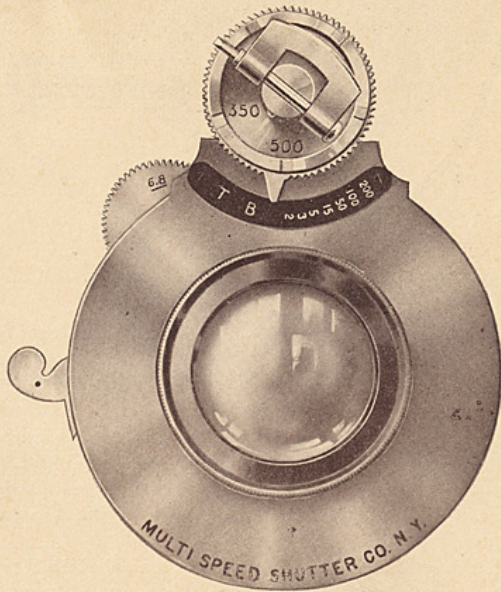
THE MULTI-SPEED SHUTTER CO.

SPECIFICATIONS FOR SMALL MULTI-SPEED SHUTTER

Size: For $3\frac{1}{4} \times 4\frac{1}{4}$, 4×5 , 5×7 cameras; No. 3, 3A and 4 Kodaks and similar instruments.

Price\$23.50
Lens mounting.....\$1.50 to \$2.50

MULTI-SPEED SHUTTER, JUNIOR



Designed for roll film cameras, but just as efficient for plate cameras.

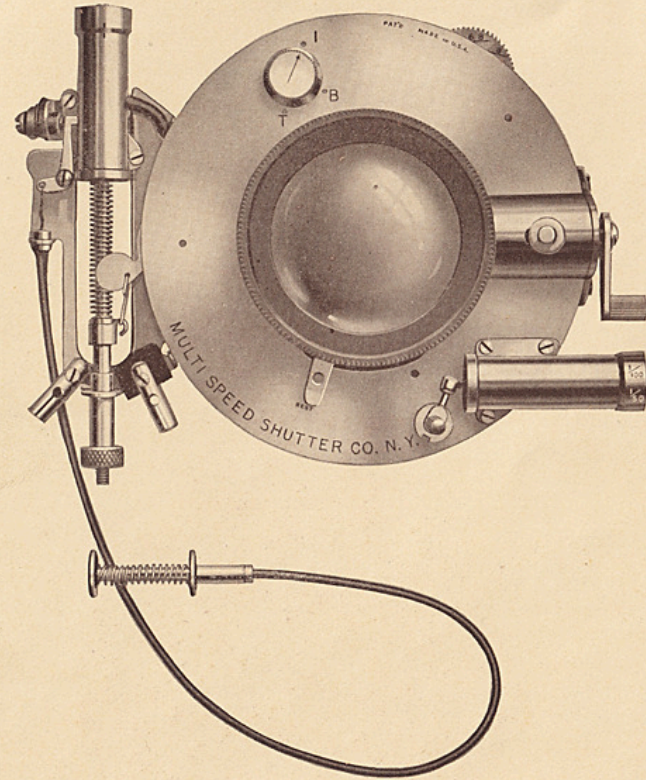
Time, bulb and slow instantaneous exposures from $\frac{1}{2}$ second to 1-200 on lowest tension, 1-350 and 1-500 on the highest tensions.

Price, \$15.00.

Lens mounting, \$1.50.

Special shutters for $6\frac{1}{2}$ inch or $6\frac{7}{8}$ inch lenses (3A Kodaks) ready to receive lenses, \$16.00.

THE MULTI-SPEED SHUTTER CO.



FLASHLIGHT ATTACHMENT

Including 30 feet of flexible wire and three flashlight pans.....\$15.00

Shutter should be sent in to be adjusted.

Electric squibs, price per hundred, \$4.00.

The different Multi-Speed Shutters are designed and built to stand the strains to which such high-speed instruments necessarily must be subjected, and with only ordinary care they will not get out of order. **The shutters are guaranteed for one year**, in which time any defective part (not revealed under the most rigid inspection before delivery) will be replaced without charge.

No charges allowed for old shutters or lenses.

We prefer to have orders placed with Photographic Dealers.

LP 1147