



# *Wollensak* **RAPAX SHUTTER**

This between-the-lens photographic shutter is an extremely precise high-speed instrument which has been built to the exacting tolerances of a fine watch at the Wollensak Optical Company. Only skilled mechanics with many years of experience are permitted to assemble such a fine instrument; with reasonable care it will serve faithfully for many years, by rendering accurate and dependable exposures.

An accurately fitted train of watch gears and pinions, working in connection with a series of levers and carefully tempered springs, assures dependably uniform, properly-timed exposures—the essence of good and well-timed negatives.

In designing the RAPAX Shutter, every consideration was given to the fact that in-

struments of this type are sometimes subjected to continuous and often hard usage.

Nevertheless, the RAPAX is a highly sensitive instrument, and should be handled carefully . . . just as you would any valuable timepiece.

## ★ TO PRE-SET THE SHUTTER

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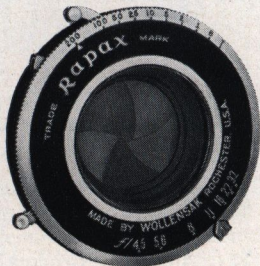
The RAPAX Shutter is a pre-setting type of shutter; before exposure can be made, the shutter must be set. This is accomplished by moving the setting lever, extending from the top of the shutter, *to the right*—the full length of the slot in the dust shield attached to the lever. The shutter is now set, and ready for making the exposure by pressure on the cable release, or by pressing on the release lever located on the left-hand side of the shutter.

## ★ TO OPERATE

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The markings on the speed dial represent the fractional parts of a second, i. e.: T,

Time; B, Bulb; 1, 1 sec.; 2, 1/2 Sec.; 5, 1/5 Sec.; 10, 1/10 Sec.; 25, 1/25 Sec.; 50, 1/50 Sec.; 100, 1/100 Sec., etc.



*The RAPAX Shutter, without built-in synchronization, because of the short, smooth action of the release lever, can be used with any external solenoid or tripper.*

#### FOR TIME EXPOSURES

"T" or *Time Exposure* generally is used when the shutter is to remain open for focusing the lens, or for exposures of long duration. Turn the speed cam (the outside knurled disc) until the letter "T" is at the indicating line on the shutter. Set the shutter with the lever on the top, and release by

pressure on the lever on the left-hand side of the shutter, or by cable release. This action will cause the blades to open and remain open until the release lever is again tripped (in the same direction) when the blades will close.

### **FOR BULB EXPOSURES**

"B" or *Bulb Exposure* is used also for making prolonged exposures. Set the speed indicator to "B" and set the shutter as outlined above; then trip the release lever or press on the cable release, which will open the shutter and remain open as long as pressure is maintained on the lever or cable release. As soon as pressure is released, the shutter will close.

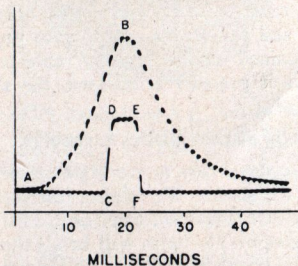
### **FOR INSTANTANEOUS EXPOSURES**

Turn the speed cam to the exposure desired, and set the shutter. To release, just press the cable release or release lever on the left side of the shutter. No harm will befall the shutter if the speed indicator is set between any two given markings, but, for correct exposures, it is more satisfactory to set the indicator accurately at the desired exposure. Speed of the shutter, if used at intermediate settings, is not guaranteed.

# THE RAPAX WITH BUILT-IN SYNCHRONIZATION

Built-in synchronization is a device in the RAPAX Shutter that assures peak illumination of the flash lamp at full shutter opening. A special retarding device delays the opening of the shutter in relation to the time required for the lamp to reach its peak illumination, as illustrated:

## OSCILLOGRAPH OF FLASH BULB AND SHUTTER CHARACTERISTICS



*ALL RAPAX Shutter speeds and the delayed action of the synchronizer and the duration of contacts are checked in milliseconds on the GE Time-Interval Meter.*

*The quality of the electrical contacts in the synchronizer is checked on the cathode-ray oscilloscope for accuracy.*

The outside curve represents characteristics of a GE 11 Flash Lamp.

The inside curve represents shutter characteristic coincidence of peak points to perfect synchronization.

"A"—point of contact, lamp begins to light and reaches maximum or peak illumination at "B." At "C," shutter starts to open, remains fully open from "D" to "E" and closes at "F." This illustration represents 1/200 second exposure with synchronization at 20 milliseconds. At slower speeds the distance between "D" and "E" becomes longer, although peak illumination "B" remains unchanged.

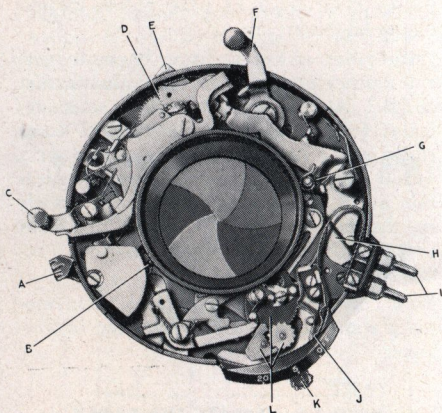
Both curves were photographed simultaneously with the aid of a cathode-ray oscilloscope.

### **★ HOW TO OPERATE THE RAPAX WITH BUILT-IN SYNCHRONIZATION**

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Fasten the rectangular end of electrical connecting cord to the contacts, Part (1), projecting from the lower right-hand side of the shutter, and the other end of the series outlet in the battery case.

# INSIDE CONSTRUCTION OF THE RAPAX SHUTTER



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|--------------------------------|--------------------------------|
| <i>A Diaphragm indicator</i>   | <i>H Main lever</i>            |
| <i>B Blade arrestor</i>        | <i>I Outside contact posts</i> |
| <i>C Release lever</i>         | <i>J Point of contact</i>      |
| <i>D Retarding device</i>      | <i>K Time-delay indicator</i>  |
| <i>E Cable release bearing</i> | <i>L Retarding mechanism</i>   |
| <i>F Setting lever</i>         | <i>for synchronization of</i>  |
| <i>G High-speed spring</i>     | <i>various flash lamps</i>     |

The shutter is hand-tripped or released, and automatically synchronizes the peak flash of the lamp with the maximum shutter opening. Built-in synchronization eliminates the need of external synchronizers or solenoids. *The only battery current needed is to flash the lamp.*

After selecting the flash lamp to be used, set the time-delay indicator "K" to the letter "M," "F," or "X" engraved on the scale. These letters have been adopted by the American Standards Association to denote different flash lamp classifications. Setting the indicator to "M" sets the shutter for proper synchronization with Class M (Medium Peak) lamps such as Wabash 0, 2, Press 25, 40, 50, and GE 22, 11, and 5. The "F" setting provides for synchronization with Class F (Fast Peak) lamps such as the SM and SF lamps. When no time-delay is required as in the use of the Kodatron speedlamp and similar ultra-speed lamps, the indicator should be set to "X."

The letters "M," "F," and "X" correspond respectively to the numbers "20," "5," and "0" on the earlier model of the Rapax Synchronized Shutter.

No other adjustment is necessary, except to

cock the shutter and see that the flash lamp is inserted in the battery case.

After the shutter is set for synchronization, simply set or cock the shutter by moving the setting lever at the top of the shutter. You are now ready to make the exposure.

*CAUTION:* The time-delay indicator should be set to the desired position before setting the shutter; if the shutter is already cocked before moving the millisecond indicator from OFF position to any other position, the synchronization mechanism will not be cocked. In such cases, simply re-cock the shutter.

Should the shutter be cocked with the lamp in place, the time-delay indicator may be moved from F to M or M to F but not to the OFF position. If it is moved to an OFF position with the shutter cocked and the lamp in place, the lamp will flash. To make this change in setting, simply remove the lamp from the battery case and then set time-delay indicator to the desired position. If the time-delay lever is at a given setting, it does not require re-setting after each exposure as long as the same type of flash lamp is used.

With the time-delay indicator in the OFF

position, *no electrical contacts are made.*

The shutter speeds may be re-set at any time after the shutter is cocked without firing the lamp.

It is recommended that if more than one flash lamp is used, additional batteries should be used.

Using standard 1.5 volt flashlight cells, the wiring for extension flash lamps using No. 18 or larger are:

3 cells	15 ft. wire	2 lamps max.
4 cells	25 ft. wire	2 lamps max.
5 cells	50 ft. wire	2 to 3 lamps max.
6 cells	75 ft. wire	2 to 3 lamps max.

## ★ DON'T

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*DON'T* use oil on the shutter. Special greases have been applied, making it unnecessary to use any additional lubricants.

*Oil will ruin the shutter.*

*DON'T* use graphite. If the shutter seems sluggish, it may be the result of continuous wear, extreme atmospheric conditions, or undue exposure to dust. Should dust settle on the mechanism, use a soft camel hair brush to remove same, or blow the dust off with a rubber syringe bulb.

## ★ GUARANTEE

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This shutter is warranted to give perfect satisfaction. If any Wollensak product, with proper care, fails to give satisfaction within one year after leaving our factory, repair or replacement will be made free of charge.



**WOLLENSAK**  
**ROCHESTER 5, N.Y., U.S.A.**