second vice-president, C. J. Kelloway, signal engineer, Atlantic Coast Line, Wilmington, N. C.; secretary-treasurer, C. C. Rosenberg, Bethlehem, Pa.; directors for two years, E. G. Stradling, signal engineer, Chicago, Indianapolis & Louisville, Lafayette, Ind., A. P. Hix, signal engineer, Terminal Railroad Association of St. Louis, St. Louis, Mo., J. H. Cormick, signal engineer, Canadian Northern, Winnipeg, Man., and A. H. Rice, signal engineer, Delaware & Hudson, Albany, N. Y.; members of the nominating committee, G. K. Thomas, assistant signal engineer, Atchison, Topeka & Santa Fe, Topeka, Kan., C. G. McCauley, supervisor of signals, Washington Terminal Company, Washington, D. C., H. W. Chevalier, draftsman, signal department, Chicago, Milwaukee & St. Paul, Milwaukee Shops, Wis., and H. E. Johnson, signal foreman, Toledo & Ohio Central, Columbus, Ohio.

Just before President-elect Elliott accepted the gavel from President Dunham, he presented the latter with a desk clock on behalf of the members of the Association as a token of personal esteem and recognition of his active service in the presidency. After President Dunham had replied briefly to the presentation speech, he inducted the new president into office, who accepted in a short talk. He referred to the fact that in 1898, as vice-president, he had performed the function of president through unfortunate circumstances, and that the Association had grown in membership from 28 to 1,281 in the intervening period.

The convention then adjourned.

The Use of Photography in Signaling

First Article of a Series to Show Those with Little or No Experienc How to Make Pictures of Value

By C. G. Stecher,
Sig. Inst., C. & N. W., Chicago

THE camera is not usually looked upon by signalmen as an instrument of utility, but is assumed to be useful only for pleasure. However, it is recognized by a few signalmen individually and by at least one signal department officially as a convenient and quick means to obtain accurate, permanent records of signals, signal accessories, buildings, construction methods, etc. It must be conceded by every one who has given the matter any consideration that a good photograph may serve the purpose as well or better than a drawing or lengthy description, or both, of some apparatus or some construction or maintenance method.

In addition to these practical, or, one might say, business considerations, a good deal of pleasure can be derived from the judicious use of a camera. Pictures can be taken of signals, interesting maintenance or construction methods, of friends and fellow-workmen, and many enjoyable moments can be spent during later years in going over a collection of pictures of signals and apparatus perhaps then out of date, of old-fashioned ways of doing work, of old-time friends and acquaintances, all of which might otherwise have been lost to memory. It should be understood that pictures can be taken throughout the year, in winter or summer, in sunshine or cloudy weather.

Many signalmen in past years have undoubtedly followed the advice: "You press the button and we do the rest." They have purchased a camera of some sort, pressed the button at haphazard, and perhaps altogether too frequently, and then found that the results of the rest were often far from satisfactory. The poor results obtained by some amateurs has deterred many others from trying their "luck. But there is no such thing in photography as "luck." It all depends on "knowing how" and on SYSTEM, spelled with capital letters. This is particularly true if one does his own developing and printing. It must not be assumed, however, that photography as it can be practiced by the amateur is difficult to learn. The necessary principles can be mastered easily by anyone with ordinary intelligence. Poor results are nearly always due to the fact that some of the simplest fundamental principles have been violated and this is frequently through thoughtlessness or carelessness. In order to assist the beginner or amateur, this and the articles which are to follow were written by one of the fraternity (not of photographers but of signalmen) who has traveled the rocky road of the beginner, but who has made it a practice always to try to find the reason for poor results.

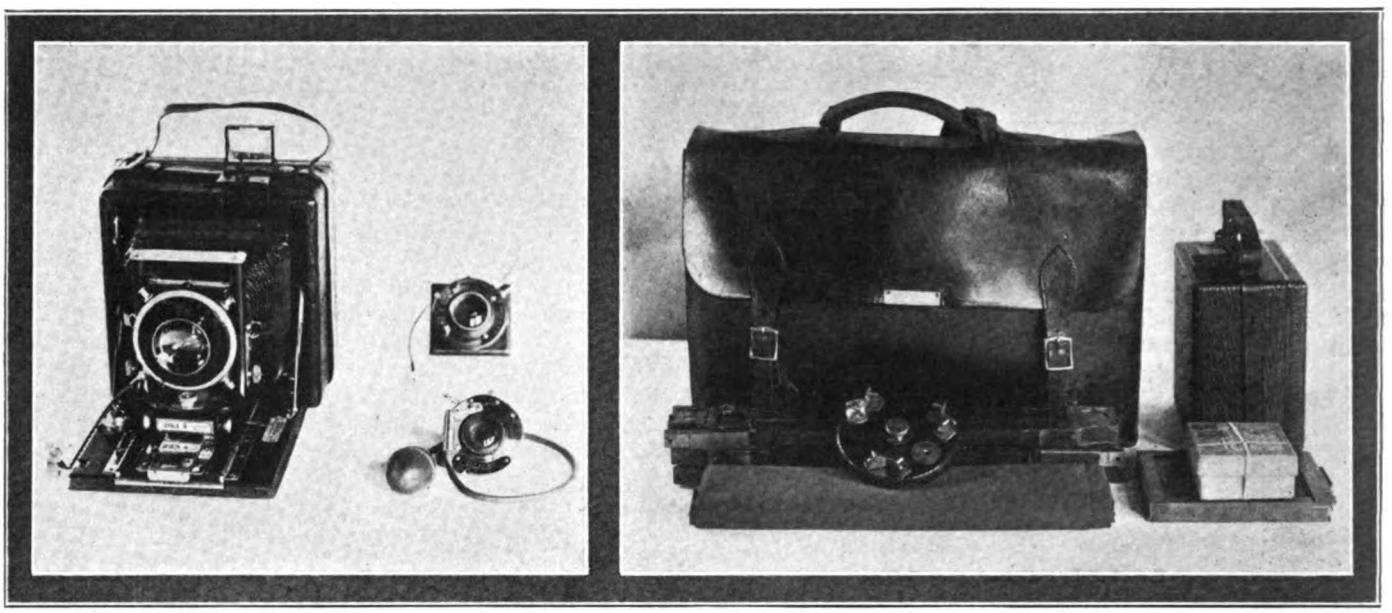
The first question which naturally arises is: What sort of camera should I have? This depends largely on whether the first desideratum is compactness, in other words, ease in carrying, or whether it is the quality of work to be done with the camera. Various types and makes of cameras are on the market, enough to suit the convenience, taste or pocketbook of almost everyone. Pictures are taken on film, either in rolls or in packs, and on glass plates known as dry plates, and cameras are made accordingly. Equally good results can be obtained with films and plates, but it is true that many photographers and advanced amateurs prefer plates, particularly for accurate work, for reasons which will be brought out later. The most compact cameras, and consequently the easiest to carry, are the ones in which roll film is used. The smaller sizes can readily be carried in the coat pocket and as they can be loaded and unloaded by daylight, a dark-room is not necessary. Films sufficient for a large number of exposures can be carried in the pocket or grip. Furthermore, the exposed films can be developed by the amateur by means of a tank made for the purpose and without the necessity for using a dark-room.

The disadvantages of this type of camera are, first, there is no ground glass to show whether the lens is properly set for distance; consequently there can be no accurate focusing. A focusing scale is provided and the lens is set at the figure on the scale which corresponds with the *estimated* distance from the camera of the subject to be photographed. The view-finder which is provided shows only the amount of the view covered by the lens and not whether the picture will be sharp or blurred.

There are cameras of the cheaper grades and the smallest sizes on which the lens is set at a fixed distance from the film; as a result, no adjustment or focusing is required, but these should not be considered by the man who really wants pictures. Another disadvantage of the roll film camera is that the film is on spools containing six, ten or twelve exposures. After a new spool has been inserted the entire number of exposures on the spool must be made before any can be developed. It is therefore out of the question to make one or two exposures,

develop them and obtain pictures from them at once unless a great deal of film is wasted.

From the foregoing one may come to the conclusion that if pictures are to be taken which will show detail such as of signal apparatus, construction and maintenance methods, etc., and if good results are to be assured whenever an exposure is made, a camera with a ground glass, known as a folding box camera, should be selected. The *only* practical objection to this type of camera is that it is more bulky and consequently not as convenient to carry as the roll film camera. There are, however, several makes of this type on the market which are very compact considering their adaptability. If pictures of high buildings or even of interlocking towers or high junction poles are to be taken at close quarters and the roof or top is to be included in the picture the camera should be provided with a rising and falling front, and if at all practical, also with a swing back. A revolving back is also to be preferred to the separable back. The use of these conveniences will be explained later.



A 4 by 5 Folding Box Camera With Two Extra Lenses and Carrying Case With Complete Equipment

Films or glass plates can be used in these cameras. As already stated many professionals and advanced amateurs prefer to use plates because they are more easily handled during development and printing; after a plate has been exposed it can be developed and made ready for printing at once without trouble or extra work; further, the cost of plates is much less than that of films, either in the roll or pack. This is an item which should not be overlooked if many pictures are to be taken. On the other hand, it is, of course, somewhat inconvenient to carry a large number of plates in a grip or tool-bag.

By using an adapter, instead of a plate-holder, film packs can be used, each pack containing twelve films. The advantage of the film-pack over the roll-film is that after one or more of the films in the pack have been exposed, the pack can be taken to the dark-room, the exposed films extracted and developed, the pack resealed and again inserted in the adapter and the balance exposed at any time. Focusing can be done before each exposure, whether using plates or film-pack, as the adapter is provided with a slide which is inserted after an exposure has been made and the adapter can then be removed from the camera. Film-packs can be inserted in the adapter and therefore in the camera by daylight, but glass plates can be loaded into the plate holders only in a dark-room or closet from which all light can be excluded. A tank can be used to develop film packs and plates, but a dark-room is necessary when the films or plates are placed in the tank.

Folding box cameras are provided with a view-finder and a focusing scale, so that snapshots can be made with them fully as well as with the roll-film cameras, a fact which is usually not understood by the prospective owner of a camera.

Two other types of camera might be mentioned, namely, the view camera and the reflecting type of camera, known as the graflex and reflex. However, they are very seldom used by the beginner, the first mentioned because of its great bulk and the fact that it can be used only on a tripod; the second, also partly on account of its bulk, but principally because of its exceedingly high cost.

The next consideration is the size of the picture to be taken by the camera. Here again we are up against bulk and convenience in carrying. The larger the picture, the bigger the camera; in fact, the camera increases in bulk in a somewhat greater ratio than the size of the picture.

Next comes the work to be done. If detail is to be shown without going to the trouble of making enlargements the picture must be of fairly good size. A size used a great deal by beginners is the 2¼ in. x 3¼ in., but the picture is so small that it is of little or no value as a record or to bring out detail of apparatus or methods. A good and undoubtedly the most convenient size for the purpose just mentioned is the 4 in. x 5 in. Another good size is the 3¼ in. x 5½ in., known as the post card size. Above the sizes mentioned the camera becomes very inconvenient to carry and expensive to use.

Last, but not least by any means, in the consideration of size of camera comes the size of the pocketbook, or, rather, the contents of it, which is usually not excessive among signalmen. Cost may therefore be largely the determining factor of size. Not only is the cost of the larger camera much greater, but the cost of the materials, such as films, dry plates, paper, etc., is very much more than for the smaller sizes. Consequently every time a picture is taken and made with the larger camera, the

cost is greater than if a smaller one had been used. This fact is overlooked by many when purchasing a camera and it is later left lying on a shelf because the making of the larger pictures is considered too costly.

If you would learn by experience the truth of the axiom: "It isn't the original cost, it's the upkeep—fr' instance—a camera," buy a large size camera with a low-grade, low-priced lens. One is tempted to say cheap lens, but a *low*-priced lens soon becomes an exceedingly expensive one in the hands of the beginner, because the limitations of the lens are usually not understood by him and the results are frequent under-exposures—spoiled materials or poor pictures, disappointments and discouragement. It cannot be emphasized too strongly that if a camera with a good lens for a large picture is too expensive for the pocketbook, purchase a smaller one with a good lens.

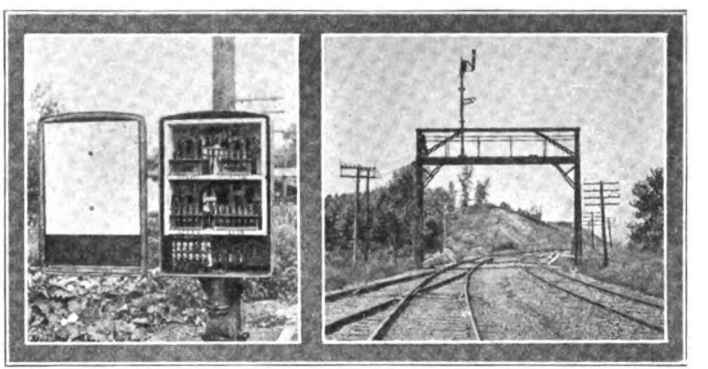
No attempt will be made to go into detailed or technical descriptions of the various grades of lenses, as it is not at all necessary for the purpose of these articles or for the beginner. Lenses can be divided into single lenses—meniscus—and double lenses, the rectilinear and anastigmat. The double lenses are really two lenses matched to be used together to increase the quality and "speed," the two parts usually being called the front and rear combination. In some cases these can be used separately, provided the camera is fitted with a bellows long enough for the purpose. Each combination is usually of different focal length; that is, it has to be set at a different distance from the film or plate in order to obtain a clear picture. They are used separately for copying and to take pictures of subjects at some distance so that a larger image will be obtained than if the complete lens had been used. For snapshots the lens must be used complete. Such lenses are known as three-focus lenses. The single lenses are the cheapest on the market, and although good results can be obtained by their use if conditions are right, they have their limitations to such an extent that they should not be considered by the man who *wants* pictures.

Lenses are rated as to their speed and quality. Two systems of numbers are used, the f system and the U. S. system. The corresponding values of the two systems are:

U. S. 1. = f 4.	U. S. 8. = f 11.
U. S. 2. = f 5.6.	U. S. 16. = f 16.
U. S. 4. = f 8.	

The single lenses are rated as U. S. (or f) 16; the rectilinear usually as U. S. 4 or f 8. and the anastigmats as f 7.7, 7.5, 6.8, 6.3, 6., 5.6 and 4.5. As the figures *decrease*, the diameter, quality and speed of the lens *increases*, and naturally and rapidly, the price increases. While the above in regard to rating or numbering of lenses may appear complicated and meaningless to the beginner, in practice as the amateur needs to know it, it amounts to about this: Assuming that light conditions are such that with a lens U. S. 4 or f 8, wide open, an exposure of ½ second is required, then with a 5.6 lens wide open ¼ second would be correct and with a 4.5 lens only about ⅛ second would be required. Working the other way, a U. S. 8 lens would require 1 second and with a U. S. 16 (single lens) fully 2 seconds would be necessary. It is assumed by many that a "fast" lens is intended only to take pictures of rapidly moving objects, such as trains or at races, but it is of advantage much more frequently to take snapshots when the light is somewhat poor. It can be readily understood by anyone after considering the above in regard to lenses, that if the light conditions are just right to take a snapshot with a U. S. 4 lens wide open, it would be a failure to attempt it with a single lens—U. S. 16. Further, it must not be overlooked that better pictures can be obtained by the use of a high-grade lens, although all other conditions are the same.

To make the exposure, a shutter of some sort is necessary. Many different types and grades are on the market, so constructed that snapshots and time exposures can be made. The cheaper grades usually have three letters at the top—T, B and I—T for time exposures of any length, B for short time exposures and I for instantaneous exposures. However, a better shutter than the above described should be selected. One which will operate on T, B, 1/100, 1/50, 1/25, 1/5, ½ and 1 second with a U. S. 4 or better lens will be found very convenient for all-around work and shutters of this grade are quite low in price. A higher speed than 1/100 of a second is of advantage only with a lens faster than f 7.5 and only during good light conditions; that is, bright sunshine. When selecting a lens and shutter do not be deceived by the statement that "this shutter will take a picture at 1/200 or 1/300 part of a second, because it will not do so, although it will operate at such speeds, unless a very fast lens is used with it. Good all-around work can be done with a U. S. 4 rectilinear lens, but of course better work can be done with an anastigmat lens and snapshots made with a fast one when it could not be done with the first mentioned on account of the light not being bright enough.



Two Views Made by 4 by 5 Camera (Reduced One-half)

After carefully considering all of the foregoing points one should be able to select a camera which will be satisfactory when it is put to actual use. It may be of interest to know that the author has used cameras of nearly all types and grades and is now using most extensively a 4-in. x 5-in. folding box camera with long bellows, rising and falling front, revolving and swing back. Three lenses are used with it, an f 4.5 anastigmat, a U. S. 4 three-focus rectilinear and an f 12 wide angle lens, each lens in its shutter and on separate lens-board. The wide-angle lens is used for taking interior views. The writer also uses a carrying case, 16 in. long x 5 in. wide and 11 in. deep. This holds the camera, a box containing extra lenses, a film pack adapter, the tripod with head and a focusing cloth, all shown in the illustration, and in addition six to eight 4-in. x 5-in. plate-holders, two or three notebooks and a magazine or blue-prints rolled or folded not to exceed 16 in. in length.

THE NEW YORK CENTRAL has temporarily suspended the rule under which all employees reaching the age of 70 years are to be retired on pension. Former employees, now retired on pension, who are physically able and competent to perform some work, will be re-employed temporarily, if they so desire.