July 12, 1932. E. A. SUTCLIFFE 1,866,866

ART OF PHOTOGRAPHY

Filed May 16, 1930

Fig. 1

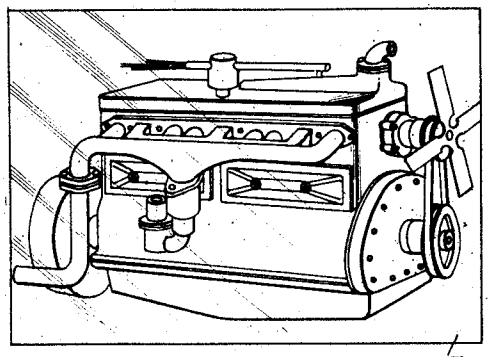


Fig. 2

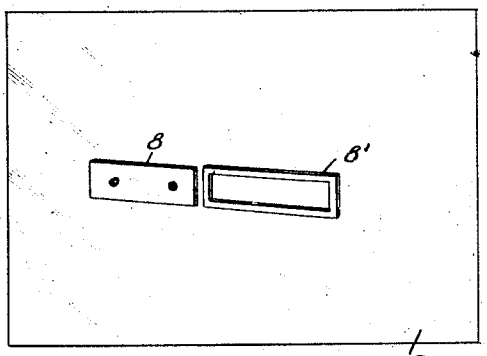


Fig. 3

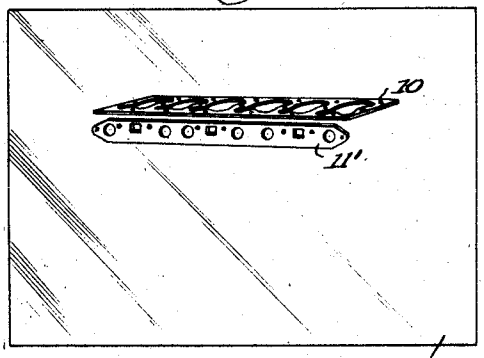


Fig. 4

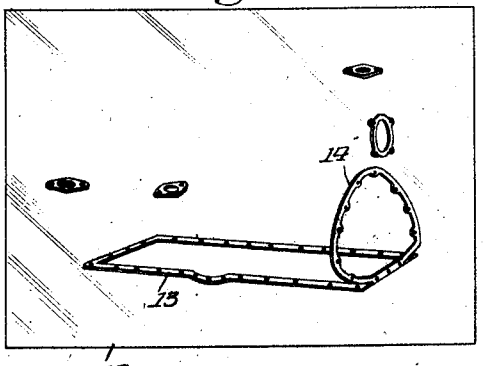


Fig. 5

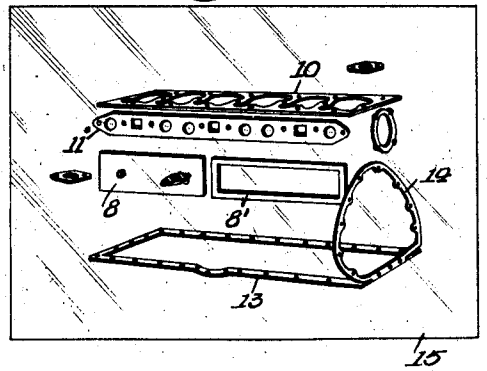
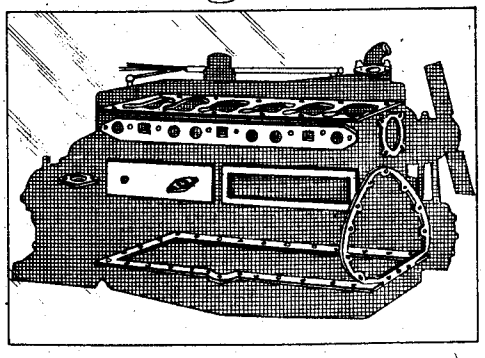


Fig. 6



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Patented July 12, 1932 1,866,866

UNITED STATES PATENT OFFICE

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ART OF PHOTOGRAPHY

Application filed May 16, 1930. Serial No. 452,916.

This invention relates to improvements in photography and it has for its object to enable shadow or phantom pictures to be made in a practical and economical manner to assist in the production of cuts for advertising and other purposes, and particularly to enable certain parts of an object to be shown in strong contrast with but in proper position in or on the object.

Since it will be convenient to refer to a specific use of the invention in explaining the objects and art of practicing the invention I have selected for this purpose making a picture of gaskets used in connection with an internal combustion engine.

It is common practice to provide a number of gaskets differing in size, shape and construction for the joints in and on the block and head of an internal combustion engine, the number and size and sometimes the construction of these gaskets being determined generally by the design of the engine. For the information of purchasers of gaskets and particularly those who are unfamiliar with them, and to enable a purchaser to readily determine and identify a particular gasket which he requires, it has been found desirable to illustrate the complete engine in perspective in a shadow picture with the gaskets displayed thereon, and in strong contrast therewith, in the position with relation to the engine and to each other as they occupy in actual use. This provides instructive information to the particular art and to the public generally. It also enables a purchaser to quickly identify the gasket he requires, because he knows where he wishes to install the new gasket and he can easily pick out the gasket on the picture by reference to its location and to its own particular characteristics. It has been customary heretofore to identify gaskets by numbers, symbols, cuts and names and all are customarily used to some extent in a transaction involving the purchase of a gasket. The customer may know the name of the gasket, which generally has some reference to its location, and if he does not know the name he may recognize the gasket by the cut; many gaskets closely resemble each other in cuts and selection in this way is often difficult and impossible to some. The number and symbol are associated with the name on the gasket. So that, if a customer can identify a gasket by name or by cut it is possible by reference to the number and symbol to select the proper gasket. This involves a great deal of uncertainty, possible annoyance to the purchaser and seller, loss of time, and expense. It is the desire of the basket manufacturer to facilitate sales of his product in every way and as much as possible and one way of accomplishing this is to make it easy for a customer to know and to identify the gasket he wants. There is no easier way for accomplishing this than by a visual selection of the gasket in the position which it occupies in the engine, whereupon the proper identifying data may be easily obtained. The owner of an engine or his mechanic may know a cylinder-head gasket, an exhaust manifold gasket and an intake manifold gasket by name, or he may be able to describe them so clearly that a dealer will have no difficulty in supplying him with the proper gasket; but it is not every owner or mechanic who knows these names, or who is capable of describing the gaskets so clearly that mistakes will not be made, and there are many gaskets which he could not name and some which have such unusual names that they are not even familiar to the majority of workers in the engine art. For example, there are several riser gaskets and several water manifold gaskets differing in structural details and located in different positions and presenting obvious opportunities for mistake in purchasing proper replacements. When the engine is installed in a motor vehicle it is possible sometimes to drive the vehicle to the gasket dealer so that the purchaser may point out to the dealer the gasket which needs replacement, but this is not always practicable and it often involves unnecessary waste of time and money. It has only been possible heretofore to make a picture showing gaskets at their joints in an engine by free-hand drawings, sometimes assisted to a limited extent by photographs. This is a slow, laborious and costly method, it lacks the realistic impression of good pho-

tography and it is not always satisfactory in execution; hence it is seldom used.

My invention enables a picture to be made easily and accurately for displaying in perspective the gaskets of an engine in their position at the joints of the engine upon a shadow or outline picture of the engine and preferably in strong contrast therewith so that by reason of their location and their general size, shape and other characteristics they can be easily and correctly identified by anyone seeking to obtain replacement gaskets.

Another object of the invention is to enable a picture to be made entirely by photography, and in a simple and inexpensive manner, for showing certain parts, which are used in assembly with other parts, in their proper assembled relation to the other parts and in their proper shape and proportionate size, but in strong contrast with the other parts, so that they may be observed in strong relief, so to speak, with the other parts in shadow and all arranged in their proper assembled relation.

I have referred to the use of my invention for showing gaskets in an internal combustion engine and from this it will be obvious, especially to those skilled in the photographic art, that the invention may be employed and adapted for a great many uses which it is not necessary to refer to specifically. I wish to be understood that reference to engine gaskets herein is for explanation only and that it will be interpreted broadly to include objects of any kind. But since an engine gasket is a good illustration of a practical use of the invention I will continue to refer to it for convenience in explaining the invention and in the accompanying drawing I have illustrated diagrammatically the way the invention would be practiced in preparing a picture illustrating a plurality of gaskets upon an internal combustion engine and in strong contrast therewith, and referring thereto,

Fig. 1 illustrates an image of an engine on a ground-glass substitute plate;

Fig. 2 illustrates a positive showing two valve spring cover gaskets;

Fig. 3 is a similar view showing cylinder head and manifold gaskets;

Fig. 4 is a similar view showing two other gaskets;

Fig. 5 is a composite positive of all of the gaskets shown in the preceding figures; and

Fig. 6 is the completed picture showing the engine in shadow with the gaskets in strong contrast therewith and arranged thereon in their proper positions at the joints in the engine.

In practicing my invention I proceed substantially as follows:—First I take a photograph negative of the engine on a sensitized plate 7. This negative is made of suitable size to fit into the ground-glass plate holder of the camera and it is used for finding purposes, being treated in a suitable manner so that it is capable of receiving and retaining a light image coming through the camera. The negative may be made in a known way by using a standard sensitized plate, developing and drying the plate, coating the negative with a solution of potassium permanganate to reduce the opaqueness of the image and to provide a desired degree of transparency, and then setting and protecting the negative with a flow emulsion of a suitable ground-glass substitute to thus produce the equivalent of the usual ground-glass plate. Any desired variations of this method or any other suitable method may be employed so long as there is produced a photograph negative sufficiently clear and transparent to be used for finding purposes in the manner hereafter described. The ground-glass negative, so produced, is placed in the camera and used as a finder to determine the size of and to focus the images of the two valve spring cover gaskets 8, 8′, Fig. 2, and to locate the images in the position which they occupy in the joints on the engine, said gaskets being posed in a proper position apart from the engine, and after being properly posed a negative is made in the usual photographic manner from which the positive gasket print 9 is made. This posing of the gaskets may be done by measuring the distance between the gasket and locating points when the gasket is in the engine during the time the ground-glass finder plate is being made. With these dimensions the gasket may be posed accurately in its normal position when the negative for the print 9 is being made. In focusing the gasket to proper size and position its outer contours should be registered with the contours of the joint as it appears on the ground-glass negative, and the bolt holes should be suitably centered on the bolts which appear in the ground-glass negative. Then in a similar manner, I make a gasket print 10 of the cylinder head gasket 11 and a gasket print 12 of the oil pan gasket 13 and the cam shaft timing gear housing gasket 14. It may be necessary at times to make a separate gasket print of each gasket but wherever it is possible to do so I prefer to include more than one gasket in each positive to reduce the number of gasket prints and the labor involved. A combination gasket print is shown in Fig. 3 wherein the manifold gasket 11′ is shown with the cylinder head gasket 11. The gasket print 12, Fig. 4, is also a combination one, wherein water, exhaust, and intake gaskets are shown with the gaskets 13 and 14. Whether or not combination gasket prints like 10 and 12 in Figs. 2 and 4 may be made will depend primarily upon the nature of the work and I have indicated it in these two figures to show the possibility of reducing the number of operations.

I have now described the making of three gasket prints, 9, 10 and 12, and it will be understood that this procedure is followed in making as many gasket prints as the work may require. As a matter of fact, it would be necessary to make several additional gasket prints to show all of the gaskets commonly used in an engine. In this connection it may be observed that this illustrates one of the important advantages of my invention for the difficulty involved in making drawings, free-hand or otherwise, of gaskets will vary with the size, shape and arrangement of the gasket, and the more gaskets to be shown the more difficult the work becomes and the greater amount of work involved; but to make gasket prints is a very simple procedure and it is no more difficult to make one gasket print than another and making a plurality of gasket prints is merely duplicating the work. I then make a composite gasket print 15, Fig. 5, from Figs. 2, 3 and 4, showing all of the gaskets in their proper relation to each other and each in the position which it would occupy in the assembled engine as viewed through the ground-glass negative and this may be done by making a photographic print of the complete engine and then superimposing the gasket positives or prints one at a time upon the engine print. If the prints are all of exactly the same size each gasket would be located, if it could be seen through the print, upon the engine of the engine print in proper position as it is located on the engine itself.

I make pin or other registration marks on the gasket and engine prints and cut away the background of the gasket print and then fasten the gasket print cut-out on the engine print, using the pin marks for registering the gasket print in its proper position on the engine print. The gasket print cut-out is affixed to the engine print by adhesive or other suitable means. I may omit cutting out that portion of the background of the print enclosed within the gasket, or within an opening in the gasket, and paint this enclosed portion black. Where one gasket is located in front of another I may cut out the enclosed portion of the front gasket print to permit the back gasket to show therethrough; or I may omit cutting out the enclosed portion of the front gasket print and cut out that portion of the back gasket which should show through the front gasket print and paste it on the enclosed portion of the front gasket print; or I may draw in some of the detail that should show through the front gasket print, instead of cutting out the enclosed portion of the front gasket print, if this is an easier way of accomplishing the desired result. It may be stated here that one of the principal objects of my invention is to substitute photography for drawing wherever it is possible to do so, but I apprehend that in some instances it may be quicker and easier to show some detail by drawing than to resort to photography and in such case I would proceed accordingly. When all of the gasket prints have been cut out and built up on the engine print in their proper position as they are located on the engine itself, and suitably affixed on the engine print, it may be necessary to retouch the gasket pictures to bring them out sharp and strong in accordance with the usual practice in the photographic art. Also the engine picture may be filled in in contrasting tone to the gasket pictures to form a background therefor, as shown in Fig. 6. If desired, the engine may be merely shown in outline. In either case there is produced, as a subject for final photographing, the representation of an engine with some or all of its gaskets displayed thereon in the positions which they occupy in the joints of the engine. If the engine is indicated in outline only and the gaskets are dark there will be the desired contrast between the gaskets and the engine; I have found it effective to show the gaskets light and the engine filled in in black or in shadow. Instead of building up the composite gasket print, as a subject for final photographing, by cutting out each gasket print and mounting the cut-out gaskets in their proper position upon an engine print, the gasket cut-outs may be assembled upon some other base than an engine print, and in proper relation, and a composite negative made therefrom which may be superposed by photography upon a negative of the engine to obtain the result heretofore described; or the separate gasket cut-outs may be double-printed on the engine negative in proper superimposed order and registration, after which a photographic print may be made from the composite negative.

My invention provides a simple and easy method of preparing a shadow picture, for example, of an automotive engine with all of its gaskets shown clearly and distinctly in contrasting tone or color in their proper position in the joints of the engine so far as the same can be seen from any focal point and, while I have disclosed the invention by reference to an automobile engine and its gaskets as a striking illustration of the utility of the invention, it should be understood that the scope of the invention is not limited thereby because I believe it will be apparent from this illustration that the invention has a wide range of usefulness. As hereinbefore indicated the primary object of the invention is to eliminate so far as possible the necessity of resorting to free-hand drawing in the production of shadow pictures to illustrate component parts of the object and to enable this to be done according to the art of photography. The completed picture is important for its educational value as well as for its

commercial value; in the case of an automotive engine it quickly gives to the student or apprentice, to the mechanic and others, a complete disclosure of the joints of an engine and the gaskets required for these joints, and imparts a conception of the interior skeleton, so to speak, of the engine. This may be more important in other illustrations of the use of my invention, for example, where hidden working parts are disclosed. It is difficult and costly to do work of this kind by drawing; and often it is impossible to combine the accuracy of mechanical drawing with the artistry of free-hand drawing sufficiently to produce that naturalness in representation which is common in photography. My invention reproduces with accuracy all of the visible characteristics of the component parts of the article desired to be shown, in their proper and relative sizes and shapes, wholly by means employed in the art of photography.

While I have indicated the method to be followed in practicing my invention in a selected illustration, with sufficient particularity to enable anyone skilled in the art to successfully use the invention, it may be necessary or desirable to vary the details from time to time and to meet different conditions in practicing the invention on other objects and I wish it to be understood that I reserve the right to make any and all such changes or modifications within the scope of the following claims:

I claim:

1. The improvement in the art of photography which consists in preparing a ground-glass negative of an object and arranging the negative in the usual position of a ground-glass in a camera; posing a part of the object and using the ground-glass negative as a finder whereby an image of the part may be made to appear in its proper position on the negative, and making a negative of said posed part; repeating the posing of the parts and the making of negatives thereof as often as required for showing as many parts of the object as are desired to be shown; preparing an object print from the ground-glass negative and part prints from the part negatives; making part cut-outs from the part prints and assembling the same in their proper position upon the object print; and making a photographic negative of the assembly.

2. The improvement in the art of photography which consists in preparing a ground-glass negative of an object and arranging the negative in the usual position of a ground glass in a camera; posing a part of the object and using the ground-glass negative as a finder whereby an image of the part may be made to appear in its proper position on the negative, and making a negative of said posed part; repeating the posing of the parts and the making of negatives thereof as often as required for showing as many parts of the object as are desired to be shown; preparing an object print from the ground-glass negative and painting the picture of the object thereon to a uniform shade; making part prints from the part negatives; making part cut-outs from the part prints and assembling the same in their proper position upon the object print; and making a photographic negative of the assembly.

3. The improvement in the art of photography which consists in preparing a ground-glass on the negative of an object and arranging the negative in the usual position of a ground-glass in a camera; posing a part of the object and using the ground-glass neative as a finder whereby an image of the part may be made to appear in its proper position on the negative, and making a negative of said posed part; repeating the posing of the parts and the making of negatives thereof as often as required for showing as many parts of the object as are desired to be shown; preparing an object print from the ground-glass negative and painting the picture of the object thereon to a uniform shade; making part prints from the part negatives; providing registration marks for all of said prints; providing registration marks of the picture of each part upon the object print; making part cut-outs from the part prints and assembling the same according to their registration marks upon the object print; and making a photographic negative of the assembly.

EDWIN A. SUTCLIFFE.