

Folmer - Graflex

NATIONAL GRAFLEX

REPAIR MANUAL

FOLMER GRAFLEX CORPORATION

ROCHESTER, NEW YORK

NATIONAL GRAFLEX
REPAIR MANUAL

INTRODUCTION

The National Graflex Repair Manual is prepared in the belief that only experienced camera repairmen will use it. It, therefore, contains little information or data relative to general camera repairs.

Its entire purpose is to depict to the service man, accustomed to servicing high grade cameras:

- (a) All the working parts comprising the National Graflex,
- (b) The inter-relationship of the parts,
- (c) Method of tearing down the several assemblies for repair or replacement of parts,
- (d) Procedure for re-assembling the working parts.

METHOD

There is provided herewith an elaborate set of photographs of the National Graflex in all of its stages of assembly insofar as the working parts are concerned.

The text in all cases ties back to specific illustrations (by Illustration No.) and to specific working parts (by Parts Number).

The illustrations in this manual play a major part in presenting the method of procedure. Illustration No. 1 shows the back or curtain side of the camera with the curtain guards removed.

Illustration No. 2 is the same view, with the curtain in a different position.

Illustration No. 3 is also the same view, with the curtain in still a third position.

These illustrations will be referred to at later stages.

DISMANTLING THE NATIONAL GRAFLEX

ILLUSTRATION NO. 4

Illustration No. 4 provides the logical starting point for dismantling the camera. It shows the top of the camera, and particularly the operating mechanism, with all parts in place.

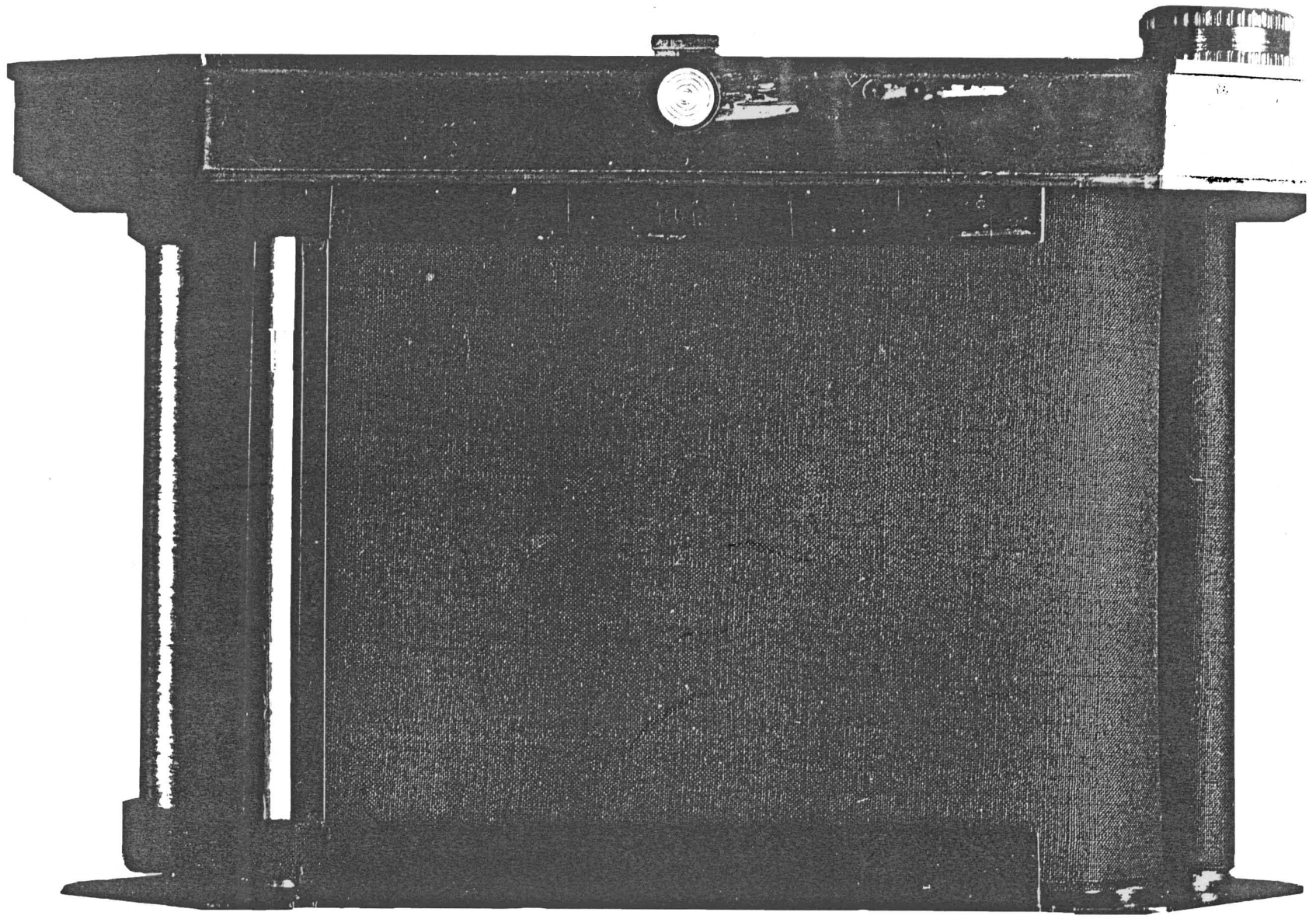
The first to be removed is the shutter knob and shutter dial #19440. Proceed as follows: remove screw in shutter dial plate and lift plate away.

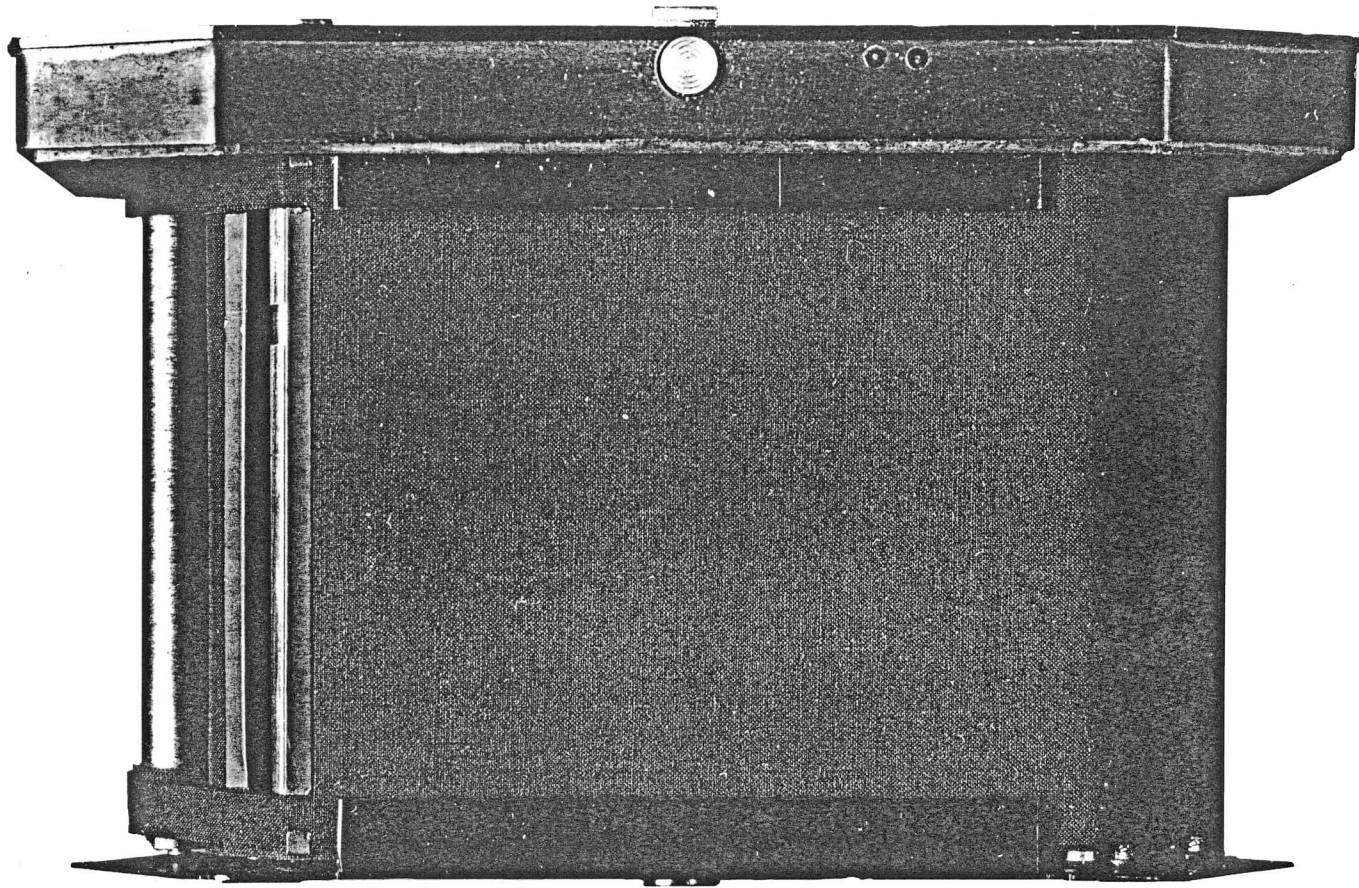
The shutter knob and dial unit will now appear as in:

ILLUSTRATION NO. 5

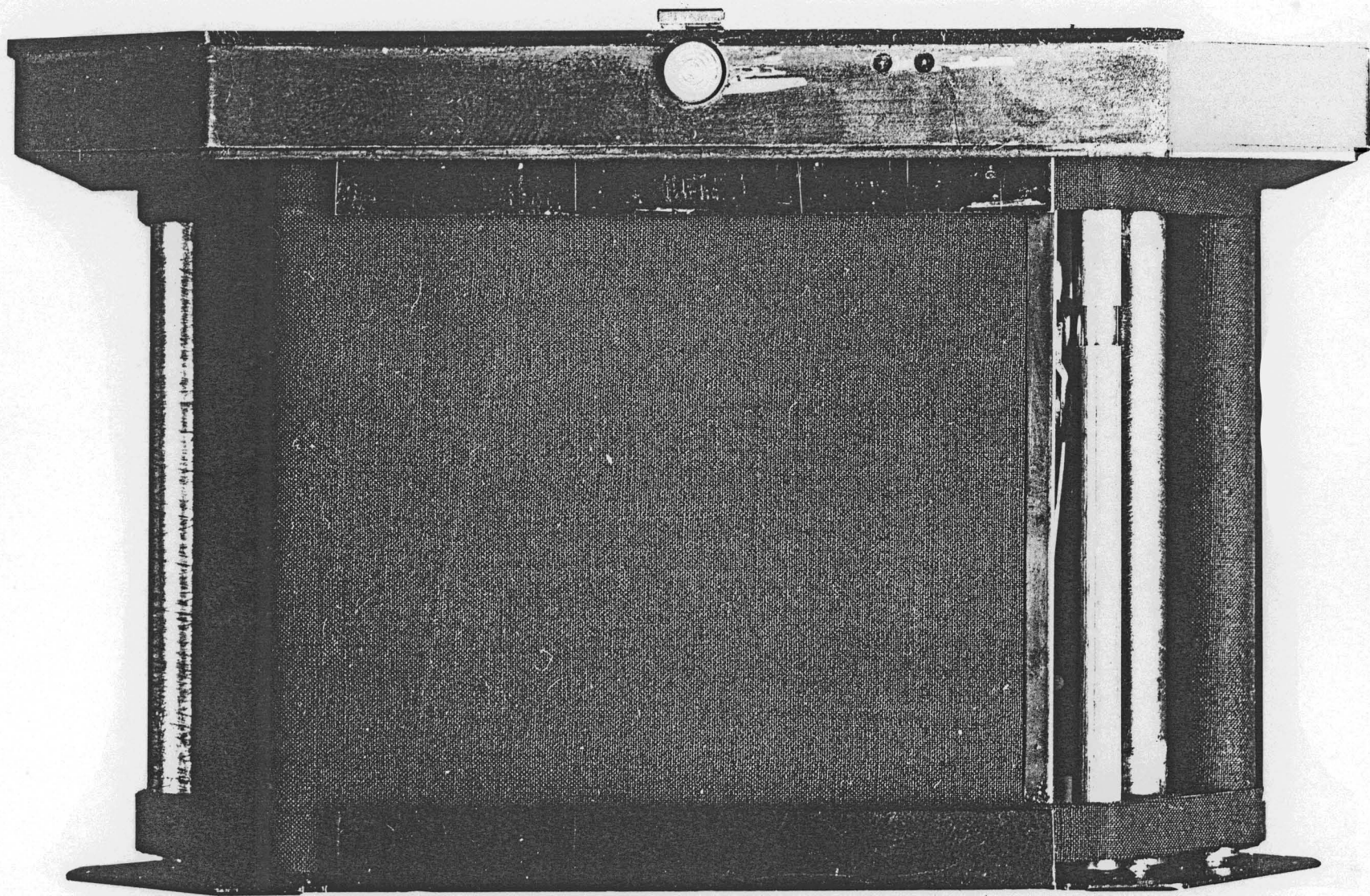
This illustration exposes the shutter setting stop plate #19439. This can be removed by lifting it out, the unit then appearing as in:

ILLUSTRATION NO. 6



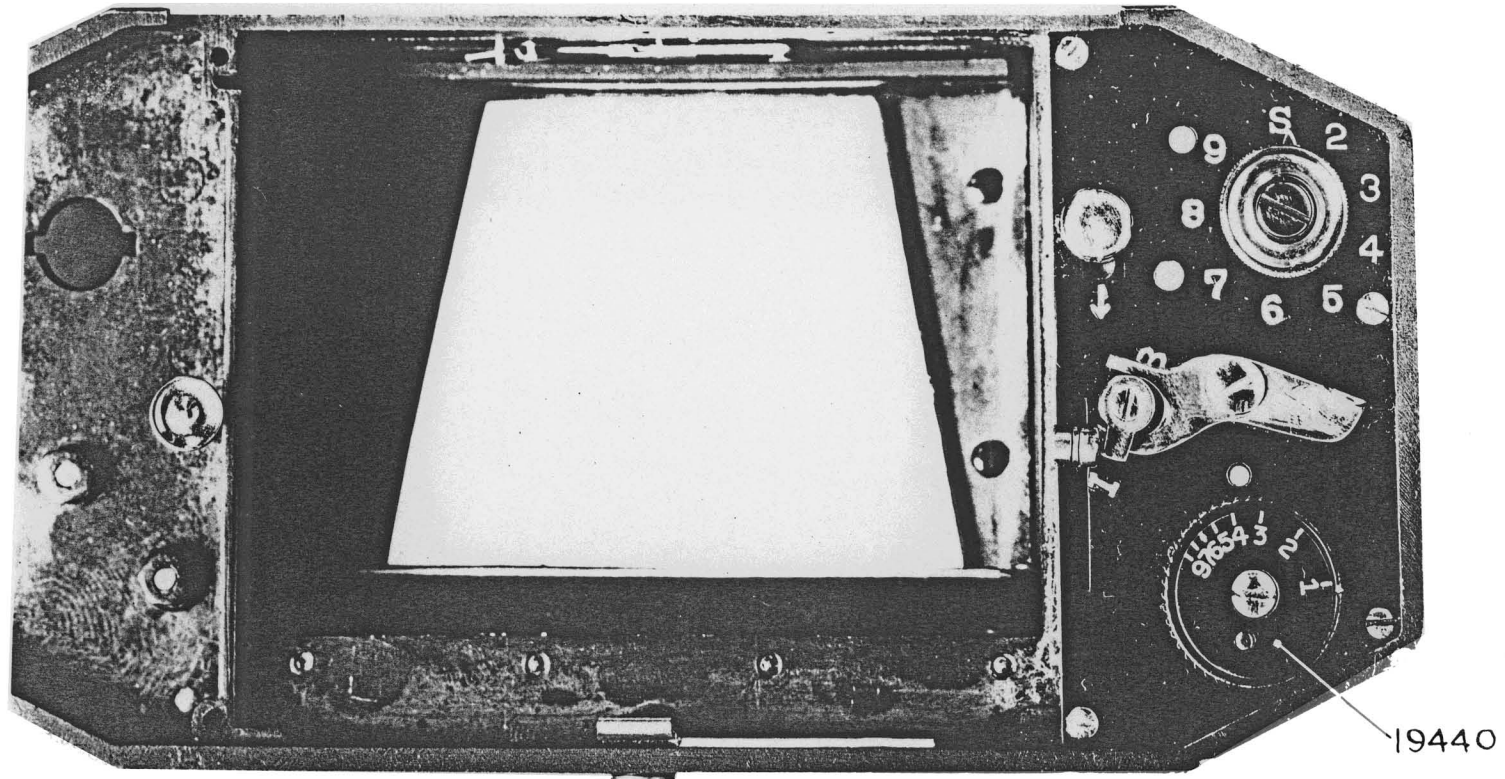


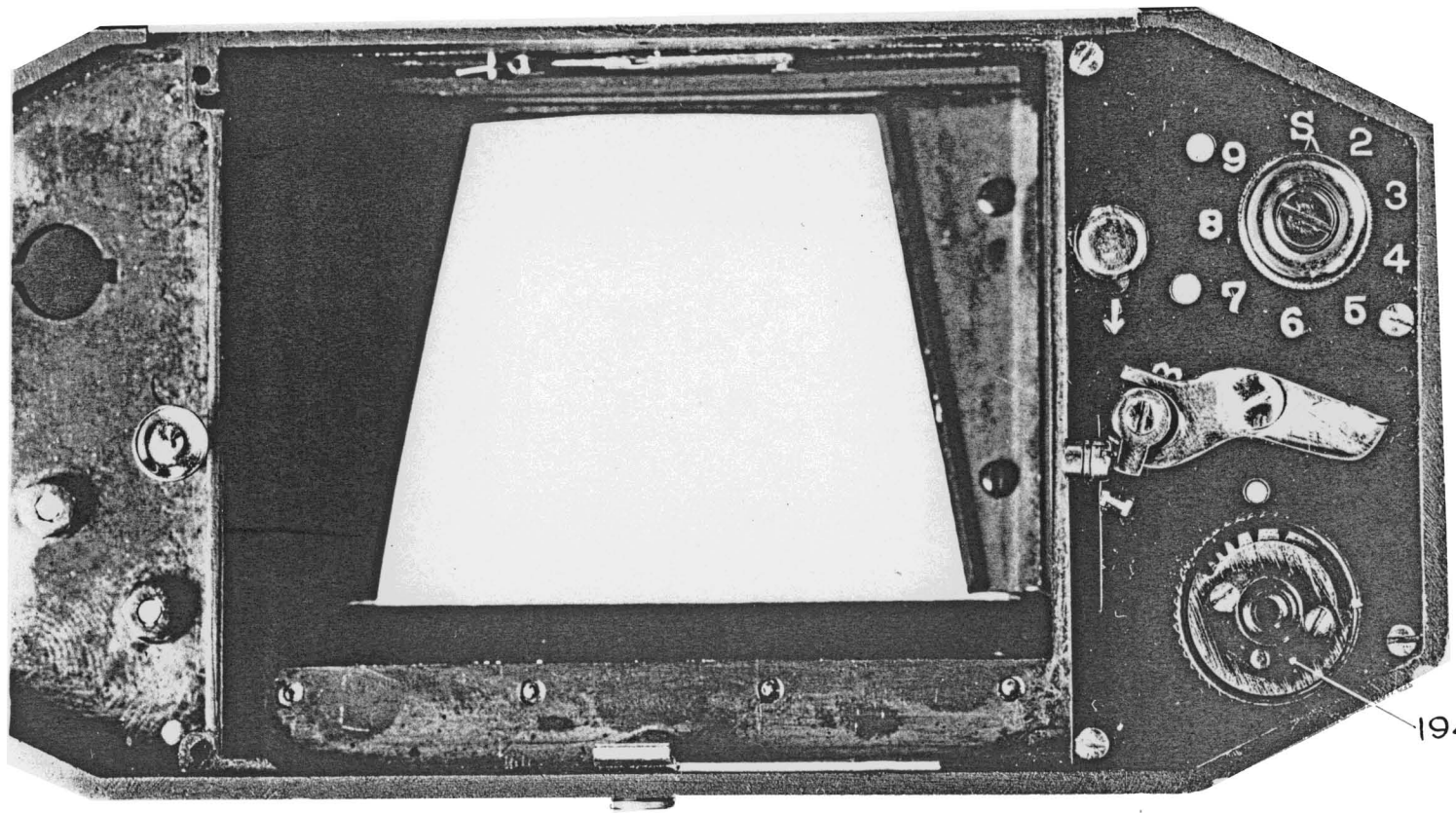
2



3

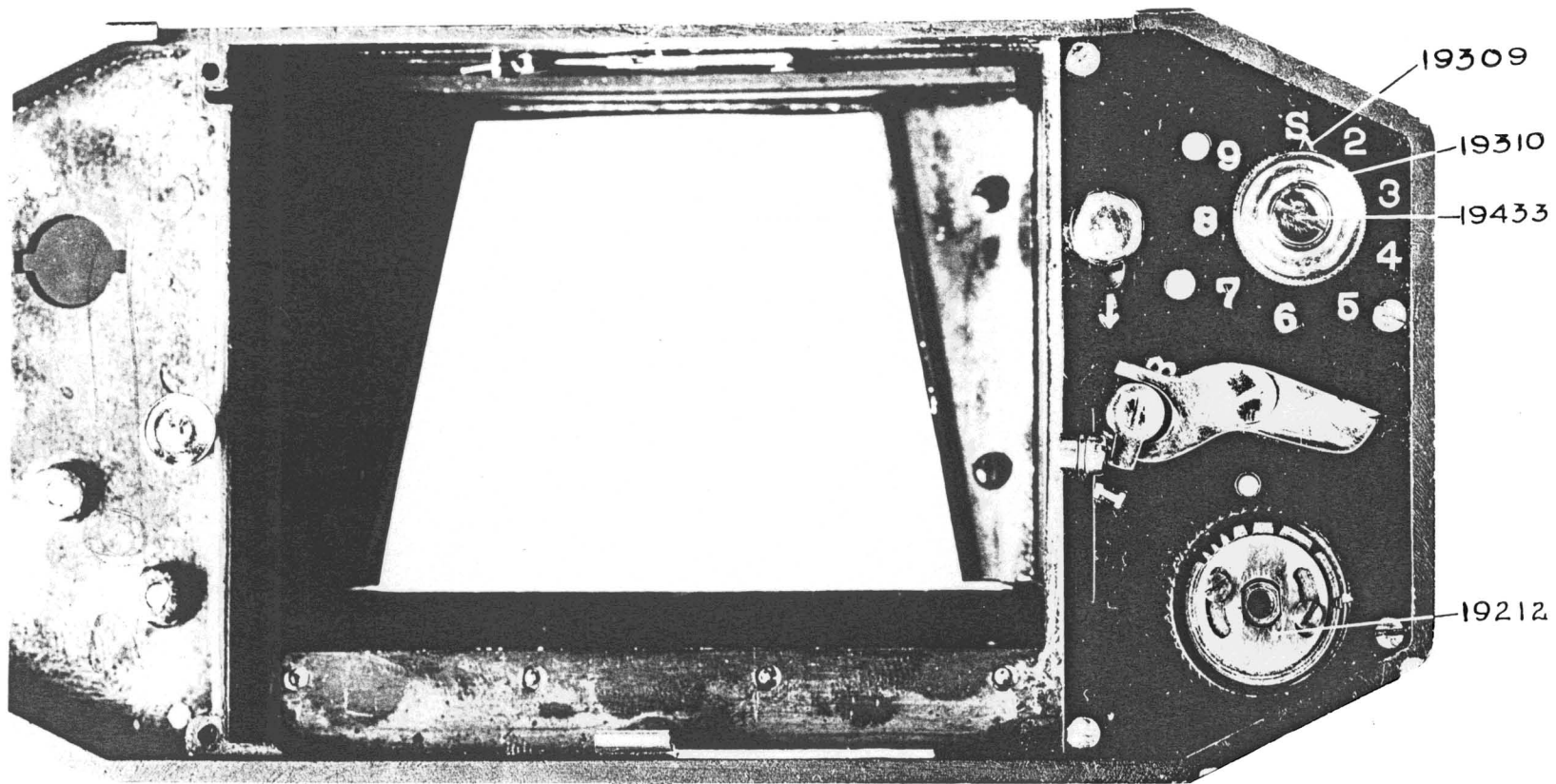
DISMANTLING THE NATIONAL GRAFLEX





19439

5.



6.

ILLUSTRATION NO. 6

Illustration No. 6 reveals the shutter curtain slot adjustment plate assembly #19212. This also lifts out without further manipulation.

At this point, remove screw #19433, knob #19310, and pointer #19319 which make up part of the film measuring mechanism. The whole now appears as in:

ILLUSTRATION NO. 7

Now lift shutter adjustment plate spring #19340 and shutter knob #19316 from the shaft. The plate now appears as in:

ILLUSTRATION NO. 8

Now remove screw #19392 and I.B. lever #19379. Then take out screw #19369 and #19370. All detachable parts have now been removed from the camera plate, the latter now appearing as in:

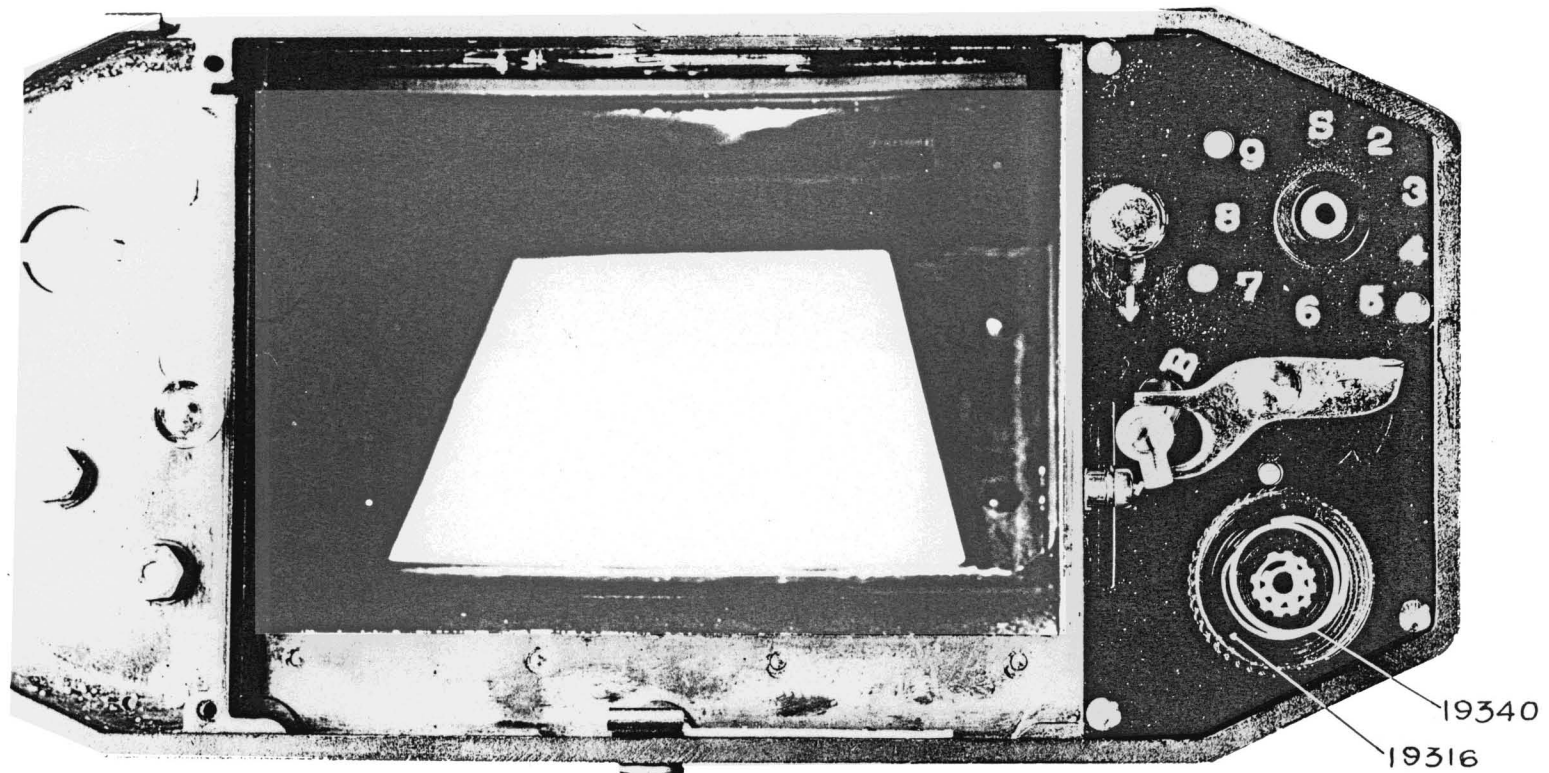
ILLUSTRATION NO. 9

Now remove the four identical screws #19429; then lift plate #19171 from the camera. The working parts of the camera will now be exposed as in:

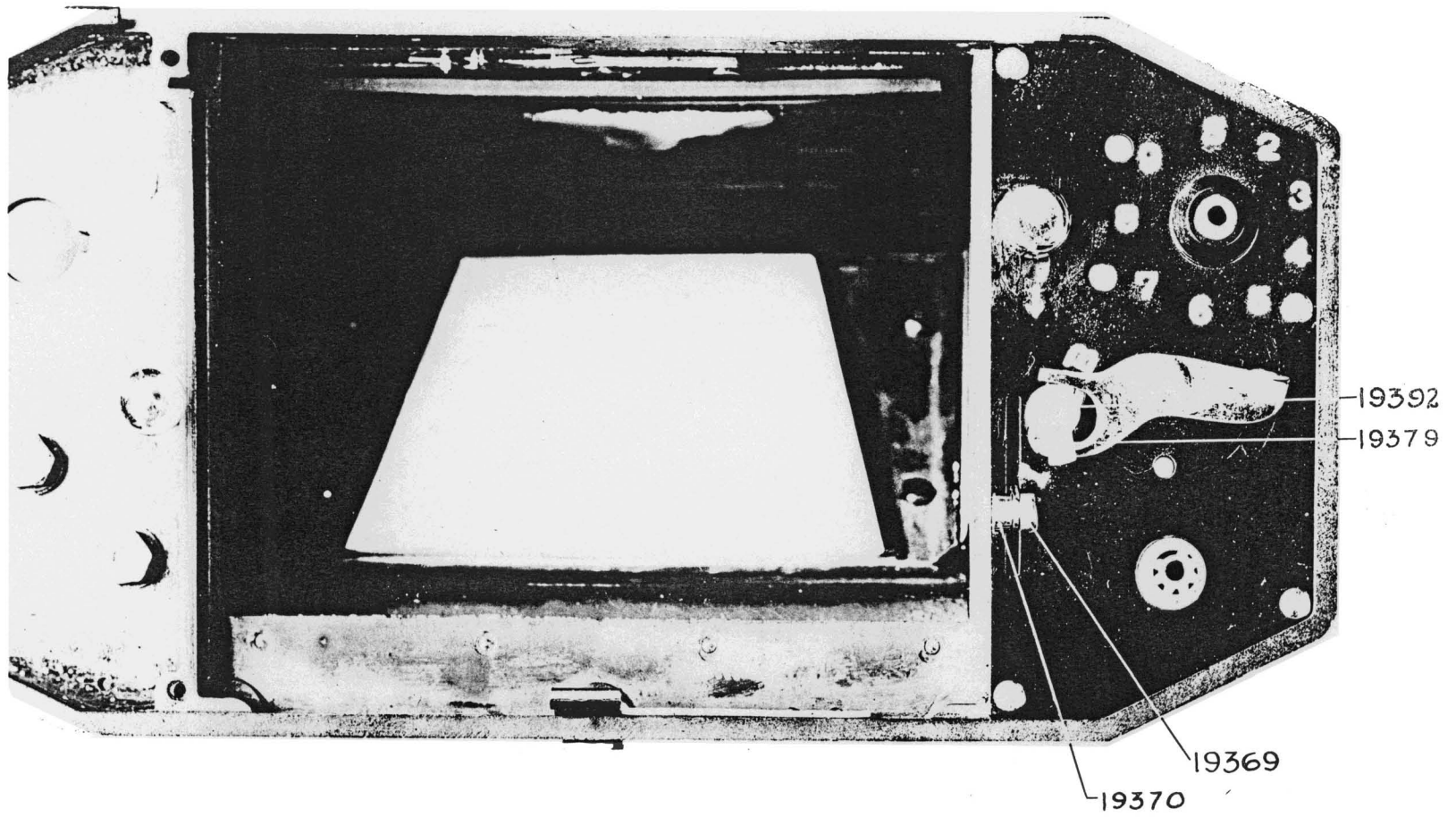
ILLUSTRATION NO. 10

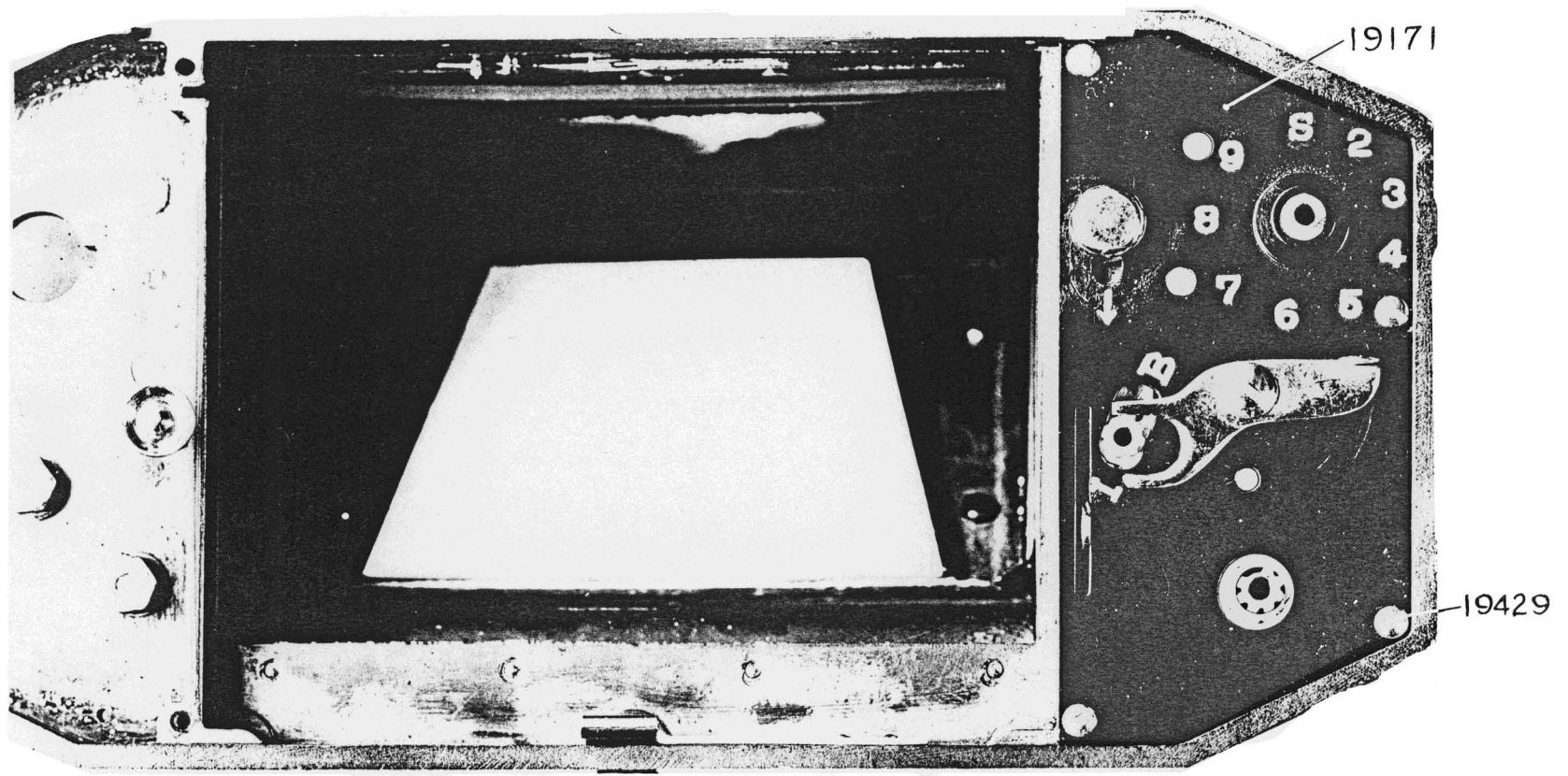
Illustration No. 10 exposes all the working parts and shows the correct inter-relationship between them. Note gear #19177 which will be referred to later. Remove this gear by lifting it off. The appearance now prevailing is shown in:

ILLUSTRATION NO. 11

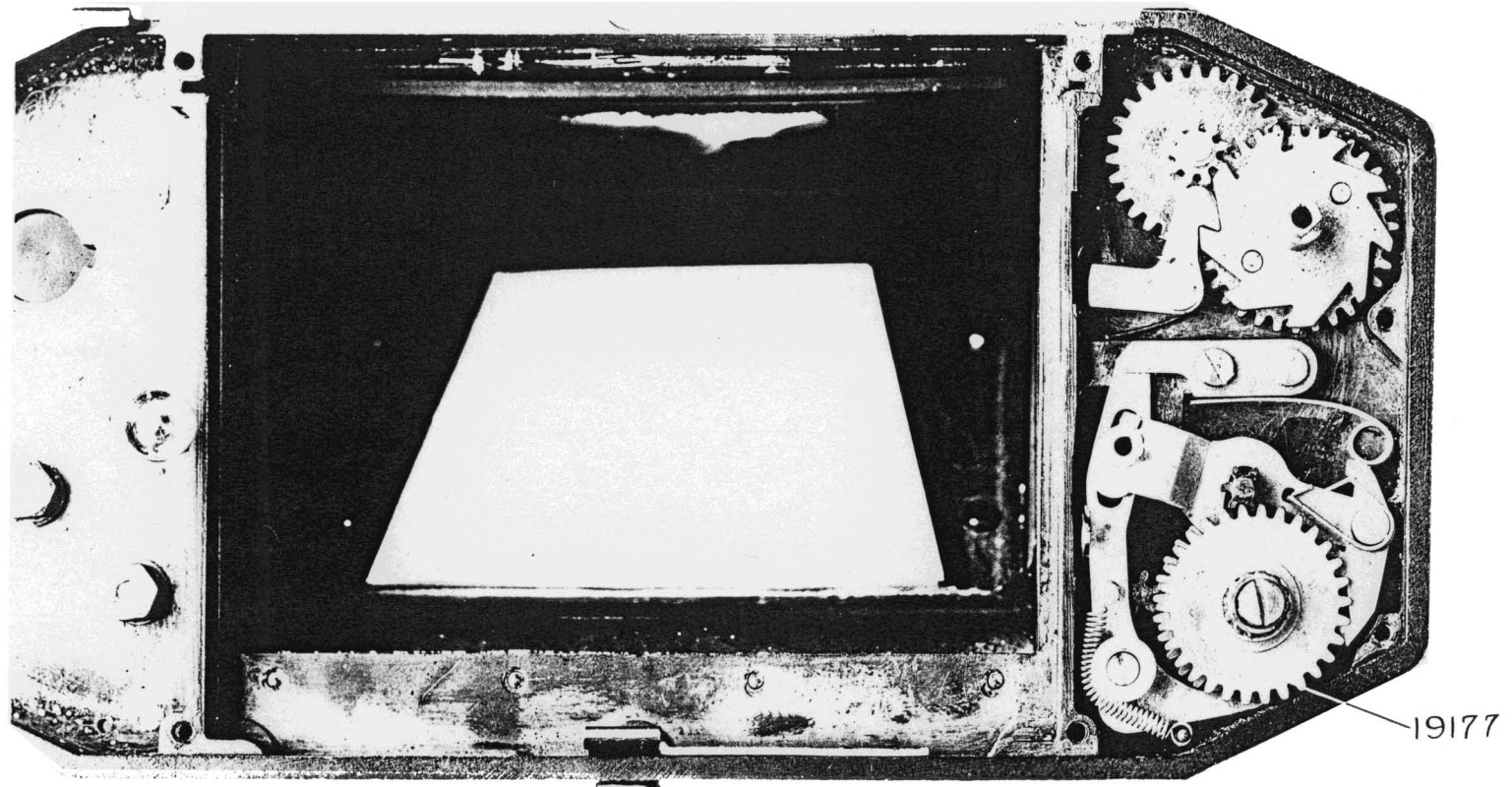


7.

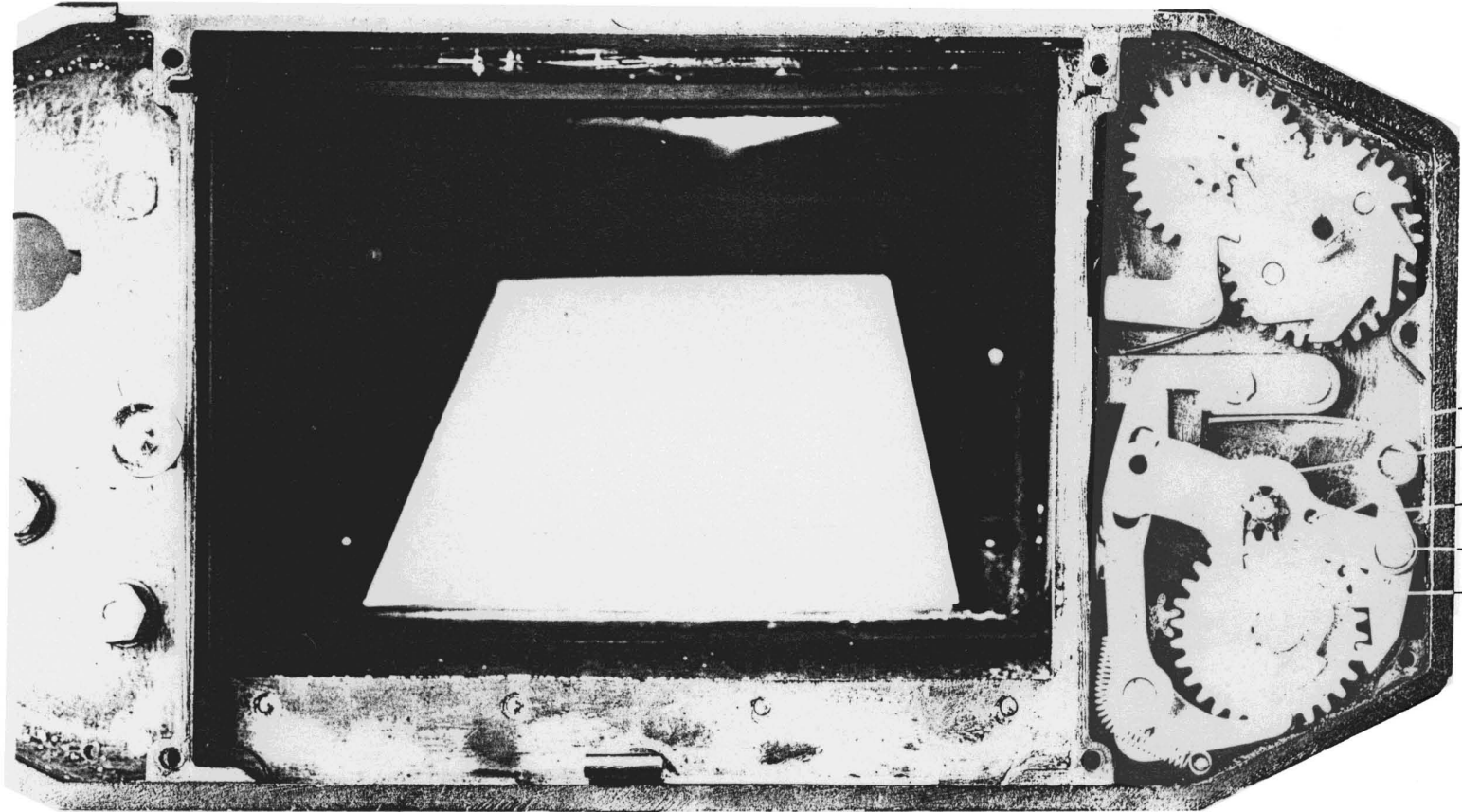




9.



10.



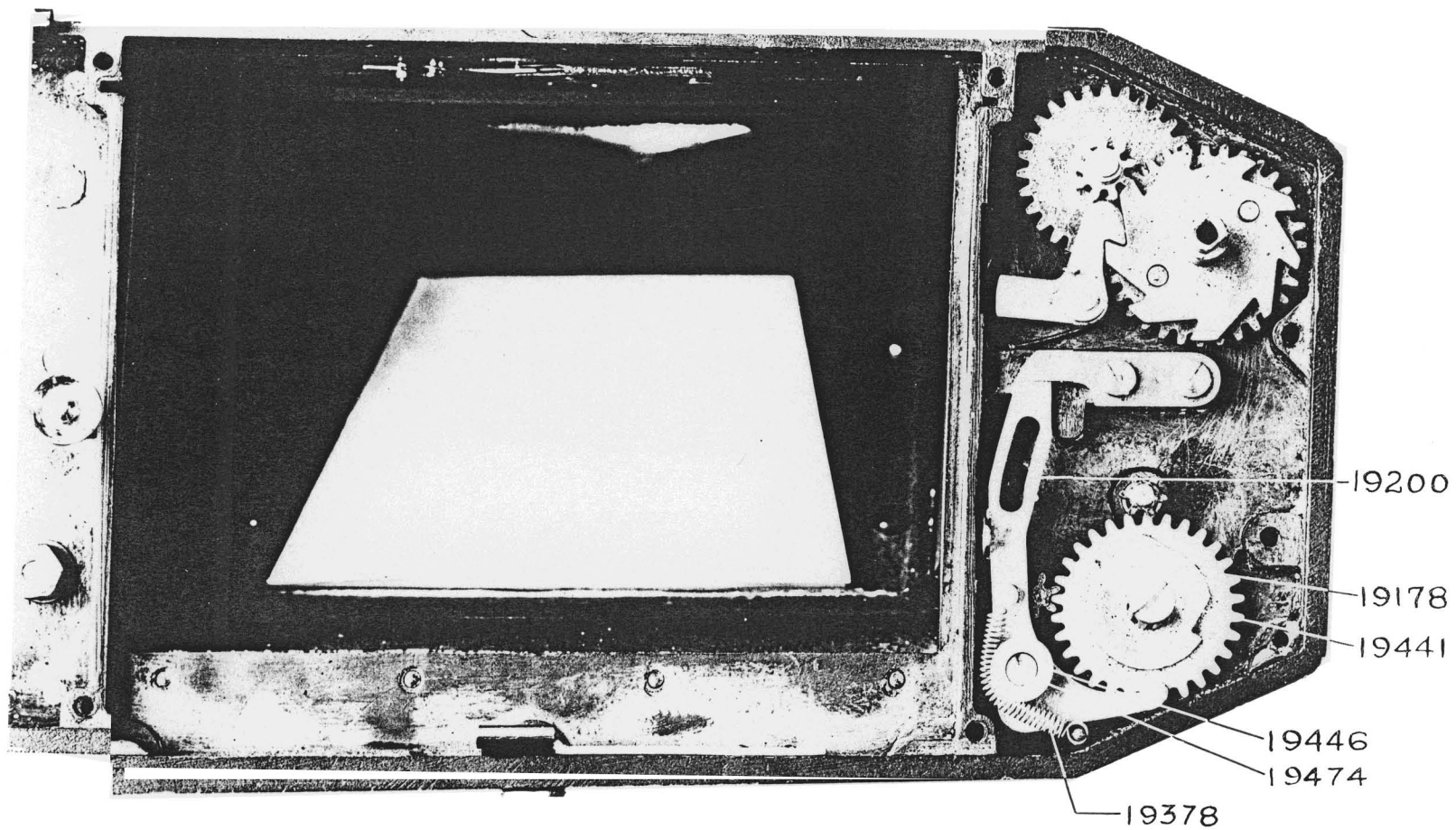
19432

19201

19431

19320

19383



12.

ILLUSTRATION NO. 11

In the order given, remove spring #19431, spring #19432, stud #19320, locking catch #19383, and shutter setting catch #19201. The mechanism now appears as in:

ILLUSTRATION NO. 12

Now remove spring #19378, roller #19446, stud #19474, bulb latch #19200, and gear #19178. All the shutter operating parts have now been removed, as in:

ILLUSTRATION NO. 13

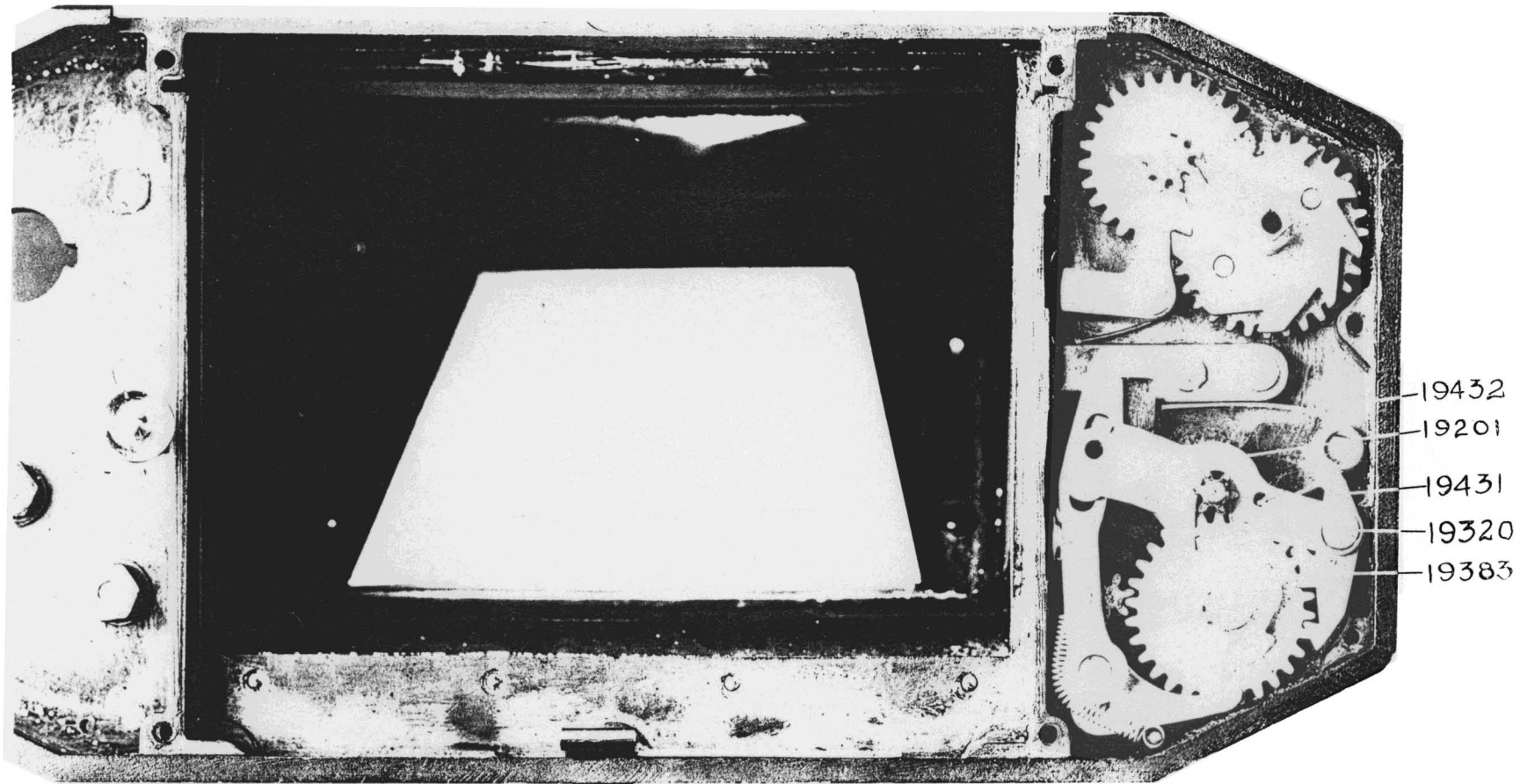
Shutter curtain gears are shown here. The outer curtain roller gear, #19161, will be referred to as the "movable curtain". The inner curtain roller gear, #19160, will be referred to as the "fixed curtain".

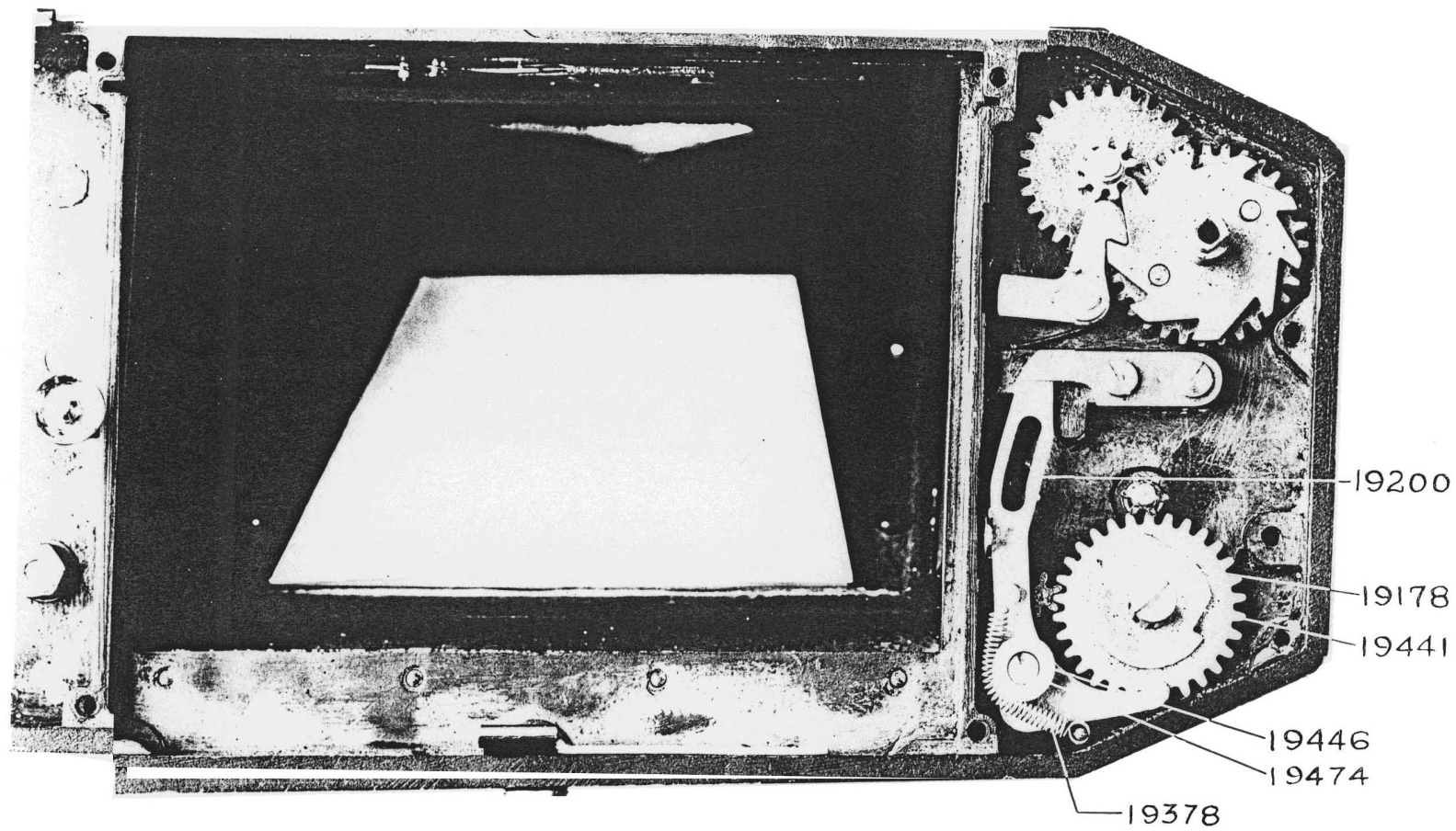
At this point the mirror set lever #19170 is exposed to view. Clearly shown, too, is the pin in this lever which actually trips the shutter when the mirror is released.

In this view the parts making up the film measuring device are shown. These include the intermediate gear #19174, ratchet gear #19173, ratchet #19175, and ratchet spring #19436.

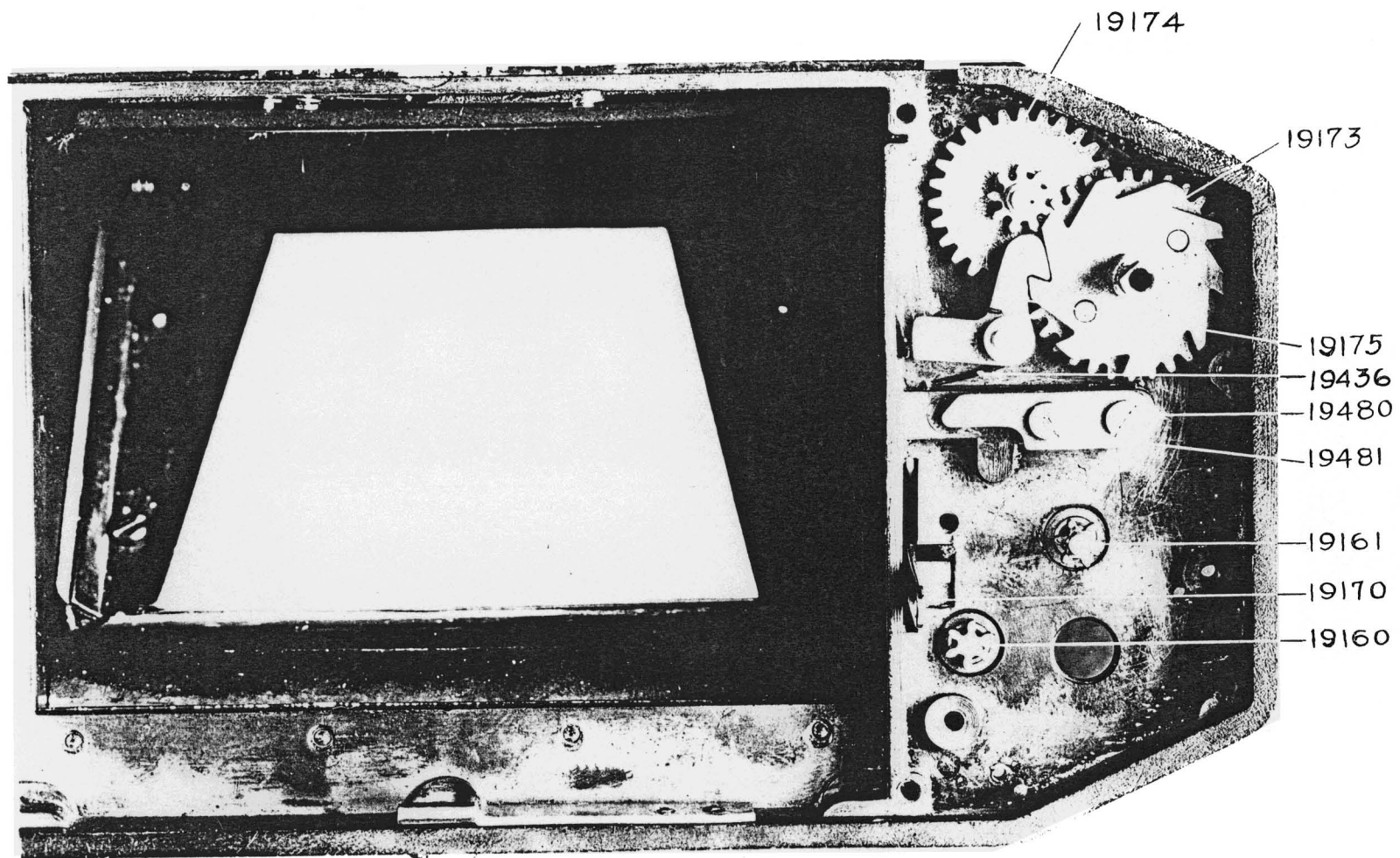
- - - - -

Up to this point we have taken from the camera, piece by piece, all of the parts in any way connected with the operation of the shutter. We believe you will be impressed by the sturdy construction, ruggedness, and compactness of the entire shutter mechanism. If these parts are removed from the camera, as illustrated and directed, there will be no danger of damaging any of the parts during the entire process of dismantling it.





12.



REMOVING SHUTTER CURTAINS

If for any reason the shutter curtains must be removed, it is necessary to have removed all of the parts heretofore discussed in the procedure outlined.

Proceeding from this point, remove the bottom plate of the camera. This is not illustrated since it is an obvious mechanical function. Next, remove the left cover plate partially pictured on Illustrations Nos. 4 to 12 inclusive -- that section carrying the film winding knob and the shutter release. To remove this plate, unscrew the four corner screws. The shutter release knob may be removed by unscrewing it, then lifting it out.

Under this left cover plate will be found two nuts holding the curtain tension roller. When these nuts are removed the rollers can be pulled out of the bottom of the camera. The rollers can be easily re-inserted -- or new ones installed -- by reversing this procedure.

In re-assembling, it will be necessary to put six or seven turns on the roller shaft with the curtains all the way run down, before tightening the nuts.

Further instructions relative to this manipulation seem unnecessary, since this manual will be followed only by experienced camera men.

ILLUSTRATION NO. 6

Illustration No. 6 reveals the shutter curtain slot adjustment plate assembly #19212. This also lifts out without further manipulation.

At this point, remove screw #19433, knob #19310, and pointer #19319 which make up part of the film measuring mechanism. The whole now appears as in:

ILLUSTRATION NO. 7

Now lift shutter adjustment plate spring #19340 and shutter knob #19316 from the shaft. The plate now appears as in:

ILLUSTRATION NO. 8

Now remove screw #19392 and I.B. lever #19379. Then take out screw #19369 and #19370. All detachable parts have now been removed from the camera plate, the latter now appearing as in:

ILLUSTRATION NO. 9

Now remove the four identical screws #19429; then lift plate #19171 from the camera. The working parts of the camera will now be exposed as in:

ILLUSTRATION NO. 10

Illustration No. 10 exposes all the working parts and shows the correct inter-relationship between them. Note gear #19177 which will be referred to later. Remove this gear by lifting it off. The appearance now prevailing is shown in:

ILLUSTRATION NO. 11

ILLUSTRATION NO. 11

In the order given, remove spring #19431, spring #19432, stud #19320, locking catch #19383, and shutter setting catch #19201. The mechanism now appears as in:

ILLUSTRATION NO. 12

Now remove spring #19378, roller #19446, stud #19474, bulb latch #19200, and gear #19178. All the shutter operating parts have now been removed, as in:

ILLUSTRATION NO. 13

Shutter curtain gears are shown here. The outer curtain roller gear, #19161, will be referred to as the "movable curtain". The inner curtain roller gear, #19160, will be referred to as the "fixed curtain".

At this point the mirror set lever #19170 is exposed to view. Clearly shown, too, is the pin in this lever which actually trips the shutter when the mirror is released.

In this view the parts making up the film measuring device are shown. These include the intermediate gear #19174, ratchet gear #19173, ratchet #19175, and ratchet spring #19436.

- - - - -

Up to this point we have taken from the camera, piece by piece, all of the parts in any way connected with the operation of the shutter. We believe you will be impressed by the sturdy construction, ruggedness, and compactness of the entire shutter mechanism. If these parts are removed from the camera, as illustrated and directed, there will be no danger of damaging any of the parts during the entire process of dismantling it.

RE - ASSEMBLING THE SHUTTER MECHANISM

In anticipation of re-assembling the shutter mechanism, the unit will appear as in Illustration No. 13. It is assumed that all of the film measuring mechanism gears are in place. It is now desirable to build back to the status of:

ILLUSTRATION NO. 12

First replace gear and cam assembly #19178. Then, with the mirror set lever pulled all the way back -- that is, in the set position -- install the bulb latch #19200, stud #19474, roller #19446, and spring #19378. Gear #19178 should then mesh with gear #19160 (Illustration No. 13). Now we will build up to:

ILLUSTRATION NO. 11

Now install shutter trip latch #19201, locking latch #19383, stud #19320, spring #19431, and spring #19432. The mechanism will now appear as in Illustration No. 11 and it is at this time that the inner curtain is set. This is done as follows:

SETTING THE INNER CURTAIN

The outer curtain is wound by hand through manually turning the curtain roller proper so as to uncover the inner curtain which is also then wound all the way to the right, as shown in Illustration No. 3. With this inner curtain in this position and the gears meshed as shown in Illustration No. 11, cam #19178 and latch #19201 should assume the positions shown in Illustration No. 11. This is the setting for the fixed or underneath curtain.

THE OUTER CURTAIN

Next it is desirable to install gear #19177 as shown in Illustration No. 10. This gear is meshed with the outer or movable roller gear (#19161, Illustration No. 13) when outer curtain is in position as shown in Illustration No. 2 -- all the way run down. On the under side of this gear #19177 there is a cam which should line up with the slot in lock lever #19383 (Illustration No. 11) when the curtain is so located.

All the parts related to the shutter are now in place and the gears are in proper relation to the curtain roller, the mechanism appearing as in:

ILLUSTRATION NO. 10

Wind inner curtain until cam and latch are as in Illustration No. 11, then allow shutter to run down to the position shown in Illustration No. 2. It is now time to replace the top plate shown in:

ILLUSTRATION NO. 9

Plate #19171 should be carefully replaced. It will be necessary to hold the film release button in the locked position and to also guide the bulb lever over the protruding pin as it comes up through the shutter plate. Next install the four screws #19429. Now refer to:

ILLUSTRATION NO. 8

Install screw #19369 and nut #19370 on the mirror set lever. Then replace the I.T. set knob #19379 and screw #19392. Now refer to:

ILLUSTRATION NO. 7

Slip the shutter winding knob #19316 over its shaft and replace spring #19340 within the knob. Now refer to:

ILLUSTRATION NO. 6

ILLUSTRATION NO. 6

The curtains should be as they were installed, i.e., the underneath curtain wound all the way up and the outer curtain all the way down. By turning the knob which will move only the outer curtain, wind that curtain until it passes the inner curtain. Then, allow it to run back partially, leaving an opening of $5/32$ nds of an inch between the two curtains. In this position plate #19212 can be installed. The pin or projection in the shutter knob should mesh with the narrowest or #9 slot position on the shutter setting plate, i.e., part #19212.

It may be necessary to vary the slot somewhat to bring about ameshing of these two. After plate #19212 is in place, the slot can be adjusted by loosening the two screws on this plate, this act allowing the two parts of the shutter setting plate to be moved independently. With these screws so loosened, adjustment can be made between the two parts and the curtain can be set at any width desired. The normal setting is, as stated before, $5/32$ nds of an inch for the #9 position.

Illustration No. 6 shows the setting at the #1 position, or the all-the-way open curtain. This can be checked at this time to see if the setting is correct. It is merely necessary to pull the shutter knob up and set it to #9, wind the shutter and see if the curtain comes to the correct position.

In order to facilitate making this setting, it is well to temporarily install the screw normally used to hold the shutter setting dial in place over plate #19212.

When the correct relationship has been secured, the screw may be temporarily left in place while pointer #19309, knob #19310, and screw #19343 are installed. Now refer to:

ILLUSTRATION NO. 5

ILLUSTRATION NO. 5

Replace shutter setting stop plate #1439. This plate is used to keep knob from riding beyond position of the notches on the shutter winding plate. Now refer to:

ILLUSTRATION NO. 4

The dial can now be installed. Its correct position is automatically located by the pin in stop plate #19439.

GENERAL INFORMATION

SHUTTER

It may now be desirable to check the shutter performance and setting. Wind the shutter and set it at #9 on shutter setting dial. When tripped, the curtain should travel freely to the left and stop at position shown in Illustration No. 1.

A similar setting to shutter speed setting #4 should allow the curtain to obtain a position as shown in Illustration No. 3.

The description and examples given should enable an experienced camera man to follow through and make any other necessary or desirable shutter adjustments.

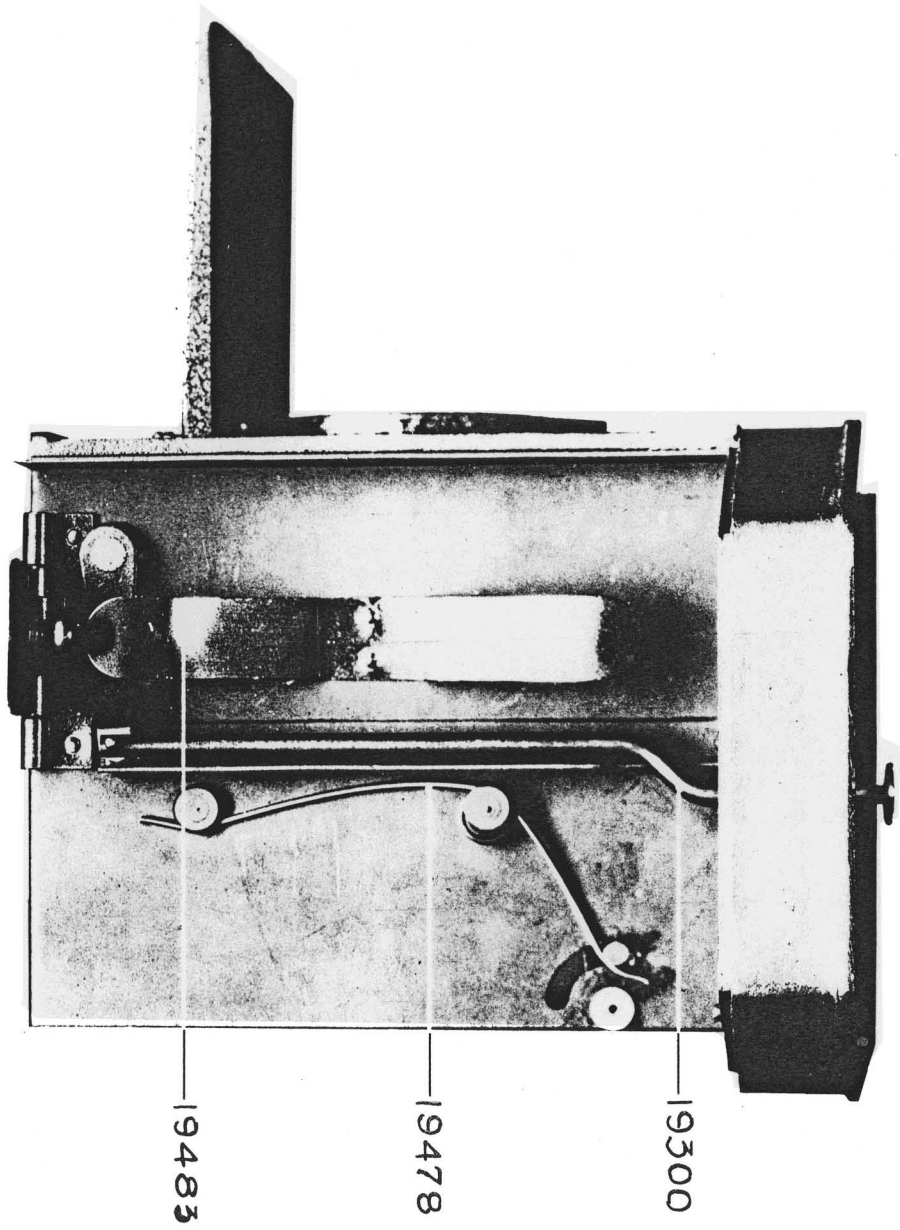
MISCELLANEOUS ADJUSTMENTS

ILLUSTRATION NO. 14

There are shown in Illustration No. 14 additional parts which may call for minor adjustment.

The mirror spring #19478: it may be necessary on occasion to install a new spring. Make sure that there is a slight curve on the top end of that spring where it goes under the stud, when the mirror is pushed all the way back, i.e., when the camera is fully closed. This curve is necessary in order to put a tension on the spring in starting the mirror away from the vertical position as the camera is opened. Lack of this curve and its attendant tension may be the cause of some binding or sticking mirrors.

Shown also in Illustration No. 14 is the mirror trip lever #19300, as well as the film pressure pad #19483, neither of which parts should present any difficulty to the type of worker who will use this manual.



14.

ILLUSTRATION NO. 15

Illustration No. 15 shows the placement of the mirror setting lever and exposes the mirror spring on this side of the camera. Note how very clearly the desired curve in the spring shows up in this instance near the top end of the spring. Note also the link between the mirror setting lever and the mirror proper.

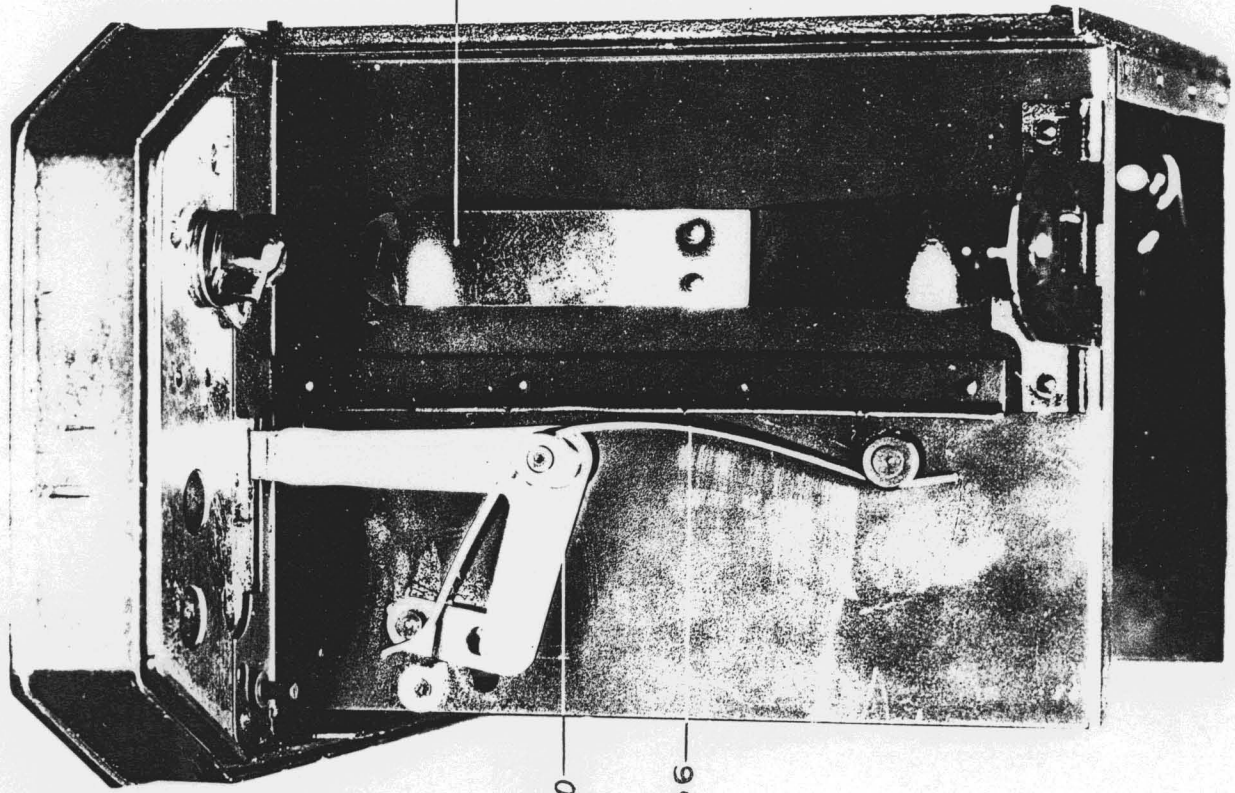
ILLUSTRATION NO. 16

Illustration No. 16 presents by individual number all of the parts which are used in the assemblies making up the shutter mechanism and the film measuring mechanism. It is believed that all of the parts which may ever be needed for repairs are pictured. These parts may be ordered by their accompanying parts numbers.

For any special information or data pertaining to the National Graflex, and not covered by this manual, write direct to the Service Department.

F O L M E R G R A F L E X C O R P O R A T I O N

ROCHESTER, NEW YORK



19483

19170

19336

15.

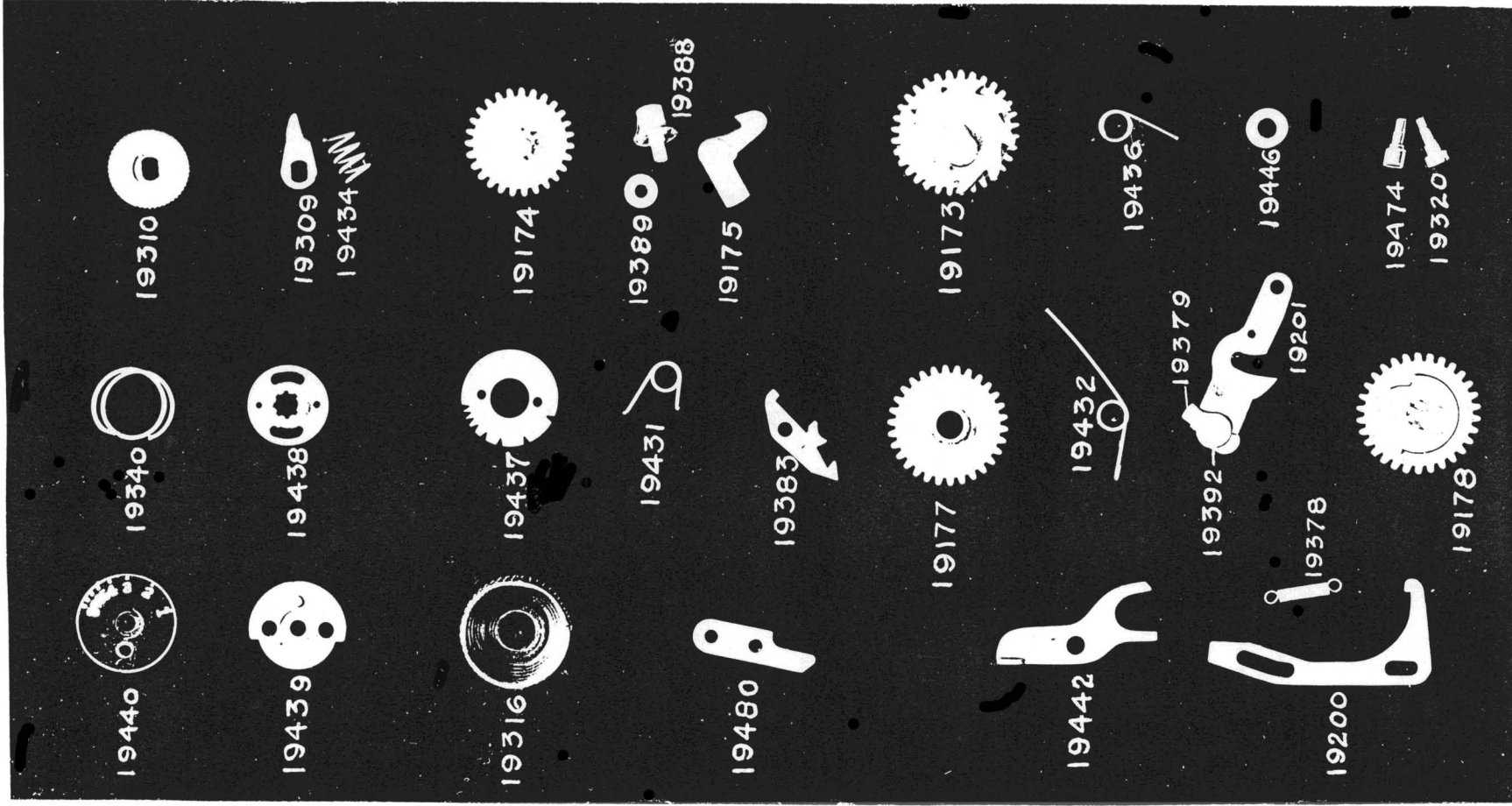


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