CALCULAGRAPH

MODEL 6

INSTRUCTIONS FOR

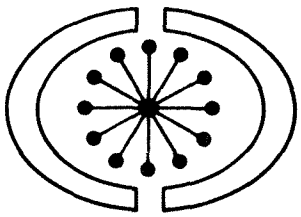
INSTALLATION - OPERATION - MAINTENANCE

CALCULAGRAPH Company

East Hanover, New Jersey

DEPENDABLE ELAPSED TIME COMPUTERS SINCE 1871

ESTABLISHED 1871



CALCULAGRAPH COMPANY

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MANUFACTURERS OF

ELAPSED TIME RECORDERS

CALCULAGRAPH
MODEL NO. 6

FOREWORD

Each individual part of the Calculagraph is inspected before being shipped from our plant; the assembled units are inspected; and the finished Calculagraph has had thorough running tests and checks against a master clock. After all adjustments are made and it is regulated, the completed Calculagraph is inspected and is not passed for shipment until it meets the requirements of our rigid final inspection.

WHEN YOU RECEIVE A NEW OR REPAIRED CALCULAGRAPH FROM THE CALCULAGRAPH FACTORY DO NOT TAKE IT APART OR MAKE ANY ADJUSTMENTS. IT IS READY TO PUT INTO SERVICE. See Section 1.01.

CALCULAGRAPH COMPANY

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GENERAL INFORMATION

Section 1.

1.01 INSTALLING NEW CALCULAGRAPH IN SWITCHBOARD

When a new Calculagraph is unpacked and ready to be installed, remove it from its case, see section 1.02, grasp the tag attached to the balance wheel clip and pull the clip out. This clip prevents the Calculagraph from running so it cannot be damaged in transit.

If this is a new installation and the Calculagraph is in a "C" case as shown in figure 1, to be installed in the switchboard, cut a round hole 8-3/4 inches in diameter in the wooden shelf on the switchboard, insert the Calculagraph and "C" case and fasten the case permanently with the four wood screws.

CAUTION: Be sure the Calculagraph is in its case when ready to locate screw holes in wooden shelf so front of case will be toward front of switchboard, as the case is not reversable relative to the screw holes. After locating the case, the Calculagraph may be removed while drilling holes for the four wood screws so sawdust will not get into the mechanism.

If the Calculagraph is purchased in an "A" case for mounting on a pedestal or elsewhere, secure it thru the three holes in the bottom of the case.

1.02 REMOVING CALCULAGRAPH FROM ITS CASE

Remove the two round head case post screws, see part #85, figure 1, grasp the Calculagraph by its two handles and lift it straight up out of the case.

GENERAL INFORMATION

1.03 SETTING THE TIME OF DAY

With thumbs or forefingers under front of sash pry it up open to get at the clock hands.

When setting the Calculagraph turn the minute hand in either direction about five minutes behind the correct time then turn it ahead to the correct time. This also sets the time of day printing pointers. After about one or one and one half minutes, to allow for taking up any possible slack in gear trains, the time of day print will agree with the hands. The elapsed time dials will not be affected in any way as they are on a separate gear train and cannot be set.

Be careful not to move the hour hand with your fingers when setting the time. If the hour hand has been moved accidentally, just turn it to agree with the hour indicator on the printed record.

1.04 A.M. - P.M., TO SET

If the printed record shows AM when you want it to show PM, or vice versa, merely turn the hands ahead twelve hours.

1.05 READING THE TICKET

The Calculagraph prints three dials, the right hand dial shows the time of day. If it is a twelve hour time of day dial like the ordinary clock face, see figure 11, the triangle on the outer edge of the dial is the hour indicator and the inside pointer shows minutes. AM or PM are stamped separately above and at left or right of dial.

To read the elapsed time, first read the middle dial then add the reading of the left hand dial to it for total elapsed time.

The left hand dial reads in minutes and quarter minutes, and there is a small five second dot beyond each minute dot which shows when to charge for the next minute.

The middle dial has a special three minute dot which indicates when an overtime charge starts.

If your Calculagraph has a twenty-four hour time of day dial, figure 12, the left hand side of the dial is AM and the right hand side is PM. There is no AM or PM stamped separately.

1.06 HANDS, TO REMOVE AND REPLACE

See figure 1. With thumbs or forefingers under front of glass sash pry it up open to get at the hands. Unscrew nut, Part #140, on top of hands and pull the minute hand straight up and off without turning it. The hour hand can be pulled off with a twisting motion. When replacing the hands first stamp the time of day on a ticket, then set the visible hands to agree with the printed record. After the hands are in place hold the minute hand so it will not turn and screw the nut on in place.

GENERAL INFORMATION

CAUTION: Be sure there is a little space between the hour hand and the clock face and between the hour hand and the minute hand after pushing the minute hands into place and tightening the nut.

1.07 PLATEN HOLDER, TO REMOVE AND REPLACE

Remove the hands, see section 1.06, then remove the two platen holder screws #78, see figure 1. If necessary pry platen holder up gently.

1.08 TICKET PLATE, TO REMOVE AND REPLACE

Remove the three ticket plate screws #93, see figure 1, and pull the ticket plate out toward the front of Calculagraph.

When replacing the ticket plate be sure the end hinge pins of the hinged gate, figure 2, are in their slots.

If your Calculagraph is one of the models which prints the date, you must first remove the date block #142 figure 2, before removing the ticket plate. See first part of 1.12. When replacing a dating type ticket plate be sure the end hinge pins of the hinged gate, figure 2, are in their slots. Make certain the ticket gate does not get under the ribbon.

1.09 RIBBON, TO INSTALL A NEW ONE

CAUTION: Never apply ink or liquid to an old ribbon, it will fill up the printing characters, gum up the bearings and finally cause the movement to run slow or stop.

Be sure you use Genuine Calculagraph "Snap-On" ribbons, they will last for a long time. Inferior ribbons often contain chemicals which eat or damage the printing type and make it necessary to replace these parts frequently.

After removing the Calculagraph from its case, as described in Section 1.02, the ribbon may be changed by first removing only the ticket plate, section 1.08. However, it is usually desirable to clean the printing type when changing a ribbon, in which case the platen holder is removed too; section 1.07; this also makes it easier to get at the ribbon.

Grasp the portion of ribbon on the top side of the Calculagraph and pull it till it is completely unwound from both spools, then pry the ribbon hooks off the spools with a small screw driver or any handy tool. Note that the ribbon spools have a keyway or slot cut lengthwise in them as well as the wide groove running around them near the middle.

CAUTION: When installing a new ribbon be sure the key or flange, which is bent inside the ribbon hooks from end to end, is fitted into the keyway or slot in the ribbon spools, if this is not done the ribbon reverse will not work properly.

Drop one end of ribbon down thru the opening in main plate, clamp the ribbon hook onto the ribbon spool and wind the ribbon onto the spool by turning the thumb wheel #10-3L or 10-3R, figure 4, till about a foot of ribbon is left. CAUTION: Turn wheel at right side counter clockwise and wheel at left side clockwise. All Calculagraphs unless very old, have an arrow on the thumb wheel showing direction to turn when winding ribbon.

Now if you have removed the platen holder, just drop the free end of ribbon down through the opening at the other side and clamp hook to spool; be sure key of hook is in slot of spool; then wind a few turns of ribbon onto spool until ribbon is taut.

If the platen holder was left on and only the ticket plate was removed, assemble ribbon as already instructed till it is almost completely wound on one spool, then grasp the ribbon at each end of the platen holder slot with right and left hand, keep it stretched taut, and work it into the slot. Now drop the free end of ribbon down the opening and clamp hook to spool. Wind about six to ten turns of ribbon onto spool till ribbon is taut to protect ribbon reverse mechanism.

Replace the parts which were removed preparatory to changing the ribbon.

1.10 PRINTING PLATEN, TO INSTALL

Remove hands, see Section 1.06, then remove platen holder, see Section 1.07. Lay platen holder assembly upside down on a cloth so the glass will not get scratched or damaged. Now remove the two printing platen screws, #77 figure 5, and remove the printing platen.

CAUTION: If there is paper padding glued to the metal platen holder under the printing platen, do not disturb it. This padding has been built up carefully in the proper places to assist in giving a good print.

Without sliding or otherwise disturbing any padding lay the new printing platen in place, with the beveled edge toward the front of the platen holder press the beveled edge into place. Now hold a screw driver, flat side down, on the back edge of the printing platen, figure 5, and draw it from end to end once or twice to press this back edge firmly down into place in the platen holder. Run the screw driver similarly along the front edge of the printing platen. Replace the two printing platen screws then reassemble the platen holder unit and hands.

ADVISABLE - Any time the platen holder is off, the printing type should be cleaned, see Section 3.02.

1.11 REGULATING

When a Calculagraph is shipped from the factory the regulator pointer is set in the middle of its slot which is just under the figure 12 on clock face.

The Calculagraph can be made to run as much as ten to fifteen minutes slower or faster per day by moving the regulator.

GENERAL INFORMATION

1.12 SETTING DATE ON DATING MODEL CALCULAGRAPHS

Get the square end dating key #108, figure 2, from the dating type box and unscrew the hollow square head screw on the dating block. When the screw feels free tilt key toward clock face and draw block out. Slide the center clamp away from the middle date type and with the tweezers remove this type and replace it with the desired date. Push clamp back against type, insert dating block back in place and tighten screw with square end key.

1.13 TICKET, SIZE, WEIGHT, ETC.

Two common sizes which are widely used are 2½" wide by 5" long, or the standard I.B.M. tabulating card which is 3½" wide by 7-3/8" long, although any convenient size may be used in the Calculagraph.

Tickets should be sufficiently heavy and stiff to prevent bending or crumpling when slid quickly into the ticket slot against the stop.

The most commonly used paper is sulphite ledger paper, 28 pounds weight for 500 sheet 17" x 22", .005" thick; or standard I.B.M. tabulating card stock.

1.14 GENERAL REPAIRS

The Calculagraph Company maintains a first class, modern repair department at its plant in Hanover, N. J. where Calculagraph repair work can be done at reasonable costs. All worn parts are replaced by genuine new material and the work is done by skilled Calculagraph specialists.

The Calculagraph is ruggedly constructed and when repaired at the Calculagraph plant should operate trouble-free for a long period.

1.15 SHIPPING CALCULAGRAPH, HOW TO PACK

Place the Calculagraph into a box or heavy carton about one foot cube inside. There should be about two inches of crumpled paper or other soft material covering the bottom of the container inside, then jam soft packing material all around the Calculagraph between it and the container. Fill the space between the top of Calculagraph and the cover of the carton tightly with packing material so Calculagraph will be held firmly against bottom of container because if it is free to move inside the container, the handles may be forced through the cover or otherwise damaged in transit.

Calculagraph shipping cartons with packing inserts may be purchased from Calculagraph Company.

LUBRICATION

Section 2.

2.01 MOVEMENT

Once a year or as use and local conditions warrant, lubricate all bearings in the clock movement, except as noted in the next paragraph. Use Calculagraph clock oil #152 and use only enough to half fill the little oil sinks figure 6 in the clock plates at the end of each shaft. Never use a heavier oil.

CAUTION: Do not lubricate the hub of the time of day dial cup, #97 figure 6, nor the steel tube #99 in the clock plate into which this hub fits, nor the hour spool #25, which revolves outside this tube.

Do not oil hub of the large 134 tooth wheel directly under right hand barrel, figure 6.

The balance wheel bearings (jeweled screws) figure 6, may be oiled very slightly but be careful not to get any oil on the balance wheel itself or on the hair spring.

2.02 LEVERS AND RIBBON MECHANISMS

Use Calculagraph lever mechanism oil #153 or a good quality of light machine oil.

Twice a year, or as local conditions warrant, lubricate the following shown in figure 4; (1) the three lever bearings; (2) the bottom end of the plungers where they push against the levers; (3) the plungers where they enter the plunger tubes; (4) the center bearing of the ribbon shifter bar; (5) and put one drop between the two ribbon brake springs and their thumb wheels; also figure 1; (6) the top of the three plungers where they bear against the cams; (7) both sides of the two cams where they fit into the slot of the cam posts.

CLEANING

Section 3.

3.01 PLATEN

Remove the platen holder, Section 1.07. If the printing platen is merely dirty with ink and not worn, it can be cleaned by rubbing with a clean soft cloth moistened with alcohol. Don't rub too vigorously. If it is worn anywhere a new one should be installed.

3.02 PRINTING CHARACTERS

Remove the platen holder, instruction 1.07, and the ticket plate also if desirable, instruction 1.08. Grasp the portion of the ribbon at the top of the

CLEANING

Calculagraph and pull it far enough out to expose the printing characters, Figure 8. DO NOT USE A LIQUID HERE. IT WILL GUM THE BEARINGS.

First tuck a cloth around and under the printing characters or dies to catch any dirt which would otherwise fall into the mechanism. If dirt or foreign matter is packed in tightly, remove it with a wooden tooth pick. Do not use metal or lead pencil. Then use plastic type cleaner #155.

If the characters are only slightly filled up or are cleaned each time the ribbon is changed, press a half cake of type cleaner into the characters and roll it up. It will pull the loose dirt out from the characters and leave them clean. Repeat if necessary. Place type Cleaner back into its case for future use.

3.03 MOVEMENT

If the movement is very dirty and hasn't been cleaned in three to five years of constant use; the period depends on how much use it gets and whether the Calculagraph is used in a dusty or gritty atmosphere; the average Calculagraph should be returned to the Calculagraph factory for a complete overhaul. See Sections 1.14 and 1.15.

To give the movement a light cleaning, brush out all the dust or lint with a small clean paint brush about 1/2" to 3/4" wide. Camel hair is not stiff enough. Remove any matted foreign matter with a toothpick or match stick. Be careful not to brush against the hair spring or scape wheel.

OPERATION

Section 4.

4.01 TICKET - BEST METHOD OF HANDLING

The ticket should be heavy and thick enough for practical use as described in Section 1.13.

The ticket should be placed on the ticket plate and slid lightly into the ticket slot at an angle, see figure 9, back and to the right. When it hits squarely against the guide at the back of the slot, figure 10, it should be within about one inch of the right hand ticket stop; just slide it along the rear guide until the right end strikes the stop. It is now in position for printing.

IMPORTANT - The back edge of the ticket throughout its entire length must bear against the rear side of the ticket slot and the right end of the ticket must rest against the ticket stop before pulling the handle to print.

OPERATION

After a record is started on a ticket, this ticket may be removed while other records are started or finished on any number of other tickets. To finish a record insert the ticket again as before.

4.02 HANDLES

The handles must be pushed or pulled smartly and with sufficient force to give a good print on the ticket.

Always have a ticket in the slot when operating the handles or the platen will get smudged with ink.

Pull then push the right handle to start a record then remove the ticket so other records may be started or finished.

To finish a record insert the ticket again and pull left handle.

4.03 WINDING

Wind both main springs fully once a week. For best results, especially if movement is worn or dirty, wind regularly twice a week.

ADJUSTMENTS

Section 5.

5.01 RIBBON REVERSE

CAUTION: The ribbon reverse should never need adjusting unless it has been damaged or accidentally bent. Don't attempt to adjust it unless you have operated the handle on the empty spool side three or four times and found the reverse defective.

If the reverse mechanism on one side does not shift when the handle on that same side is operated fully, and the ribbon is unwound entirely from the spool on that side, bend the tail of that wing, figure 4, out away from the ribbon. To do this rotate the wing away from the ribbon and hold it thus, then bend the tail at its lower end near the screw and not up near the top end. A very slight bend will advance the shift considerably, so if it is bent too much another try may be necessary.

After adjusting the tail of the wing, wind about a dozen turns of ribbon onto the empty spool and pull the other handle once, then pull the handle you are working on once and continue pulling the two handles alternately until the tooth of the wing, figure 4, is caught and moves the shifter bar down till it snaps into its lower position. If the shift occurs too soon, that is, with ten or more turns of ribbon on the

emptying spool, you have bent the tail away from the ribbon too far, and it must be bent the other way a little.

During the trial just described, if some ribbon is unwound before the ribbon reverse shifts, stop operating the handles when the reverse occurs, put a heavy pencil mark on the thumb wheel of the almost empty spool, turn the thumb wheel at the other side of the Calculagraph slowly till the spool on the first side is completely unwound while watching the pencil mark as the ribbon unwinds to count how many turns of ribbon were on the spool when the reverse occurred.

For best operation the reverse should occur when there are from two to five turns left on the almost empty spool. Adjust the tail of the wing carefully as just directed till this result is obtained.

If the ribbon shifter bar is not carried down far enough to snap into its down position when the reverse occurs, see Section 5.02.

5.02 RIBBON FEED

If the ribbon shifter bar, see part #57A figure 4, is down on the left end the ribbon will feed toward the left hand and it will feed only when the left hand handle is operated. If the bar is down on the right end the ribbon will feed toward the right and it will feed only when the right handle is operated.

If the pawl, see part 40 figure 4, on the feeding side does not move down far enough to engage another tooth on ratchet wheel, see part #60 figure 4, of the ribbon spool when the handle is pulled, it may be necessary to turn the plunger screw one half turn up into the plunger. See instructions Section 5.03 and 5.04.

If the ratchet wheel is drawn backwards freely when the pawl moves down as the handle is pulled, the ribbon may not be taut and it will get wrinkled and be pushed back sideways when a ticket is inserted. In this condition the printed record will show only part of the dials. This is caused by insufficient tension on the ribbon brake spring bearing against the thumb wheel. If the screw is loose tighten it. If the spring does not bear heavily enough against the thumb wheel take it off, bend it a very little and put it back again. Straighten the ribbon out so it is free of all wrinkles and creases, wind about ten or fifteen turns onto either spool then turn gently on both thumb wheels to pull the ribbon taut. If the ribbon has been wrinkled or creased so badly that a ticket will catch it when all other adjustments have been made, discard the ribbon and put on a new one.

5.03 ELAPSED TIME DIALS PRINT

If the print is too light, yet the ribbon is fresh enough, and printing characters and platen are not badly worn, proceed as follows.

First be sure there are at least a few turns of ribbon on the left hand spool, then if the right end of the ribbon shift bar is not in the "down" position, depress it to this position so the right hand side is feeding the ribbon.

ADJUSTMENTS

Now locate the front right lever #31, figure 4 of the three long levers which are operated by the handles. Remove the pivot screw which the lever swings on after first unscrewing its lock screw one turn. Next remove this lever from the slot in the plunger and turn the plunger screw out one half turn, put the lever back in place again and tighten the lock screw. Repeat again if necessary, but do not overdo it. If after making the foregoing adjustment the cam #10 or #11 figure 1 does not either touch the main plate or come to within about 1/32" of it when the handle is pulled forward to the end of its printing stroke, you may find that the pawl which feeds the ribbon ratchet wheel does not go down far enough to catch a tooth and thus the ribbon will not move. You have turned the adjusting screw out too far.

5.04 ELAPSED TIME POINTERS PRINT

If the print is too light proceed as follows:

Proceed as in Section 5.03 except that each operation you do where 5.03 says right side, you substitute the word left, and where it says left you substitute the word right.

5.05 TIME OF DAY PRINT

If the print is too light, yet the ribbon is fresh enough, proceed as follows:

Locate the right rear lever of the three levers which are operated by the handles. Remove the pivot screw which the lever swings on after first unscrewing its lock screw one turn. Now remove this lever from the slot in the plunger and turn the plunger screw out one half turn, put the lever back in place again and tighten the locking screw. Repeat again if necessary but do not overdo it as the cam should either touch the main plate or come within about 1/32" of it when the handle is pushed back to the end of its printing stroke.

5.06 ADJUSTING DATING MECHANISM TO PRINT HEAVIER OR LIGHTER

In order to make the date print heavier or lighter hold a small screw driver in the slot at bottom of the dating arbor, figure 7, so arbor can't turn while unscrewing the lock nut. Now screw arbor up slightly for a heavier print or down slightly for a lighter print and while still holding arbor with screw driver, tighten lock nut. Don't overdo this adjustment. If you make the date print too heavy the time of day print may be a little too light.

USEABLE SUPPLIES AND ACCESSORIES - NOT REPAIR PARTS

RIBBONS - sold singly or in boxes of one dozen - Specify Calculagraph "Snap-On" Ribbons #50.

OIL, CLOCK OIL - Sold in 1,2,4,8 ounce and one pint containers. Specify Calculagraph Clock Oil #152.

OIL FOR THE PRINTING MECHANISMS & RIBBON MECHANISM - Sold in 2, 4, 8 ounce containers. Specify lever mechanism oil #153.

PRINTING PLATEN - Sold singly - Specify Platen #35.

CLEANER, PLASTIC CLEANER - Sold in single cans or in cartons of a dozen cans. Specify type Cleaner #155.

WINDING KEY - Specify winding key #28.

WINDING TOOL - Specify winding tool #135.

BOX OF DATING TYPE COMPLETE #103 - (for dating model Calculagraphs only).

PEDESTAL - Used to mount Calculagraph near switchboard when desirable - see figure 3. Specify pedestal #154.

CALCULAGRAPH PACKING CARTONS with packing inserts - All shipped flat or knocked down. Specify Model 6 Cal. packing cartons.

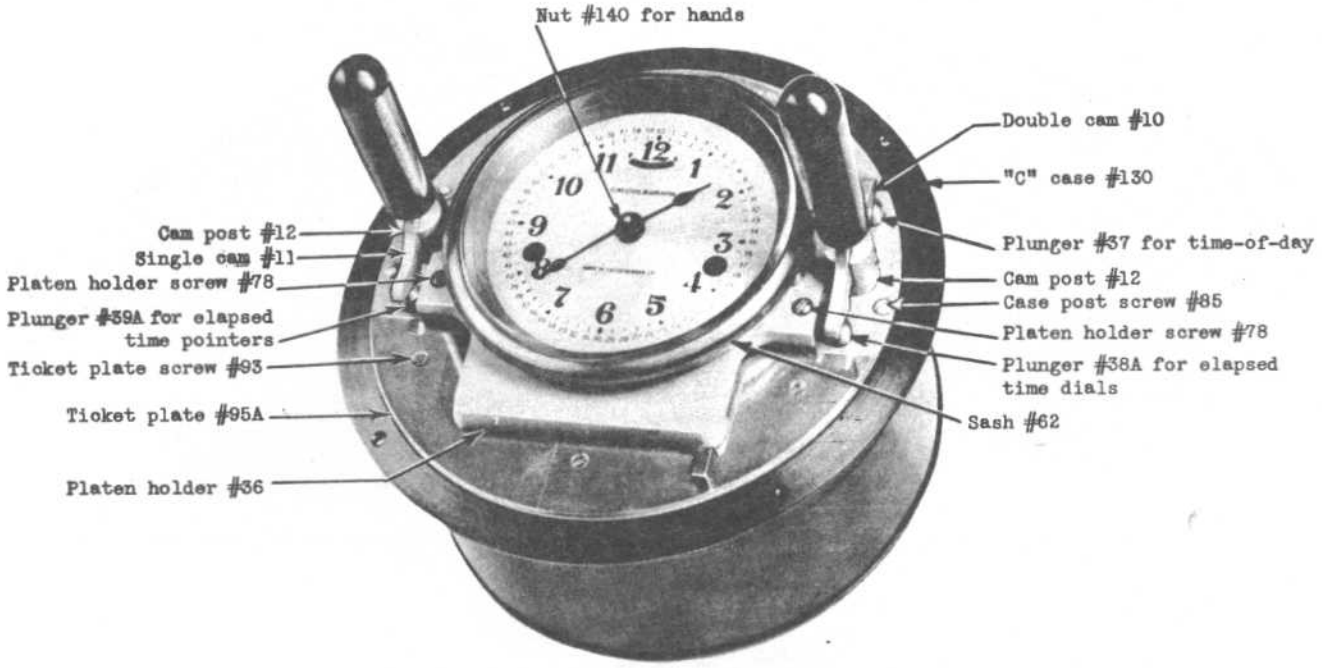


Figure 1 - MODEL 6 CALCULAGRAPH IN A "C" CASE

Figure 2

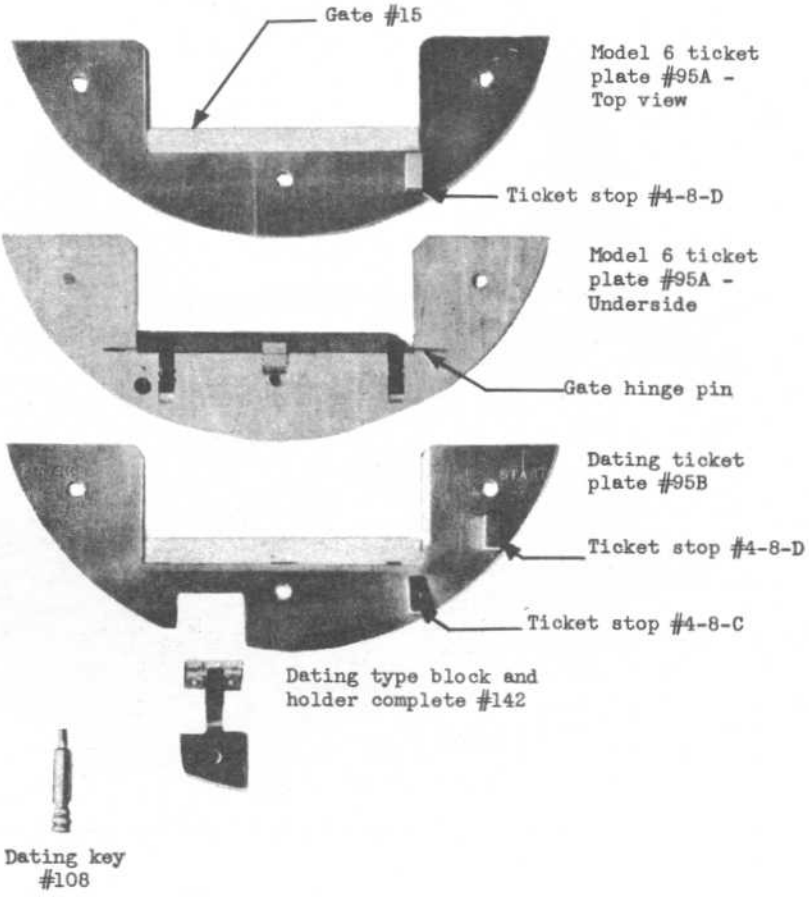


Figure 3

PEDESTAL WITH CALCULAGRAPH
IN AN "A" CASE

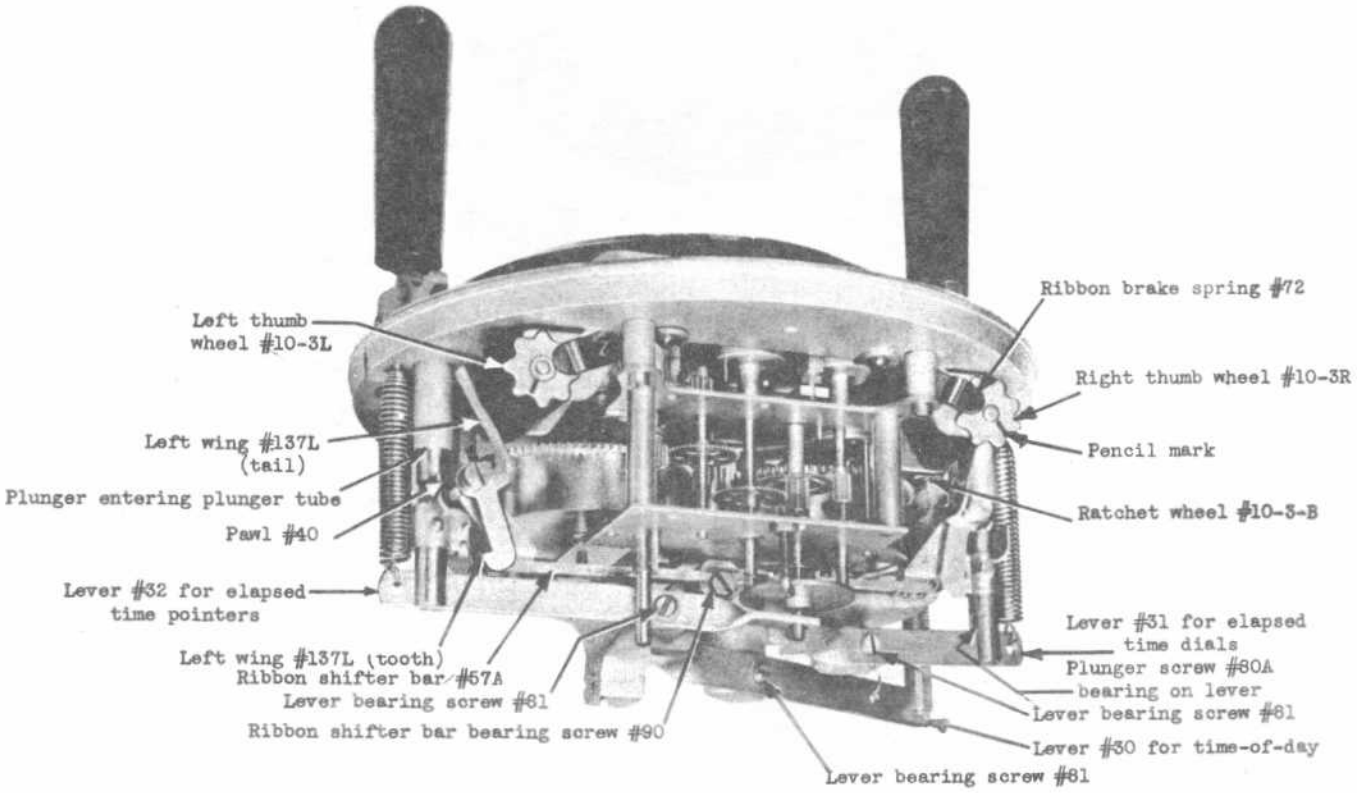


Figure 4 - MODEL 6 CALCULAGRAPH

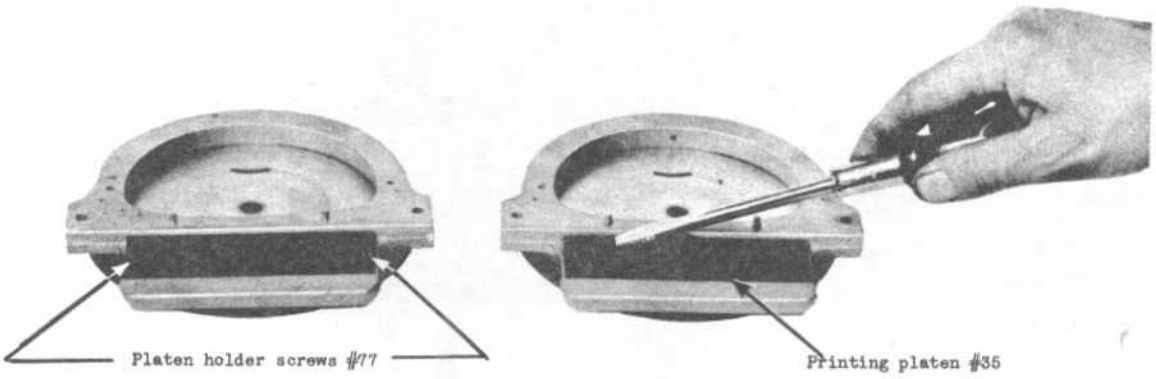


Figure 5 - PLATEN HOLDER #36

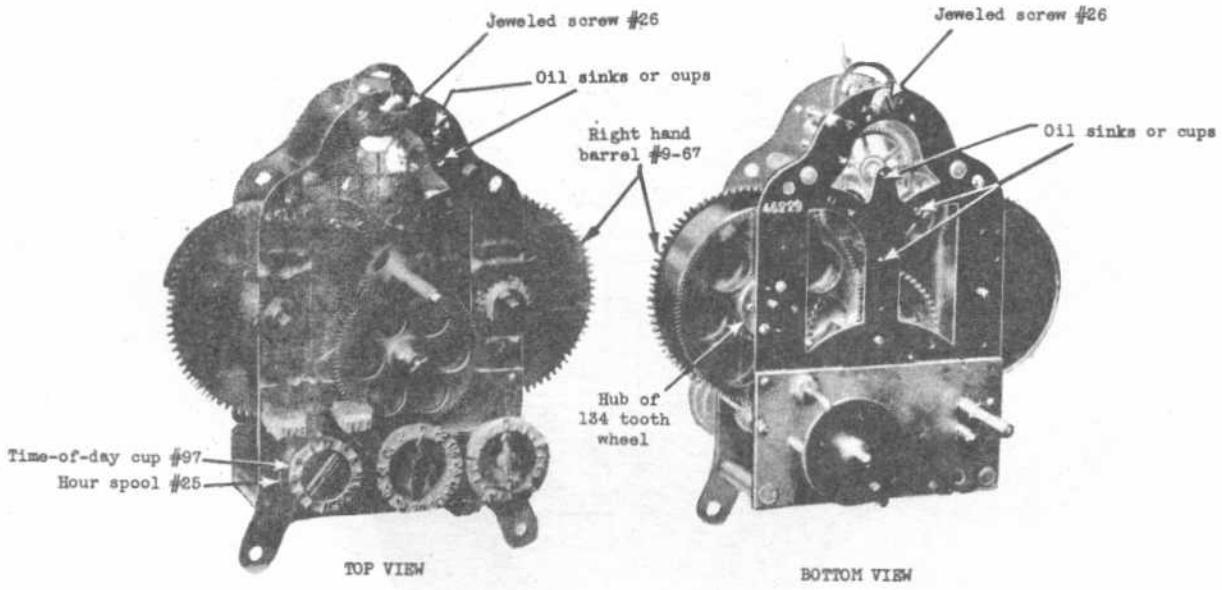


Figure 6 - CALCULAGRAPH MODEL 6 MOVEMENT

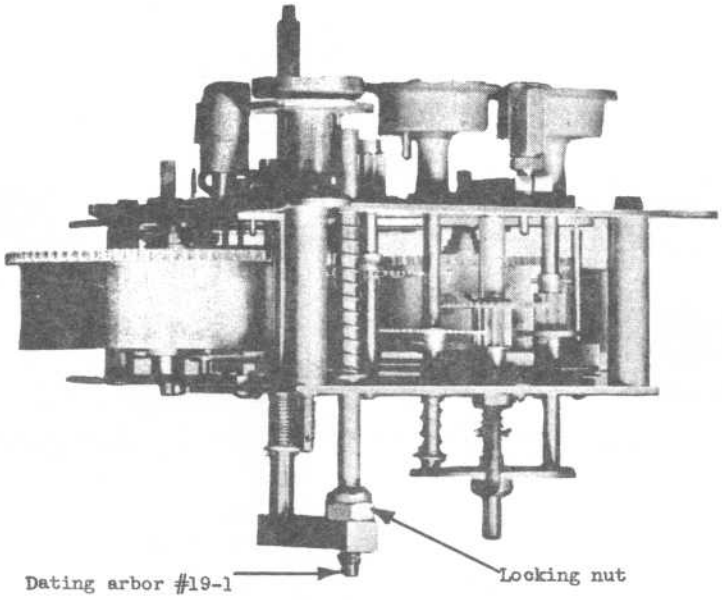


Figure 7 - CALCULAGRAPH MODEL 6 MOVEMENT
WITH DATING ATTACHMENT

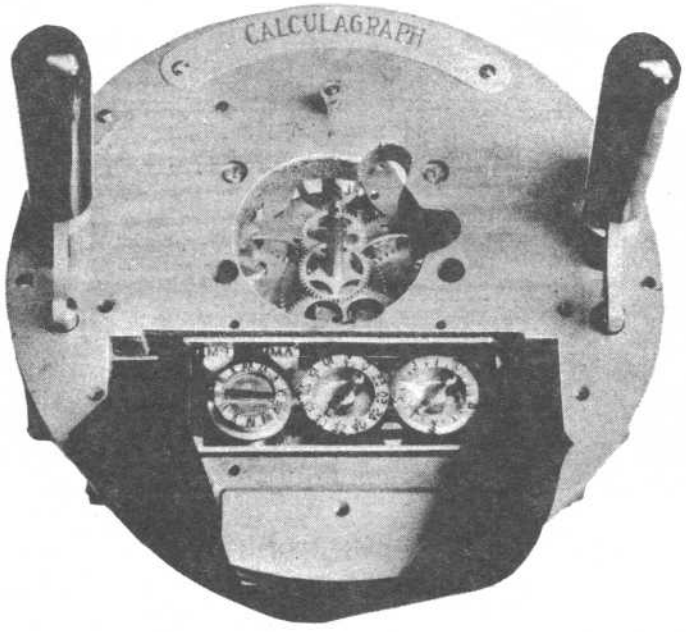


Figure 8 - MODEL 6 CALCULAGRAPH WITH PLATEN HOLDER
AND TICKET PLATE REMOVED EXPOSING PRINTING
CHARACTERS FOR CLEANING

Figure 9 - STARTING TO INSERT A TICKET

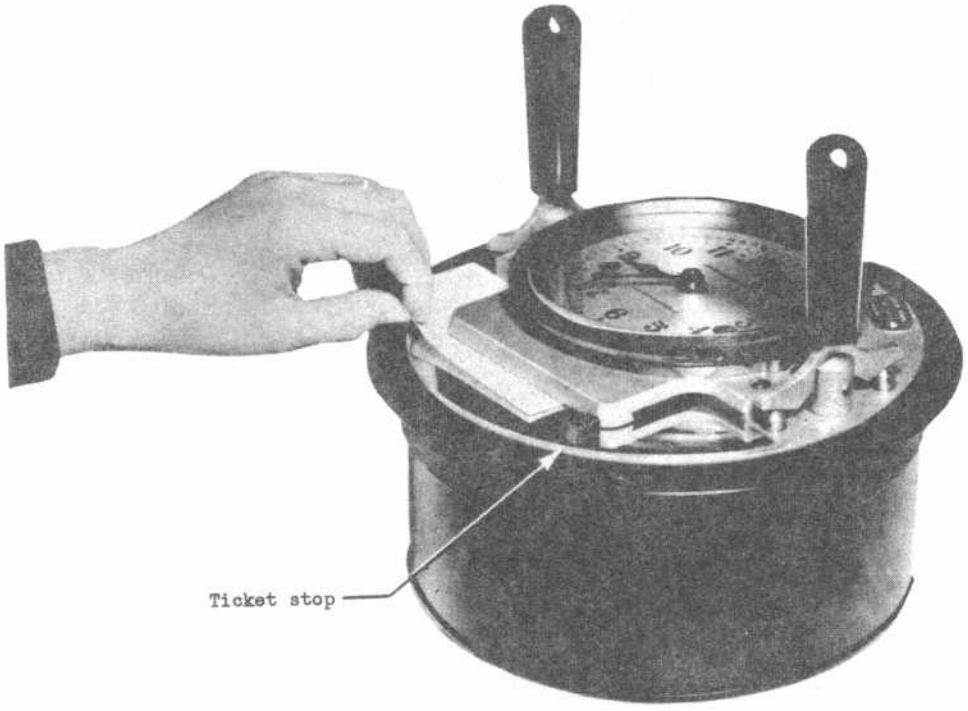
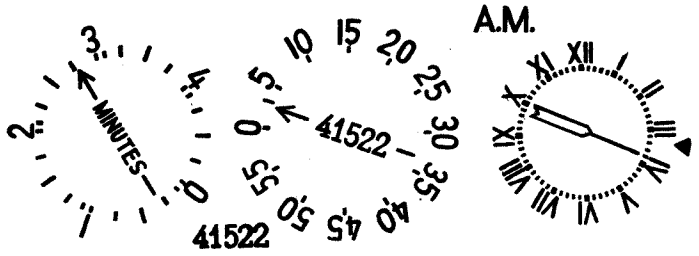


Figure 10 - TICKET INSERTED ALMOST TO THE TICKET STOP

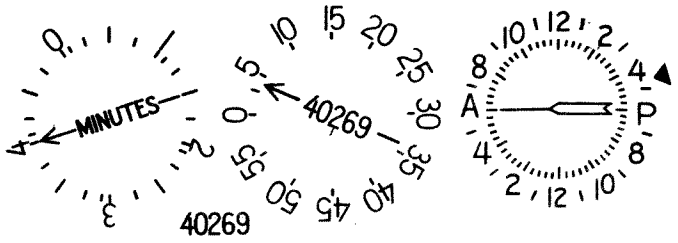


Imprint made by Model 6 Calculagraph with 12 hour time-of-day.

Elapsed time 2-3/4 minutes.

Record started at 3:19 A.M.

Figure 11



Imprint made by a Model 6 Calculagraph with 24 hour time-of-day.

Elapsed time 4 minutes.

Record started 4:45 P.M.

Figure 12