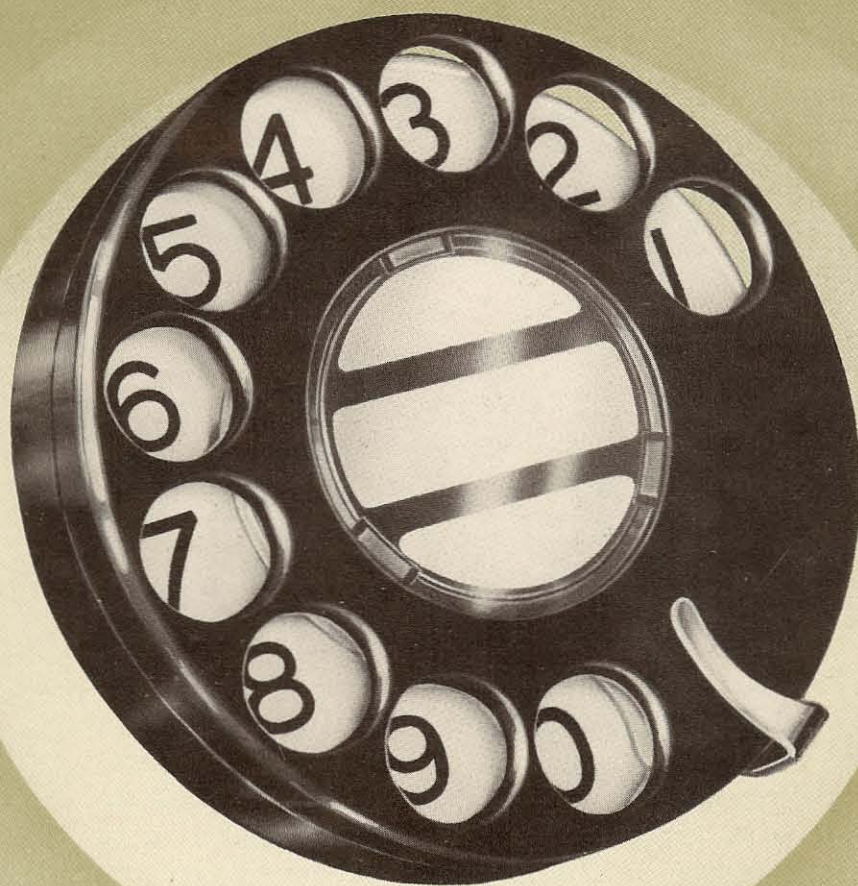
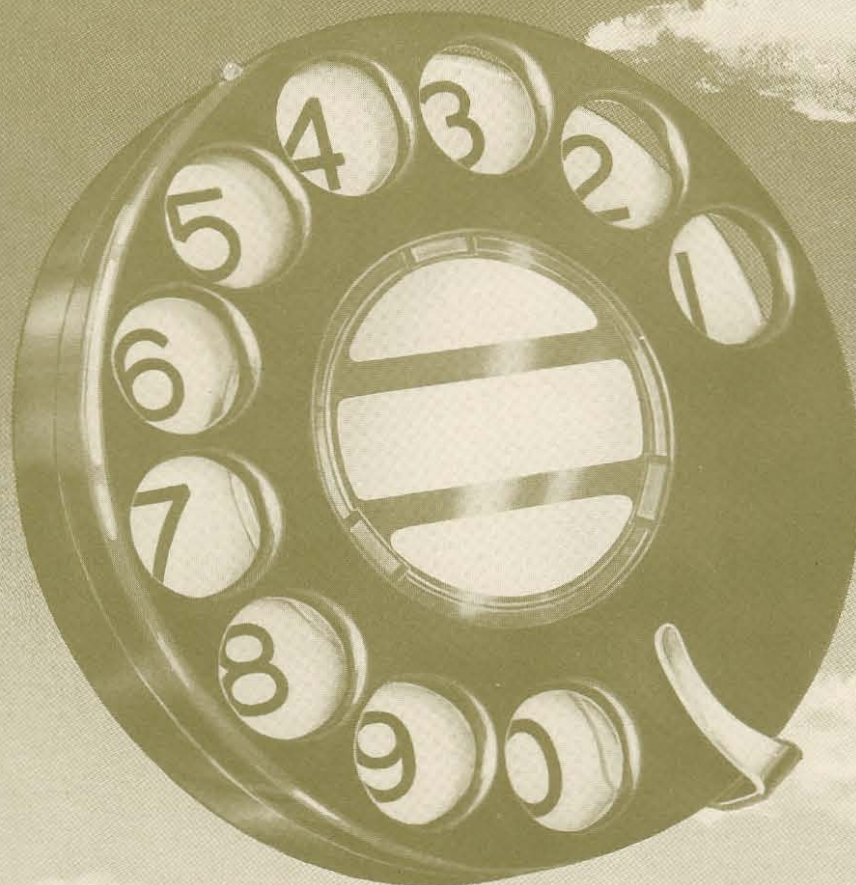


dials



by
STROMBERG-CARLSON



STROMBERG-CARLSON telephone dials have been in general use for several years. They have won the enthusiastic acclaim of subscribers and operating companies alike, for they are quiet, good looking and as dependable as a fine watch. This brochure describes the present series of dials which continue the Stromberg-Carlson tradition of constant research to merit the reputation,

There is Nothing Finer than a Stromberg-Carlson



FEATURES

The Stromberg-Carlson Telephone Dial reduces this mechanism to its simplest form. New principles of design have been used. Painsstaking care in production, and rigid inspection result in longer life, lowered maintenance cost, and complete subscriber satisfaction.

PROTECTION The dial mechanism is mounted on a rigid die cast aluminum housing and is encased in a transparent plastic cover. The moving parts are thus always in perfect alignment, and are protected from external dirt and grime.

ECONOMY The wind-up operation produces motion only in the main and secondary shafts, with the result that the other moving parts are in action for impulsing only. This feature insures quietness and decreases wear of vital elements.

QUIETNESS Quiet operation is further insured by using for the impulse cam drive two thin flat springs operating in conjunction with slots in their associated parts, a simple and dependable device that assures positive and uniform impulsing.

NEATNESS The number plate fits into the housing rim for smoother contour and tighter fit, yet it is easily changed by removing the finger plate and only one screw.

PRECISION The gears and other rotating parts are precision machined, or molded, to insure a smooth movement and to reduce wear.

SIMPLICITY The terminal arrangement is very simple. The terminal screws extend directly through the dust cover avoiding cable, soldered connections and terminal block, thereby simplifying maintenance.

EFFICIENCY All necessary field adjustments can be made without removing the dial from the subset. An opening in the dust cover (closed by a snap-on lid) gives ready access to the working parts. Speed adjustment, cleaning of contacts, etc., can now be done without disturbing any connections or mounting screws.

ADAPTABILITY The Stromberg-Carlson dial size is standard for use on any American made telephone. With the terminals outside the plastic dust cover, connections for any telephone can be made quickly and easily.



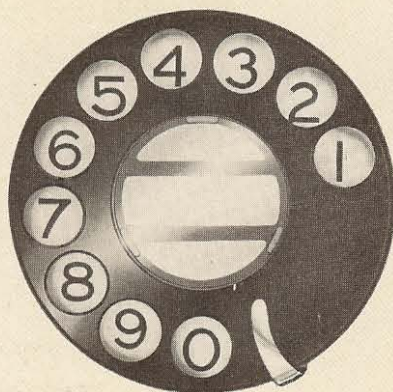
THE STROMBERG-CARLSON TELEPHONE *dial*

C O N S T R U C T I O N and M A I N T E N A N C E

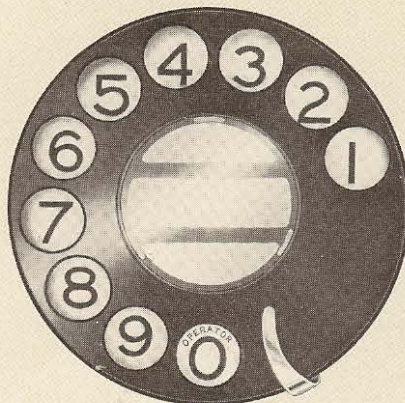
GENERAL The mechanism of the dial is mounted on the die-cast front (11), and the bridge (25), which provides bearings for the pinion and main shafts, is attached to three posts on this front. In order to exclude dust from the working parts, a clear plastic dust cover (48), completely encloses the rear of the dial. Connections to the shunt and impulse springs are made directly through the terminal screws (50) appearing on the back of the dial.

NUMBERPLATES (10) There are three standard numberplate designs as shown below. These are offered in aluminum colored vinylite as a durable, non-glare background for the letters and numbers. All number plates are completely interchangeable.

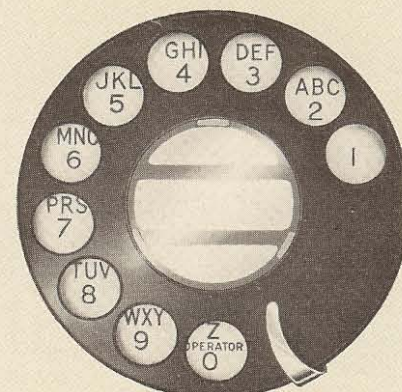
The numberplates are fastened with two tabs, which fit into recesses in the front, and with one screw (7) which also fastens the finger stop (9). The tabs do not require bending and the numberplate is easily accessible from the front.



Number Plate 4



Number Plate 5



Number Plate 6

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FINGERPLATE The stamped metal fingerplate (6) is finished in black enamel.

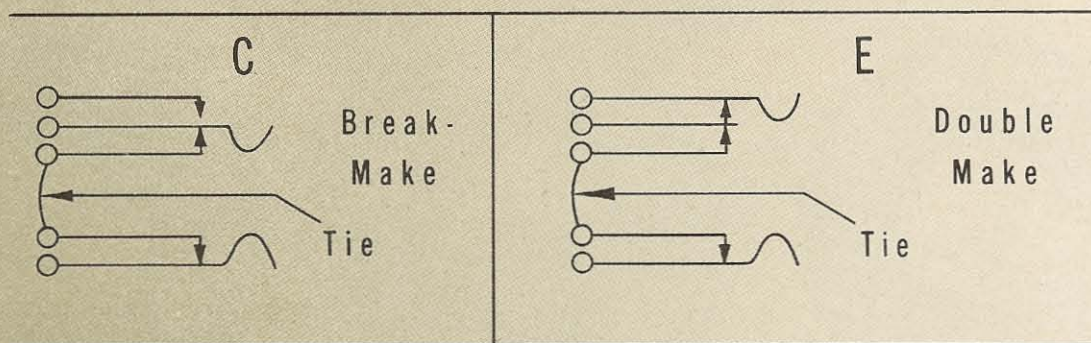
STATION NUMBER CARD The station number card (2) provides space for the station number and is protected by a clear plastic holder (1). The method of removing the holder is not readily apparent and this feature should discourage tampering by unauthorized persons. The holder is retained in place by a spring (5) which engages three projections on the holder. The location of the station number card is controlled by means of three notches, 120° apart on the periphery, which fit around the legs, or projections of the holder. To assemble, place the card in proper position and press the holder until it is "home," at which point it will be flush with the fingerplate.

A small thin-bladed screw driver or similar instrument can be used to remove the holder by levering between the fingerplate and the numberplate at the three points which locate the legs of the holder. These three points are opposite digit 8 finger hole, between the finger holes of digits 3 and 4, and midway between the digit 1 finger hole and the finger stop (9). Each leg, in turn, should be moved an equal amount until the holder is projecting above the fingerplate a sufficient distance to allow gripping with the fingers to complete its removal.

FINGER STOP The finger stop is held by means of one screw and positioned by its interlocking end. It is easily replaced or tightened from the front without removing any other parts. The clearance between the finger stop and the fingerplate must be checked to see that there is no binding interference. Check by dialing digit "O" which will give a full sweep of the fingerplate.

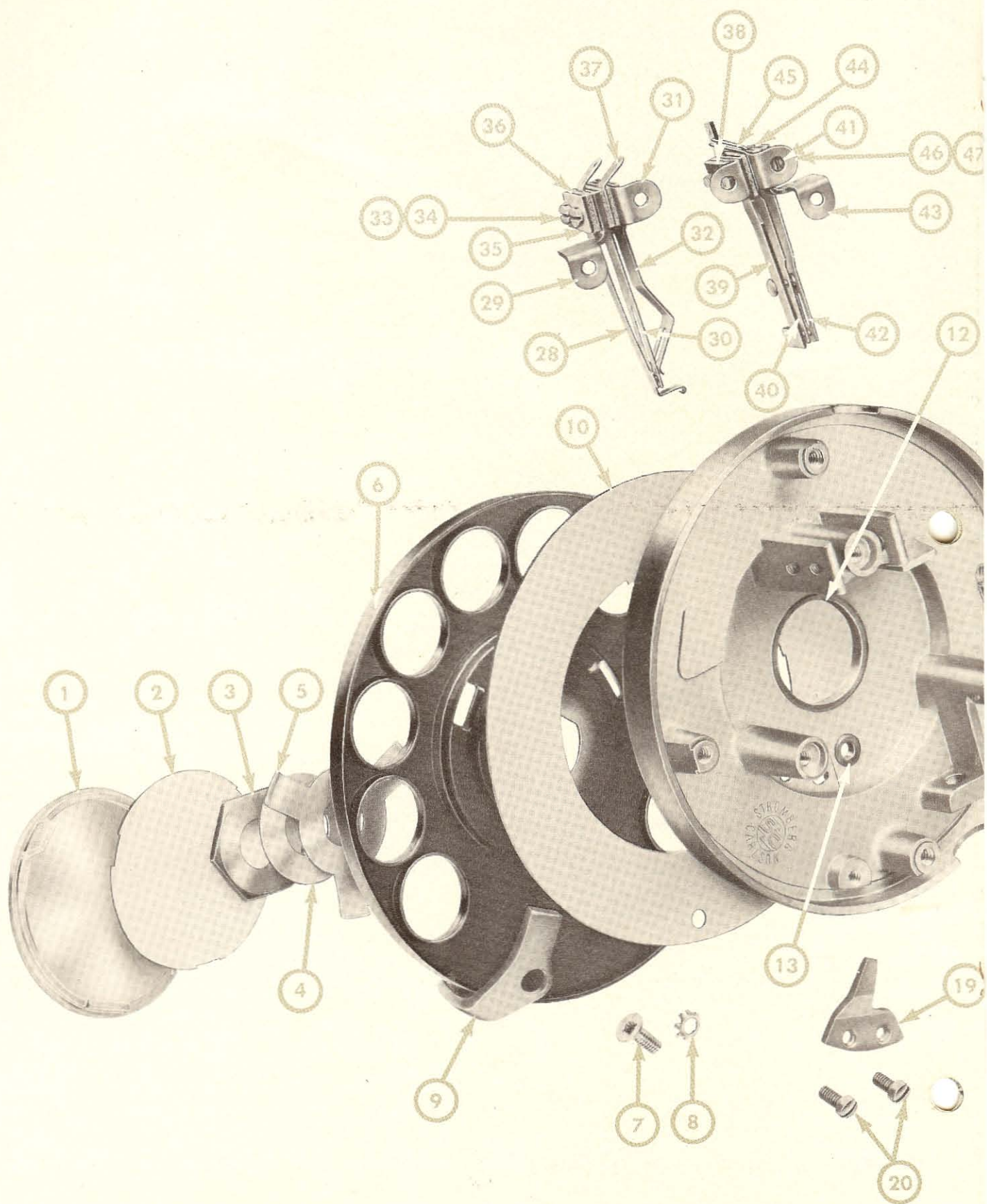
OFF-NORMAL (SHUNT) SPRING GROUP (38-47) The type CE dial has two sets of break contacts, normally open. The springs are mounted on a lug behind the governor cup by means of two screws (33). Contact separation should be .015" minimum and contact pressures should lie between 25 and 35 grams. While checking the contact pressure, hold the fingerplate off normal so that contacts are made.

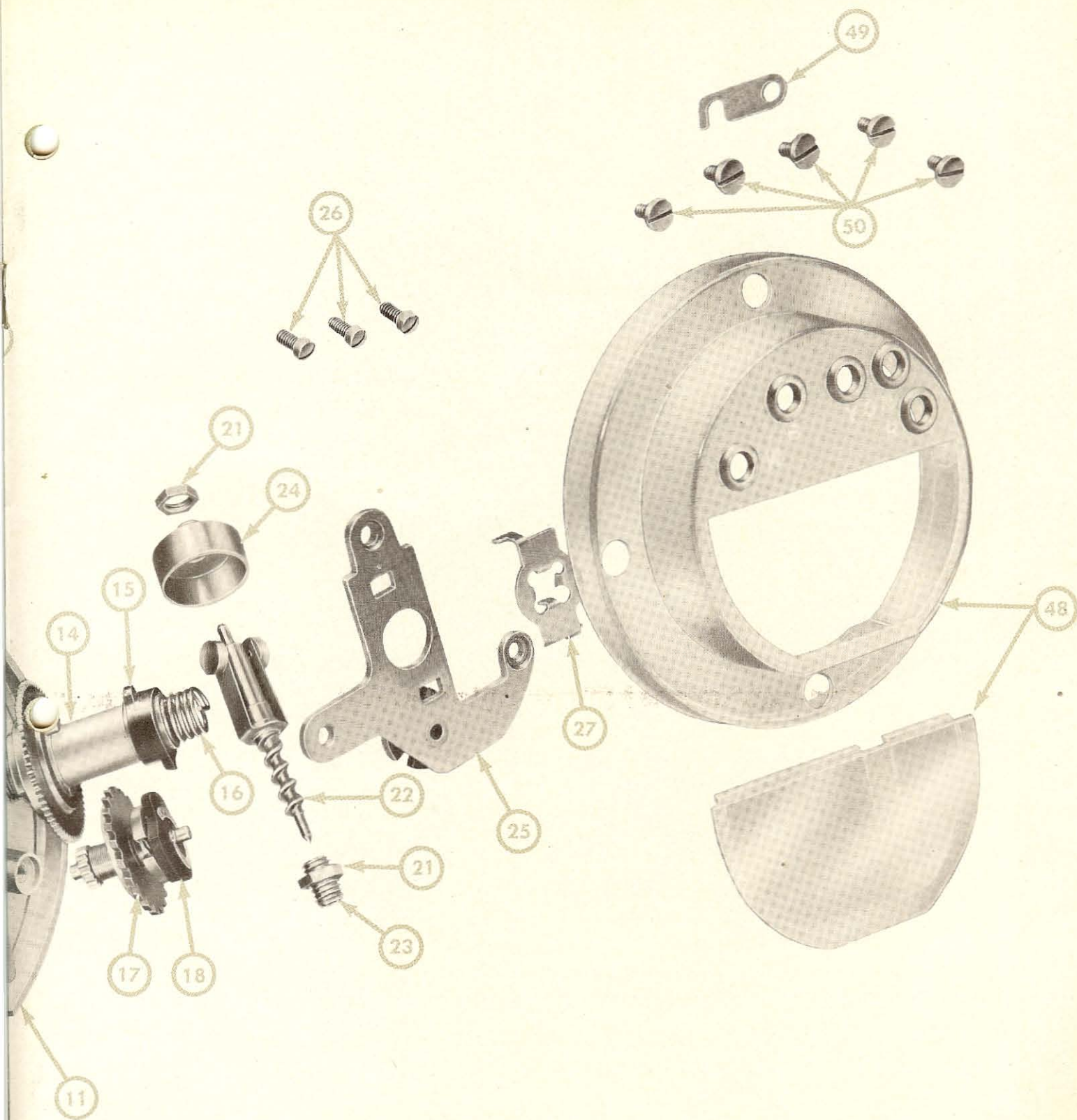
The "C" and "E" spring combination shown below are standard.
All others not shown are special.



CX Same as "C" without Tie

EX Same as "E" without Tie





DUST COVER The clear plastic dust cover (48) is attached to the dial by the terminal screws. (50). The holes in the cover must be located on the bosses on the posts so as to assure that the dial will be seated properly in the telephone. A connector (49) is provided which connects shunt and impulse springs and is easily removed to suit circuit conditions.

IMPULSE SPRINGS The impulse spring group (28-37) is mounted in the same manner as the shunt spring group but on the opposite side of the mounting post. When the finger-plate is held "off normal" the contact pressures are to be between 28 and 33 grams including "follow" and when the dial is pulsed there should be a minimum contact separation of .015". Apart from minor adjustments to these springs, they should not be tampered with as the impulse ratio may be changed.

MAIN SPRING The helical-wound main spring (16) which provides the driving power is completely enclosed within the main shaft. The lower end of the spring is engaged in a hole at the bottom of the main shaft cavity where it is secured by bending over the protruding portion of the spring. The other end of the spring is engaged by two of four hooks on the underside of the anchor. The proper tension is approximately one and one-half turns. There are four of those hooks spaced at ninety degrees apart thus permitting an adjustment to the nearest quarter turn. The spring is disengaged by inserting a screw driver blade of the proper width through the hole in the top of the anchor along side the straight end of the spring and turning slightly in a clockwise direction until the two anchor lugs are disengaged from the small rectangular slots in the bridge. Upon assembly, after obtaining the desired tension, lock the anchor securely in its home position.

GOVERNOR The normal operating speed and factory adjustment of the dial is 10 impulses per second plus or minus one-half impulse, but due to the impossibility of maintaining this speed over a long period of time a minimum of 8 impulses per second and a maximum of 12 impulses per second are allowable.

To regulate the speed of the dial, adjust the springs of the governor (22) to decrease or to increase the friction of the weights on the inside surface of the cup (24). A slight spreading of the springs will reduce speed; bringing both arms closer to the worm will increase the speed. Form the governor springs as nearly alike as possible. There should be perceptible end-play in the governor worm shaft but this end-play should not exceed .010". The governor must be completely free-running without the slightest drag. The end-play can be regulated by loosening the lock nut (21) over the screw thread at the tail bearing (23) and, by turning with a screw driver, increase or decrease the play. The lock nut at both the tail bearing end and at the governor cup end of the worm shaft must be firmly tightened.

PINION SHAFT ASSEMBLY The pinion shaft assembly consists of a one-piece pinion gear and shaft (17), worm wheel, ratchet, impulse cam assembly (18), and spring clutch. The whole assembly is driven directly by the main gear, the worm wheel drives the worm and the governor, while the bakelite impulse cam pulses the impulse springs. While the dial is being wound up, the spring clutch prevents turning of the worm wheel and governor, while one of the springs of the cam assembly prevents the turning of the impulse cam on the windup.

NUMERICAL LIST OF IMPORTANT PARTS

<i>Part Name</i>	<i>Item No.</i>	<i>Part No.</i>	<i>Part Name</i>	<i>Item No.</i>	<i>Part No.</i>
Card Holder	1	49772	Screw	26	501213
Station Number Card No. 4	2	205096	Anchor	27	203602
Nut	3	49814	Impulse Spring Group		
Washer	4	200568	Impulse Spring Assembly	28	49820
Spring Retainer	5	49811	Terminal	29	204332
Finger Plate Package Assembly	6*	205138	Impulse Spring Assembly	30	49838
Screw	7	202067	Terminal	31	204330
Lock Washer	8	202070	Tension Spring	32	49823
Finger Stop	9	202031	Screw	33	501463
Number Plate	10		Bushing	34	12538
Type No. 4		202053	Screw Plate	35	49833
Type No. 5		202054	Insulation—.031" thick	36	49841
Type No. 6		202055	Insulation—.015" thick	37	200713
Front	11	49776	Off-Normal Spring Group		
Bearing	12	49779	Terminal	38	204330
Front Bearing	13	49804	Back Spring Assembly	39	200698
Power Shaft Sub-Assembly	14	203621	Off-Normal Spring Assembly	40	49829
Combination Cam	15	203603	Terminal	41	204330
Motor Spring	16	203605	Off-Normal Spring Assembly	42	49828
Pinion Shaft Assembly	17	201888	Terminal	43	204331
Impulse Cam Assembly	18	204242	Insulation—.031" thick	44	49841
Internal Stop	19	202653	Insulation—.015" thick	45	200713
Screw	20	501063	Bushing	46	12536
Nut	21	8927	Screw	47	501563
Worm Shaft Assembly	22	49784	Cover Assembly	48	204334
Worm Shaft Bearing	23	49783	Connector	49	204333
Cup and Bearing Assembly	24	49780	Screw	50	502123
Bridge and Bearing Assembly	25	203620			

*205138 Package Assembly, to be ordered for replacements, includes 202247 Finger Plate and 202248 Spacer.

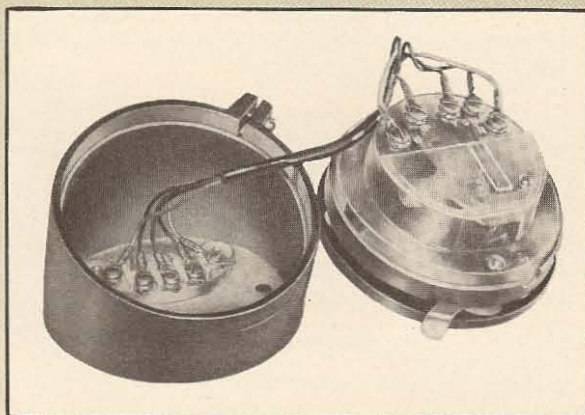
S WITCHBOARD DIAL MOUNTING ASSEMBLY

FOR MOUNTING A STROMBERG-CARLSON DIAL ON SWITCHBOARDS

The simple screw operated clamp plus the cable connection enable this dial mounting to accomodate all standard dials. The mount can also, without any changes, be placed in either the horizontal or vertical plane.

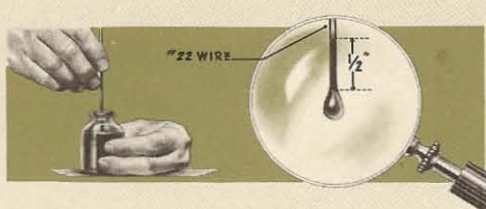
The Stromberg-Carlson Dial Mounting is very simple, small in size, light in weight, and furnished in an attractive black wrinkle finish.

When ordering specify 204843, No. 2 Switchboard Dial Mounting Assembly.



L U B R I C A T I O N

The points of the dial which will need lubrication, should the dial become sluggish, are given below. The oil used for this purpose is a very special product; no ordinary lubricants should ever be used on the dial mechanism. Stromberg-Carlson Dial Lubricant, part No. 202,239, is used for this purpose. The following listed bearing surfaces are to be lubricated. One drop of oil is to be applied at each point; a drop of oil being the amount that adheres to a piece of 22 gauge wire after being immersed in the oil to a depth of $\frac{1}{2}$ ".



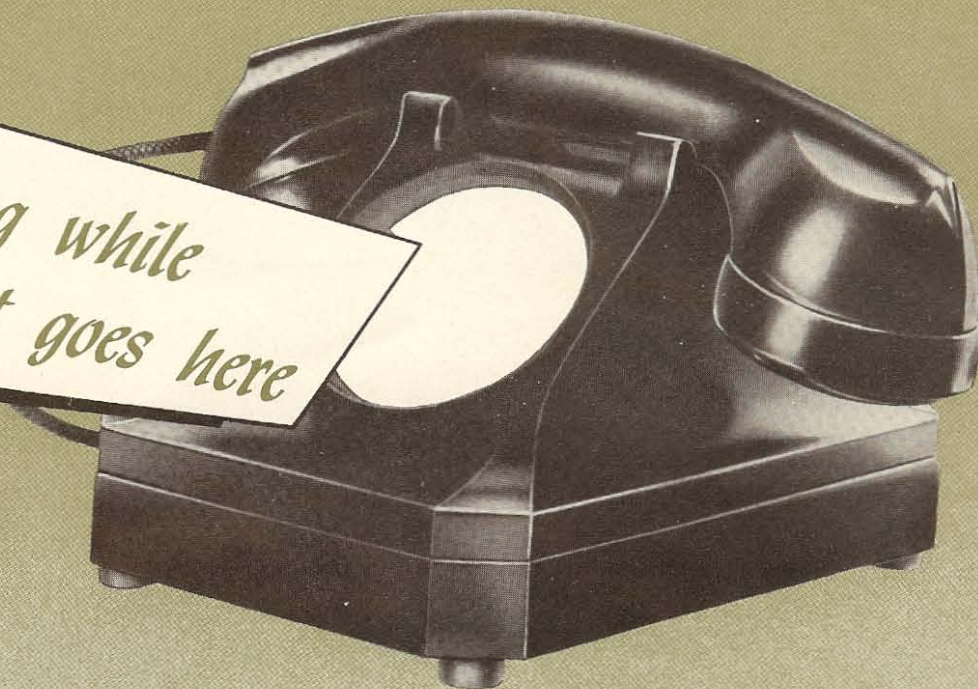
A. WORM SHAFT (22) Oil both the tail and governor cup bearings, (24) being careful not to let any oil get on the inside surface of the cup where the governor fly-balls make contact. Oil should also be applied to the worm where it contacts the worm wheel.

B. PINION SHAFT (17) Oil both bearings, one in the bridge (25) and the other at the lower end of the pinion shaft. Distribute a drop evenly on the outside of the spring clutch.

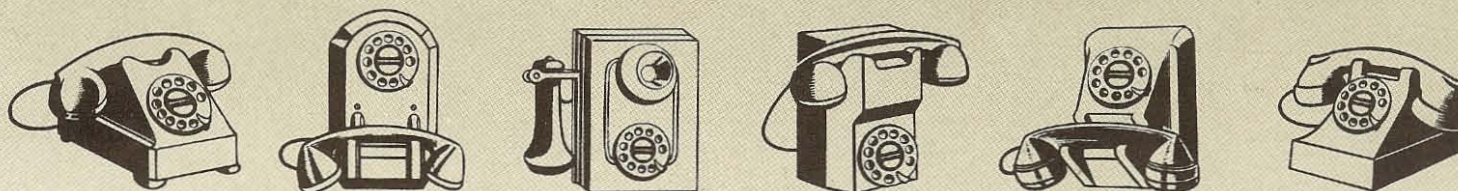
C. MAIN SHAFT (14) To oil the main power shaft properly, remove the anchor (27), and the fingerplate. Remove any dust around the bearing under the fingerplate before applying the oil. Distribute one drop evenly on the inside of the motor spring (16). Put one drop where the main shaft fits into the bridge. Wipe off all excess oil.

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*You'll live a long while
with the dial that goes here*



STROMBERG-CARLSON DIALS MAY BE USED WITH ANY AMERICAN-MADE TELEPHONE



HOW TO ORDER

Dials are coded in order to make it easy to specify the proper dial to fit your requirements. The following information is necessary, and should be used as in the example below.

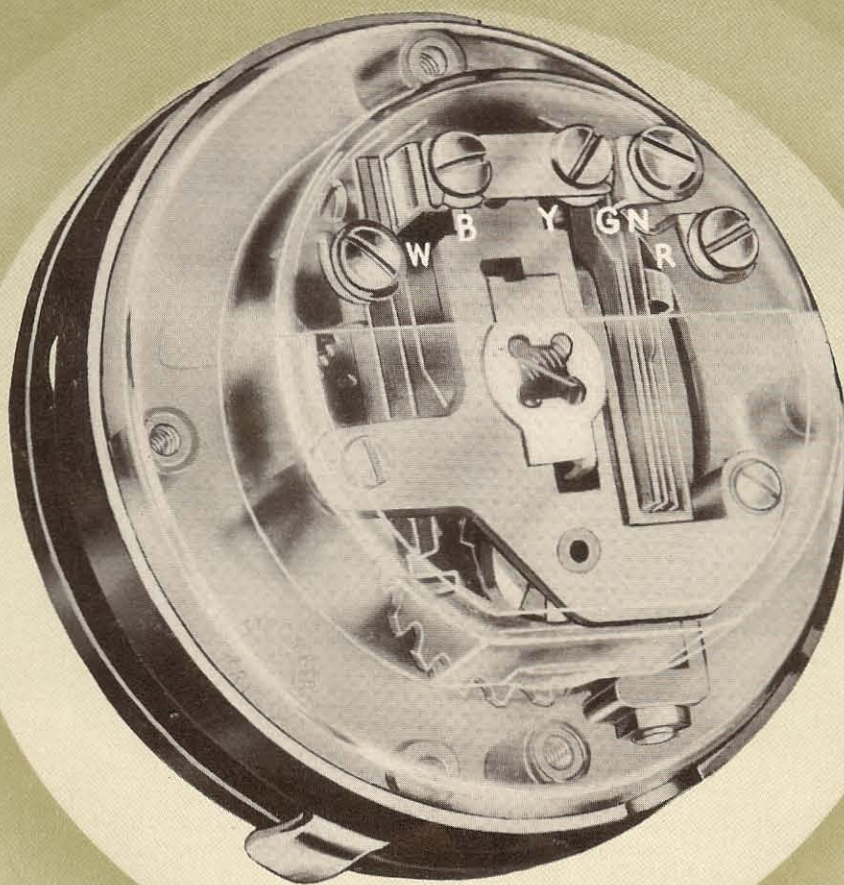
- First** character of code is the Series-letter of dial: "C" is the present series.
- Second** character of code denotes the spring combination wanted: "E" and "C" are illustrated.
- Third and Fourth** characters of code denote the finger plate: 20 for standard black enamel.
- Fifth** character of code denotes which of the three number plates illustrated above is desired.
- Following the dash, the
- Sixth** character denotes the number of conductors in the dial to sub-set cable: 4 conductors or 5.
- Seventh** character, "4," denotes the standard station card.

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STROMBERG-CARLSON

Factory, General Offices: Rochester 3, N. Y.

Branch Offices: Atlanta 3, Chicago 6, Kansas City 8, San Francisco 3. In Canada: Stromberg-Carlson Co. Ltd., Toronto



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