

AUTODIALS NOS. 1 AND 2

General Instructions

1. General. The Autodial is a device which enables automatic subscribers to call other subscribers with whom frequent communication is desired – without the necessity for remembering or dialling the numbers. To call a subscriber other than those catered for by the Autodial, the normal dial will be used.

2. The Autodial may be connected to an ordinary telephone circuit or to P.B.X.s of the undermentioned types:—

Switchboards CB 935 $\frac{1+3}{4}$, $\frac{2+4}{6}$ and $\frac{3+7}{12}$

Switchboards CB 873 and AT 1800 $\frac{3+10}{25}$ and $\frac{5+20}{25}$

in all automatic areas with the exception of the Siemens' No.5 exchange areas in the Southampton Area.

The Autodial is also suitable for use in connexion with any extension instrument which is provided with a dial. It should be noted, however, that where direct access to a public automatic system is provided from a P.A.B.X. extension, the ordinary dial must first be used to secure an exchange line, and, upon receipt of dialling tone, the required number obtained by the autodial.

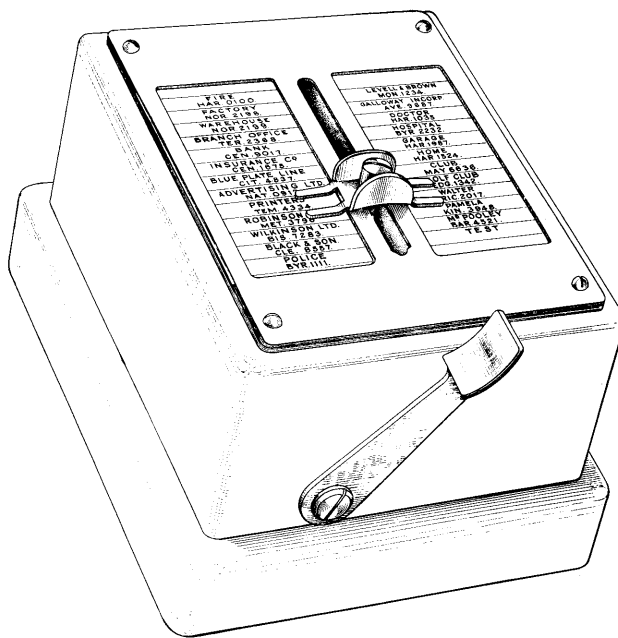


FIG. 1. GENERAL VIEW OF AUTODIAL NO. 1

3. The Autodial consists of a box unit, on top of which appears a list of the names and telephone numbers of the subscribers with whom the renter of the device chiefly communicates. When one of these subscribers is required, it is only necessary to move a sliding pointer to the appropriate name on the list and depress a lever on the front of the Autodial. The Autodial will then automatically dial the required number; the time taken in the transmission of pulses is necessarily similar to that of the normal dial.

*4. Autodials are no longer available for issue as replacements or as new instruments but should only be withdrawn from service when they require mechanical adjustment or repair. Then, a suitable explanation should be given to the subscriber and the Sales Divn. should be advised of the withdrawal date (T.S.I. B1 82 refers). Locally-held stocks of "Glasses No. 44 and No. 45", "Labels No. 219 and No. 220" and "Disks, Autodial, No. 1" should be reduced to a minimum, and surplus items returned to the Supplies Dept.

*5. When all Autodials have been withdrawn from service, all locally-held stocks of parts and all "Pliers, Autodial No. 1" should be returned to the Supplies Dept.

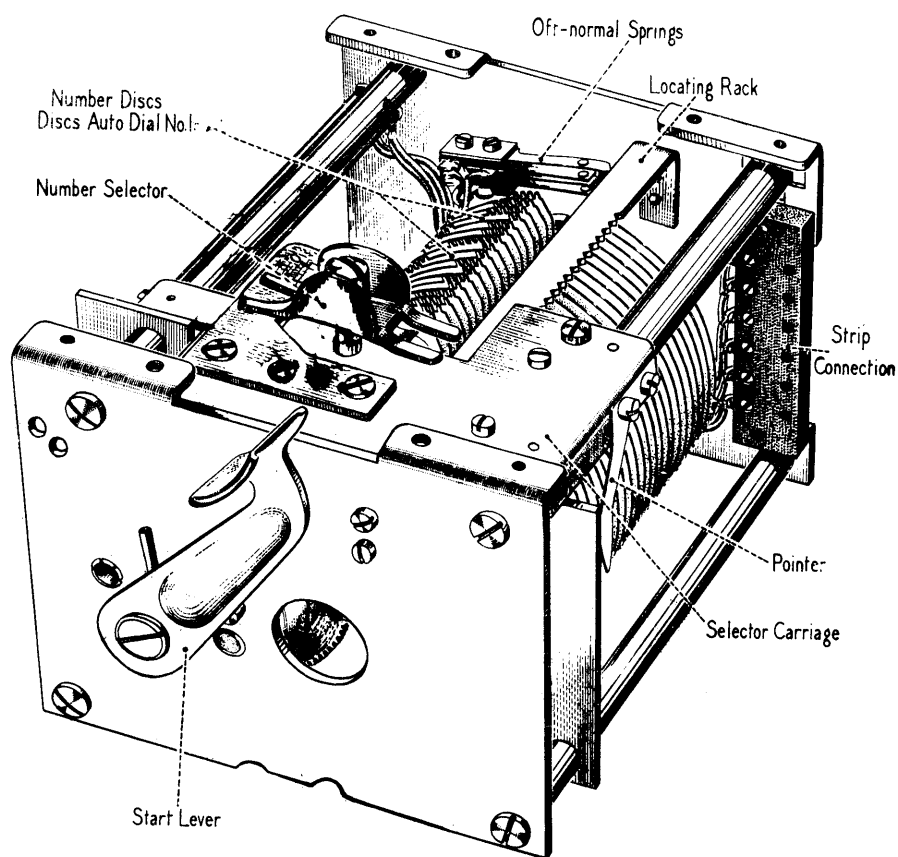


FIG. 2. MECHANISM OF AUTODIAL.

6. The diagrams for the two Autodials are as follows:—

Autodial Nos. 1 and 2 with Telephone No. 150	N 2300
" " " " " NO. 162	N 2301
" " " " " NO. 1/232 ...	N 2305
" " " " " NO. 332	N 2306

7. An illustration of the complete Autodial No. 1 is shown in Fig. 1. The Autodial No. 2 is similar in appearance, the width and depth being the same; it is, however, made longer to accommodate the larger number of disks.

8. **Description of the Autodial.** The complete mechanism of the Autodial is illustrated in Figs. 2 and 3.

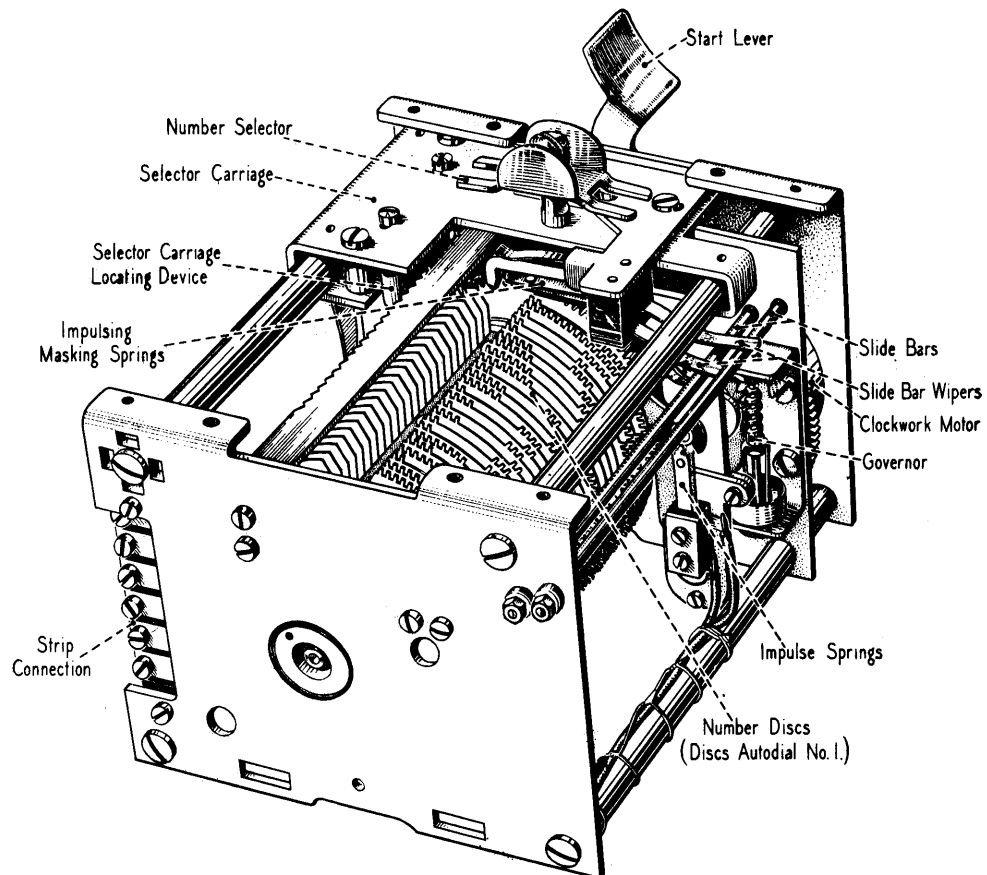


FIG. 3. MECHANISM OF AUTODIAL

9. The Autodial consists essentially of a number of castellated disks (25 or 50) mounted on a common spindle. Each disk, which has 120 castellations initially, is prepared, in the manner described later, so as to be capable of dialling a particular number. The prepared disk presents the appearance of a toothed wheel, having a series of sets of teeth, each set of teeth being separated by a space corresponding to an inter-digit pause, and the number of teeth in each set being equal to the number of impulses required for each digit. If, for instance, the number NAT. 6321 is concerned, the disk would first have six teeth corresponding to the digit N, then a space where eight teeth have been removed to provide an inter-digit pause of approximately 800 milliseconds, followed by two teeth corresponding to the digit A, then another space, and so on (see also Fig. 4).

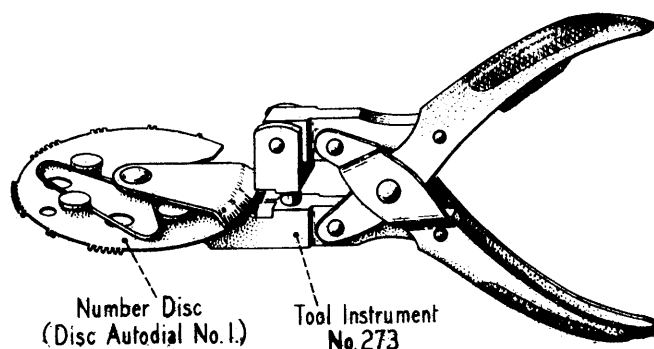


FIG. 4. TOOL, INSTRUMENT NO. 273

10. A clockwork motor is provided to revolve the drum of disks. The speed of the drum is reduced by a train of gears and is controlled by a governor similar to that provided on the standard dial. The drum makes one complete revolution in approximately 12 seconds. The clockwork motor is controlled by a start lever on the front of the case. Depression of the lever to the fullest extent, tensions the main spring of the clockwork motor sufficiently to drive the drum one revolution. Upon the release of the lever, the drum of disks is driven one complete revolution and the lever slowly returns to its normal position.

11. The number selecting device is in the form of a sliding carriage, termed the Selector Carriage which may be moved longitudinally over the drum. The selector carriage, on its upper side, carries a pointer which frames the name on the label of the wanted subscriber. On the underside of the selector carriage is carried the impulse-masking springs (see also Fig. 7), which ride on the appropriate disk as indicated by the pointer. By means of a pawl working in a rack, (see also Fig. 9), it is ensured that the selector carriage will not stay in an intermediate position.

12. The impulse-masking springs, when riding on the teeth of the disk, are normally open. When a space on the disk is passing the impulse-masking springs, however, the latter close and short-circuit the impulsing springs which are in parallel.

13. The impulse mechanism (see also Fig. 5) is in the form of a butterfly of insulated material, revolving between two contact springs. These springs impulse continuously during the rotation of the disks.

14. Off-normal springs (see also Fig. 7), which serve the same function as those on the standard dial, operate immediately the Autodial moves off-normal, and remain operated until the Autodial again comes to rest.

15. **New Installations.** An Advice Note will be issued to cover the installation of each new Autodial.

16. A schedule of the telephone numbers which the subscriber requires setting up, and the position each number is to occupy on the Autodial, will be furnished by the T.M. This schedule will accompany the Advice Note.

17. Two labels are required on each Autodial to indicate the position of the various numbers. The labels will be known as:-

Label No. 219 (for Autodial No. 1), and
Label No. 220 (for Autodial No. 2)

These labels are reversible and may be used for either the left- or right-hand side of the Autodial by reversing the label. The labels are maintained in the correct position in relation to the corresponding numbers by means of locating lugs on the frame of the Autodial. The name and telephone number of each subscriber to be set on the Autodial will be neatly drawn on the label by the T.M. and the labels will be forwarded to the Area Engr. with the Advice Note.

18. The disks, which will be known as "Disks, Autodial No.1" should be cut at the Fitting centre and the complete instrument tested out before being taken to the subscriber's premises.

19. To test-out the Autodial, it should be connected to an ordinary exchange line and a working test made through the exchange equipment.

20. The disks should be extracted by means of "Tools, Instrument No.272", which has been provided for the purpose. The disks may, however, be readily extracted by taper-nosed pliers, if the latter tool is used, care should be taken not to injure the disk.

21. **Cutting the disk.** "Tool, Instrument No.273" is provided for cutting the disks. The method, illustrated in Fig.4, is as follows.

22. The disk is inserted in the "Tool, Instrument No.273" in the manner shown i.e., with the disk retaining spring uppermost. Commencing from the slot, the disk is rotated in a clockwise direction and the first four teeth are cut off. This is necessary in all cases, irrespective of the telephone number, to ensure that the off-normal springs adequately guard against clicks throughout the range of adjustment of the impulse-masking springs.

23. Proceeding to cut the number, the disk is rotated until the first tooth past the cut stands opposite the number on the gauge corresponding to the last digit. If, for instance, the number NAT.6321 is to be cut, then the first tooth will stand against the normal 1 on the gauge. By operating the "Tool, Instrument No.273", eight teeth are then cut off the disk, forming an inter-digit pause of 800 milliseconds. The disk is then rotated until the first tooth past the cut stands against the numeral on the gauge corresponding to the last digit but one - in the telephone number taken as an example, this will be the numeral 2 - and a second series of eight teeth are cut off forming the second inter-digit pause. The remaining digits are set up in a similar manner preceeding always from the last digit backwards in the correct order, to the first digit and an inter-digit pause of 800 milliseconds being cut out between each.

24. All the teeth remaining after the last digit has been cut, should be cut off. The finished disk will present the appearance of a toothed wheel having a series of sets of teeth. Each set of teeth will be separated by a space equivalent to eight teeth where teeth have been cut off, and the number of teeth in each set will be equivalent to the number of the digit it is required to dial. The illustration in Fig.4 shows the number of the digit it is required to dial. The illustration in Fig.4 shows the number NAT.6321 already cut and the spare teeth at the end being cut off.

25. The necessity for cutting the number at the end of the travel of the disk - rather than at the beginning - is to ensure that in the case of a telephone number made up of a series of trains, comprising in the aggregate a small number of impulses, there is no risk of the called subscriber answering before the off-normal springs have restored.

26. **Test disks.** One disk is required to enable the speed of the autodial to be checked. This disk should be cut in the following manner. Commencing from the slot and rotating the disk in a clockwise direction, cut out 10 teeth; leave 10 teeth; cut out 40 teeth; leave 10 teeth; cut out 40 teeth; leaving the remaining 10 teeth. This disk will therefore send out three trains of ten impulses, with a pause of approximately four seconds between each.

27. The test disk should be fitted in position 24 in the case of "Autodial No.1", and position 49 in the case of "Autodial No.2". The position of this disk will be indicated on the label by the word TEST.

28. **Instruction Card.** One Card A 956 "How to use the Autodial" should be supplied with each autodial fitted.

29. Alterations and Additions. Alterations or additions to the numbers set up on the autodial may from time to time be required by the subscriber. New disks will also be required in cases where the number of a subscriber appearing on the autodial is changed, i.e., cases of change of number consequent upon an Area correction transfer.

30. Alterations and additions will be carried out under an open Advice Note, covering all such changes in any one month. A separate Advice Note will be issued monthly to each Area Engr. in whose area the Autodial is fitted.

31. The T.M. will forward to the Area Engr. a separate mimeographed slip in respect of each change. The slip will detail the precise nature of the alteration or addition required.

32. The T.M. will also prepare new "Labels No.219 or 220", as the case may be, and forward them to the Area Engr. with a slip requesting the change.

33. The new disk or disks, according to the requirements stated on the mimeographed slip, will be prepared and tested out in the Fitting centre before being fitted on the autodial at the subscriber's premises.

34. The fitting of the disks on the autodial at the subscriber's premises should, as far as possible, be carried out at the same time as the visit is made to that subscriber or to another subscriber in the vicinity.

35. Care should be taken to ensure that the exchange supervisor is advised of any calls made over the subscriber's line when testing out new discs, in order that the subscriber's account can be credited accordingly.

***36. Adjustment particulars.** Mechanical adjustments to the Autodial should not be carried out in situ. When an Autodial is found to require mechanical adjustments it should be forwarded to the Supplies Dept. under the normal maintenance exchange procedure. The "Disks, Autodial No.1" and "Labels No.219 or 220" should be retained and fitted to the new autodial. The disks removed from the new autodial should be fitted to the faulty item which should be sent back to the Supplies Dept.

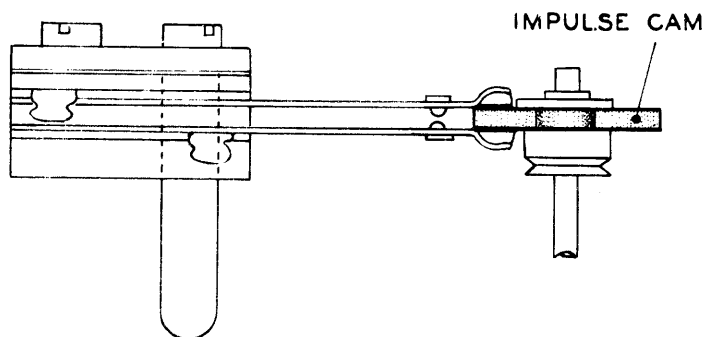


FIG. 5. IMPULSE SPRING ASSEMBLY

37. Impulsing Springs (see Fig.5).

Contact Pressure 30 grammes minimum, 40 grammes maximum.

Contact Clearance 10 mils minimum. This is determined by the thickness of the insulated butterfly-type impulse cam.

38. *Impulse-Masking Springs.* (see Fig.6). With the impulse-masking pawl resting on the top of a castellation, the contact clearance should be 15 mils. The contact pressure, which should be adjusted by tensioning the pawl tension spring, should be 35 grammes minimum and 45 grammes maximum.

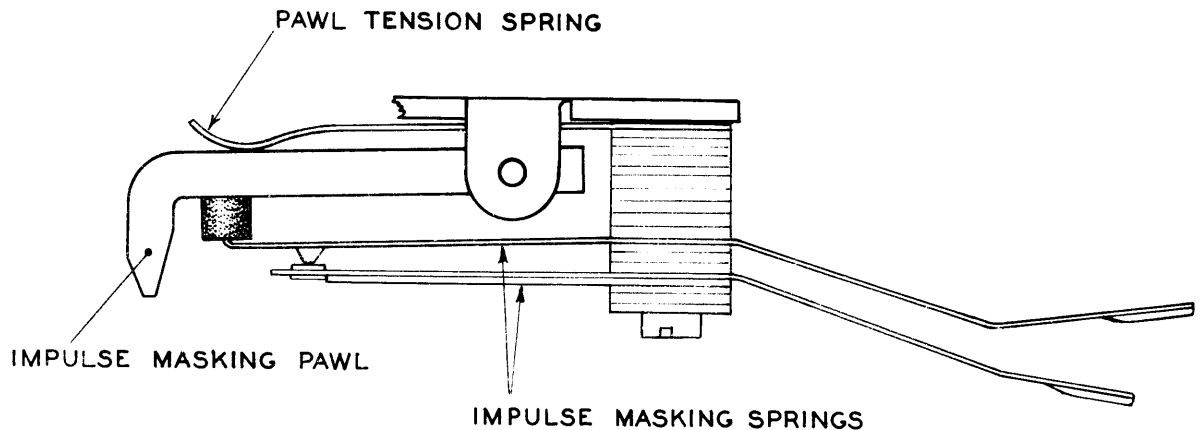


FIG. 6. IMPULSE-MASKING SPRINGS

39. With the pawl tension spring deflected to remove its pressure from the pawl, the upper contact spring should be approximately parallel with the lower. The lower contact spring should initially be tensioned against the buffer spring situated beneath it. If adjusted within these limits, the impulse-masking pawl should not make contact with the portions of the disk where the castellations have been removed.

40. If this should be found to occur, it may be that in cutting the disk, too little of the castellations had been removed. In this case the difficulty should be corrected by removing the remaining portions of the cut castellations.

41. *Off-normal springs.* (see Fig.7).

Contact pressure 20 grammes minimum, 30 grammes maximum.

Contact clearance. In order to reduce the click in the receiver to a minimum when the off-normal springs are operated, it is essential that the upper pair of springs should make before, and break after, the lower pair. With the lever spring on the operating stud, the clearance between the upper pair of springs should be 10 mils, with the lever spring off the operating stud and the upper springs just breaking; the clearance between the lower pair of springs should be 15 mils.

42. *Slide-Bar Wipers.* (see Fig.8).

Contact pressure 30 grammes minimum, 50 grammes maximum.

These wipers are best adjusted by removing the complete spring assembly "setting" the wipers to increase the pressure and removing any excess pressure when the assembly is replaced.

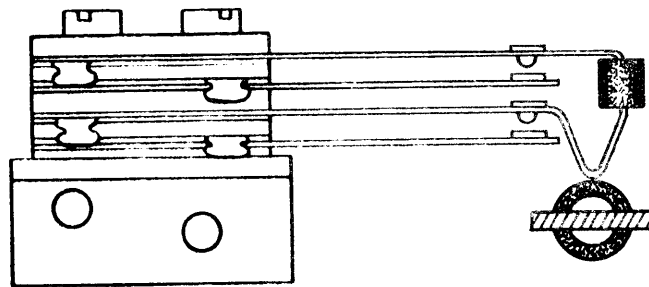


FIG. 7. OFF-NORMAL SPRING ASSEMBLY

43. *Adjustment of Phase Relationship between Impulsing Springs and Impulse-Masking Springs.* It is important that correct relationship between the two sets of springs should be effected, otherwise clipped or false impulses will result.

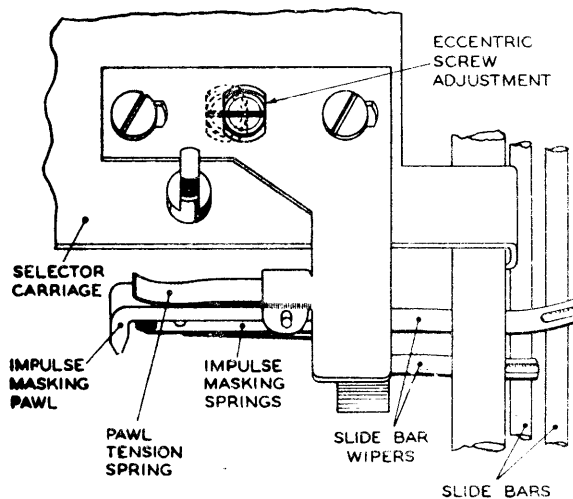


FIG. 8. SLIDE-BAR WIPERS

44. The masking springs should break during the closure of the impulsing springs, prior to the first break of the digit train, and re-make during the closure of the impulsing springs, immediately after the last break of the digit train.

45. The phase relationship between the two sets of springs can be adjusted by varying the position of the bracket to which the impulse-masking spring assembly is secured. This adjustment is carried out by loosening the locking screws and rotating the eccentric screw (see Fig. 8) which provides for fine or micrometer adjustment. To ensure that the backlash in the gear train does not produce ambiguous results, the start lever should be fully depressed and the motion of the disks restrained by the while carrying out this adjustment.

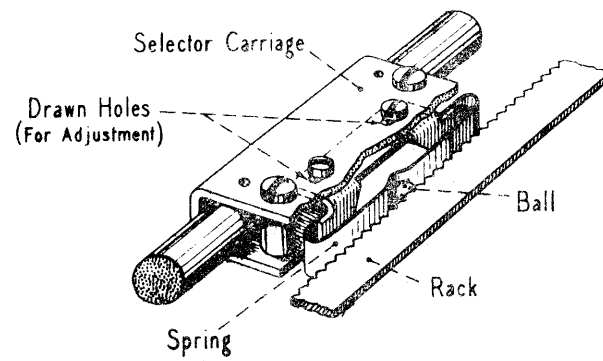


FIG. 9. SELECTOR CARRIAGE-LOCATING DEVICE

46. Selector Carriage-Locating Device (see Fig.9).

Correct location of the impulse-masking spring assembly over the relevant disk is afforded by means of a small steel ball working in a rack. The ball is maintained in compression against the rack by means of a flat, steel spring. The steel spring should be tensioned sufficiently to ensure that the sliding carriage will not stay in an intermediate position, but not so heavily tensioned as to make movement of the pointer too stiff. The flat, steel spring is mounted on a short length of angle metal which, being secured to the sliding carriage by two screws through drawn holes, provides a means of adjustment of the sliding carriage in relation to the rack.

47. Speed of Autodial. The speed of the autodial can be varied by adjusting the wings of the governor. The wings should be bent from the root only, using "Tool, Instrument No.90 or 104" as illustrated in Fig. 10.

To increase the speed, bend the wings inwards.

To decrease the speed, bend the wings outwards.

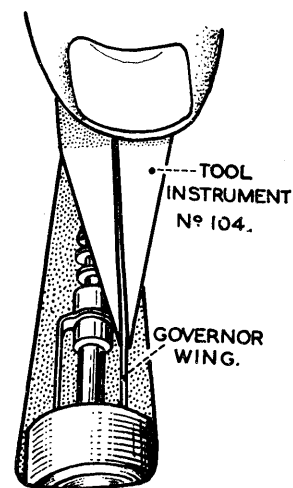


FIG. 10. GOVERNOR ADJUSTMENT

Reference:— None

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