

# PERMAREC



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**T**HERE have been many attempts to produce a permanent, flexible, home-recording record for use on a standard gramophone or radio-gram.

In all cases these productions have failed to achieve their object for one or more of the following reasons :

- (a) Inferior reproduction with metal records using soft or trailing needles.
- (b) Metal records which have to be re-made from metal matrix or pattern. This system is not only expensive and lengthy, but also renders quick recording in the home impossible.
- (c) Short life of metal records when used as recorded without further processing.

Musikon Limited, who for the past four years have been designing and producing sound recording and reproduction apparatus, and indeed have equipped many cinemas and theatres throughout the country, are now able to supply the Permaret flexible, unbreakable, home-recording permanent record, which has the following remarkable properties and advantages :

- (a) Can be recorded and permanently hardened for use within three hours.
- (b) Can be played on any standard gramophone or radio-gram with steel needles.
- (c) Reproduction is equal to any standard proprietary record.
- (d) Has the playing life of any standard record.
- (e) The record, consisting of a metal base, with pigment covering can be bent and dropped without fear of breakage.
- (f) The record is 10 in. in diameter and gives three minutes running either side and weighs two and one-quarter ounces, against six ounces, the weight of a standard record. Three of these records take up the space of only one standard record.
- (g) Can be recorded by anyone, with excellent results, on a radio-gramophone with the small additional expense of a microphone, a groove-cutter and recorder.

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## APPLICATIONS OF THE "PERMAREC" RECORD.

- (a) The home-recording of special items from the wireless programmes.
- (b) The home-recording of speech and music by members of the family.
- (c) The home-recording of special greetings, and letters, to be sent to friends and relations abroad.
- (d) The adding of sales talks, in any language, to new or old advertising sub-standard films.
- (e) The recording of educational lectures and talks.
- (f) The recording of pupils progress, in music and language schools.
- (g) The amateur recording of speech and music, etc., synchronised and arranged as a running commentary to films already taken with 16 or 9.5 m/m Cine Cameras.
- (h) The amateur recording of sound during the taking of 16 or 9.5 m/m films.

From the foregoing description of the uses to which the "Permarec" can be applied it will readily be appreciated that here is the most interesting form of entertainment for the home.

Through the medium of the "Permarec" it is possible for the musically inclined members of the family to make a permanent and true record of their capabilities.

Children's progress in speech and music can be faithfully recorded for future enjoyment and interest; and, duplicate records sent to relations in distant parts of the world.

Any particularly interesting turn, nationally important speech, or instructive talk on the wireless can be permanently recorded for future reference.

By means of the foregoing examples, and many others, it will be understood that a fascinating library of home-recorded records can be built up.

For the "Home Cine" enthusiast there is unlimited scope for the use of the "Permarec" record and Home Cine Talkie attachment.

Films, no matter how old, can be given new life by adding to them music or an interesting running commentary.



Furthermore it is now possible to make mouth synchronised talking pictures in the home by attaching the Permarec Universal Synchronising Turntable to 16 or 9.5 m/m Camera.

The reproduction which can be obtained on Permarec discs is far in advance of any system of home recording yet offered to the enthusiast, and has proved itself superior to that even of Sound on Film.

A visit to our show-rooms will convince you that here is the most interesting entertainment for the entire family and will provide many hours of enjoyable amusement.

For professional people our service will prove convenient and attractive. We have a fully equipped studio and a technical staff is always available to give advice and assistance.

Records are ready for collection 3 hours after recording.

## STUDIO PRICES.

10 inch Records.	12 inch Records.	16 inch Records.
Single Sided 7/6 each	Single Sided 10/6	Single Side £2/2/0
Double „ 10/6 „	Double „ 12/6	Double „ £3/3/0
Duplicate Records 5/- and 7/6 respectively	Duplicate Records 8/6 and 10/6 respectively	Duplicate Rec. £1/10/0 Respectively
	Commentaries to films	Commentaries to films
	S'le. side 200ft. £1/1/0	Single side £2/2/0
	Dbl. „ 400ft. £2/2/0	Double „ £4/4/0

Quotations for quantities and advertising records on request.



## INSTRUCTIONS FOR USE OF "PERMAREC" EQUIPMENT.

**H**OME-RECORDING is very similar to amateur photography; you may therefore remember, that the first snaps you took were by no means the best. If you, therefore, read and study the instructions carefully, you should obtain fair results with your first record. A little further practice, however, will enable the operator to produce records with a performance equal to that of a standard record. Whilst it is not essential to use the entire "Permarec" range we have proved from tests carried out that the best results are obtained only when using "Permarec" apparatus. For instance, the "Permarec" Thermion is adjusted to give the exact temperature to bake the Records, so guaranteeing perfect reproduction and life of Record.

The "Permarec Tonator" is adaptable for recording or reproducing. We have found that when once the correct tension is obtained to give the exact cut required when recording, it is better to reproduce by means of an ordinary pick-up, thus ensuring perfect recording on all occasions. The above applies to all the "Permarec" range, and where "Permarec" accessories are used, and the instructions followed carefully, first-class results can be obtained.

To use any apparatus successfully, and obtain the best results from it, it is necessary to understand thoroughly what its work is, and how it does it. We therefore give you a detailed explanation of each component which comprises the "Permarec" Home Recording System.

**THE RECORD** is a metal disc covered on both sides with a soft substance in which the recording grooves are to be cut.



Before recording great care must be taken not to damage the surface of the soft coating. If scratches or indentations are made whilst the record is plastic such blemishes become permanent after baking, and are reproduced when the finished record is played. Great care must also be taken to brush from the record, before baking, all particles of the coating, or dust deposits. A camel-hair brush is supplied for this purpose.

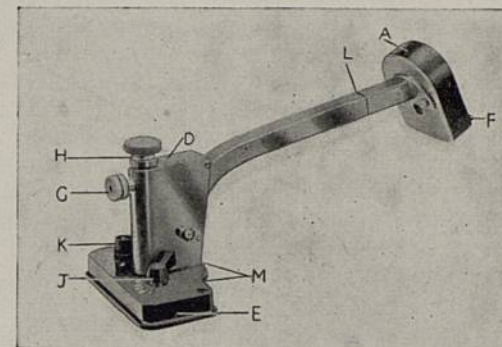
It cannot be too strongly emphasised that dust and any deposits left on the records before and after recording are the greatest causes of excessive background noise when reproducing the records. We strongly advise the baking of the records to be done in a Permarec Gas or Electric Thermion, which in the case of the Electric are designed for 100, 200, 210, 220, 230 and 240 volts, A.C. or D.C., and must be used only on voltages for which they are constructed.

In the case of the Gas Thermion, the baking must continue for a period of 3 hours, at a temperature of 175 degrees centigrade, which temperature must be reached in less than 20 minutes. In the case of the Electric Thermion the temperature is automatically controlled and the baking period must not exceed 2½ hours.



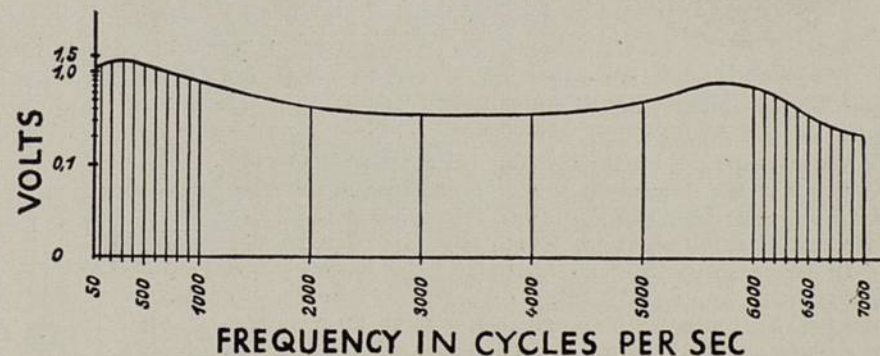
After baking it is advisable to allow the record to cool for a period of fifteen minutes and a thin coating of vaseline will assist the clearing and the polishing of the grooves in the first few playings. The vaseline should then be polished off with a dry duster. **Only Permarec Reproducing Needles should be used.**

## THE PERMAREC D.T. 4. RECORDING PICK-UP.



(Fig. B).

Being a specially designed Pick-up with a frequency curve as shown in Fig. C, and incorporating: Volume control (h), automatic electric-motor stop (j), nut for adjusting the weight of the Pick-up when recording (g), connection screw for clamping conveying arm of groove-cutter (h), junction contacts for head-phones, for controlling the sound when recording (m), spring nut for holding needles (f), Pick-up head (a), head swivel (l), bakelite base (e), nickel-plated centre pillar (d), complete with necessary wiring, porcelain dual connections, and earth clip.



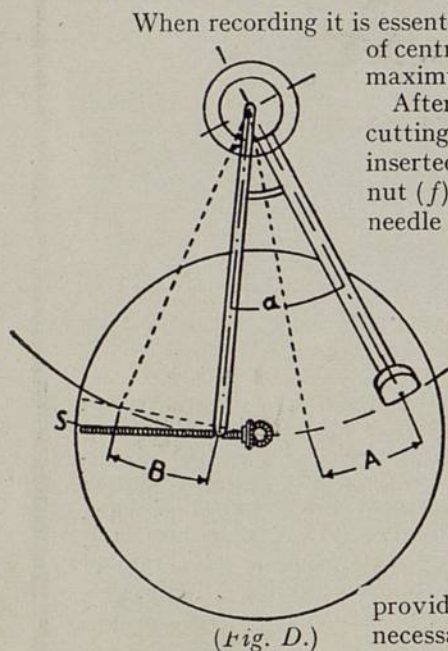
(Fig. C.)





The Pick-up's duty is to cut a spiral groove in the plastic surface of the Record with sound-producing modulations.

The cutting needle must be sufficiently sensitive to record high and low frequencies efficiently, but great care must be taken to ensure that the cutting needle never cuts through the plastic surface of the Record on to the metal base, also that the Pick-up arm (c) Fig. B. is parallel to the Record when in cutting position. The depth of cut is controlled by a nut on back of centre pillar (g) Fig. B. When mounting care must be taken to see that the point of the cutting needle on its radius crosses the Centre of the turntable spindle as shown in Fig. D.



(Fig. D.)

When recording it is essential to see that the volume control, on base of central pillar (k) Fig. B, is set at No. 8, otherwise maximum volume will not be recorded.

After mounting the recording Pick-up the cutting needle supplied with the Record is inserted in the Pick-up head by pressing on spring nut (f) Fig. B, which when released holds the needle firmly in position. Great care must be used to see that the needle is inserted in the Pick-up head at the correct angle, i.e., 15 deg. between the lateral axis of the needle and the back plate of the Pick-up, also the hollow spoon face of the needle point to be facing the direction of the rotation of the Record (see Fig. E.)

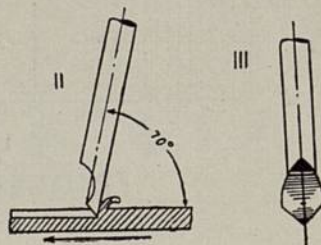
Whilst recording it is desirable to control the volume and quality of the sound, therefore, in the base of the recording Pick-up, junction contacts are

provided for headphone leads (m) Fig. B; it is necessary, however, to connect in series with the headphones a '3 megohm resistance, with the

headphones and resistance connected in parallel with the recording Pick-up. A better control is obtained by use of the "Permarec" Volume Indicator and Output Transformer explained on page 8.

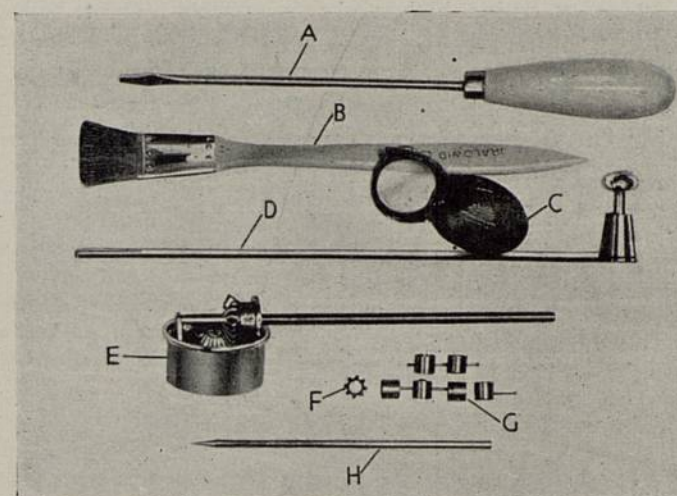
When Pick-up head is turned up to insert needle, with spoon face towards the front, the needle should be turned in a clockwise direction so that the flat rear face makes an angle of 15 degrees to the lateral axis of the Pick-up.

(Fig. E).

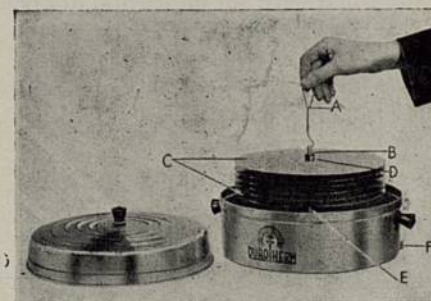


## THE "PERMAREC" GROOVE CUTTING ATTACHMENT.

(Fig. F)



Consisting of : (a) Screwdriver, (b) Camel hair brush, (c) magnifying glass, (d) conveying arm and spring-loaded tracker, (e) driving mechanism, being a centre boss in which is mounted a pair of bevel gears on a ball race, actuating a threaded tracking arm with a standard groove-spacing of 50 to the inch, (f) a spring washer for placing between the conveying arm and nut (k) Fig. B, (g) split collars of varying size for adapting the hole in the base of the centre boss (e) to different sizes of turntable spindles, (h) a scriber for writing title of Record before baking. The duty of this attachment is to convey the recording Pick-up across the surface of the record whilst recording.



(Fig. G).

## THE "PERMAREC" ELECTRIC THERMION

(Fig. G)

The "Permarec" Electric Thermion (Fig. G), consisting of : An aluminium container and lid with an electric heating element in the base ; The Record carrier (B), with a spacer (D) between each record, and protective plates (c) is placed on centre pin (E) ; a hook (A) is supplied for removing the complete record assembly from the oven when hot ; a socket connection (F) is provided for attaching the electricity supply by means of the plug and flex.



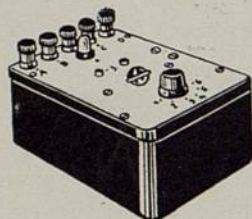
## THE "PERMAREC" GAS THERMION

Is designed for use where electric current is not available, and is designed to fill the necessary requirements. The dimensions are: 12 ins.  $\times$  12 ins.  $\times$  24 ins. high, and incorporates protected gas ring and Record holder and spacers, together with Centigrade thermometer.

### "PERMAREC" VARIABLE OUTPUT TRANSFORMER.

(Fig. H).

For adapting to Wireless Sets and amplifiers without output transformers or choke output when recording. Being a special matching device consisting of an auto transformer, a condenser, a quality corrector, a safety bulb and connections across a resistance for headphones; two sockets are also provided for use with the "Permarec" Volume Indicator, Fig. J.



(Fig. H)

### "PERMAREC" VOLUME INDICATOR

(Fig. J).

Which is used to measure the alternating speech current to the recording Pick-up, to indicate when too much volume or distortion is being applied to the recording needle. It comprises a voltmeter, and a Valve rectifier for alternating current of any frequency. This is a first-class instrument for use with the output transformer by the serious experimenter and constructor, and best results are obtained with an indication of about 20.



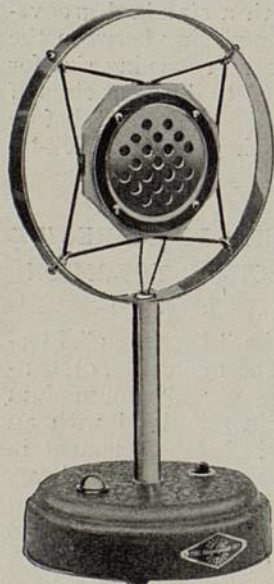
(Fig. J).

### THE "PERMAREC" D.R.I. MICROPHONE.

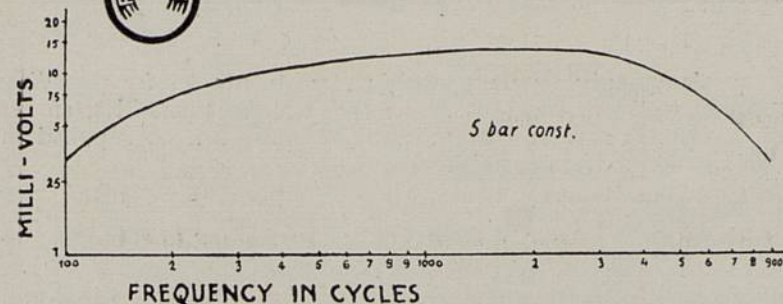
(Fig. K).

This is an instrument of unusually good quality, with a response curve as shown in Fig. L.

It is a carbon granule microphone suspended by rubber strings in a metal ring. In the base is an output transformer with three alternative connections, also the microphone feeding battery. On the top of the base is a control switch with an indicating light.



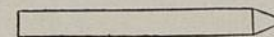
(Fig. K.)



(Fig. L).

### THE "PERMAREC" SPECIAL NEEDLE.

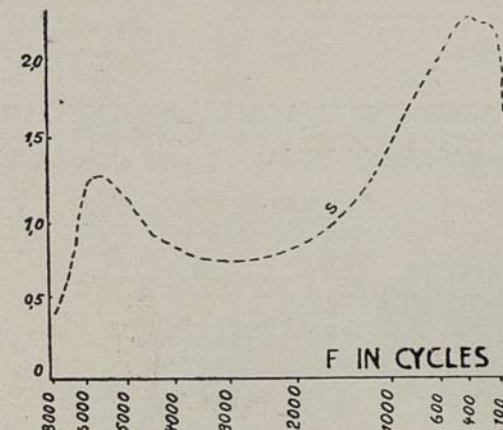
(Fig. M).



(Fig. M.)

With a response curve as shown in Fig. N.

This is a specially designed and tempered needle giving the very best results when used with "Permarec" Records



(Fig. N)

### THE "PERMAREC" RECORDING TURNTABLE

(Fig. O).

For use when re-recording gramophone records or wireless items, and is used in conjunction with a radiogram, gramophone and wireless Receiver.



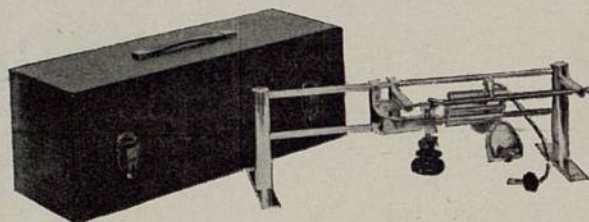
(Fig. O.)



We can also supply a unit comprising two turntables for recording and reproducing with fader mounted between the turntables, spring motors or electric motors. Both turntable units can be supplied in Oak, Mahogany or Walnut finish.

The recording turntable consists of a high grade spring motor, driving a turntable through a governor. It is mounted in a completely enclosed leatherette covered case with clips and handle for portability. A speed controlling lever and scale, together with needle cup is fitted. A mounting is arranged for the "Permarec" Recording Pick-up, and a reproducing Pick-up is fitted and wired for use.

#### SPECIAL PERMAREC STRAIGHT LINE TRACKING DEVICE WITH D.T. 7. RECORDING HEAD.



(Fig. P.)

This unit is a scientifically designed precision instrument for constant and accurate recording. It is of heavy and solid construction.

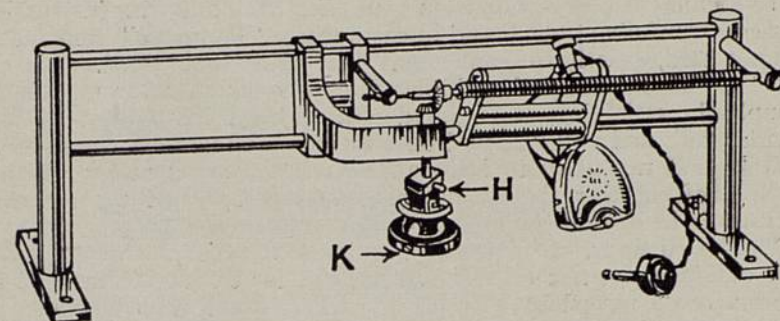
This combined with a weight controlled recording head enables any number of recordings to be made without further adjustments.

It is of gun metal finish and is supplied in a very substantial fitted felt lined case for portability and adequate protection when not in use.

The size of this instrument is 20 inches between the outside edges of the two end plates, 5½ inches between the centres of the fastening down holes, and 6 inches overall height, and can be used to record 10, 12 and 16 inch records from the centre to the outside or vice versa.



#### STRAIGHT LINE TRACKER.



(Fig. Q.)

For the successful mounting and operation of this unit, the following details must be carefully studied.

First place the device on the motor board with the driving boss a sliding fit on the centre spindle of the turntable, by loosening the two locking screws *h* and *k* Fig. Q, securing coupling to centre spindle of tracking unit, and securing coupling boss to centre spindle of turntable. Then mark the holes through the tracking unit feet on to the motor board and placing the necessary packing plates under each foot until with a record on the turntable the distance between the record and the centre of the lower of the two parallel rods is 2 1/8 inches, in this position fasten the unit firmly to the motor board.

To obtain the required depth of cut, unlock the balance weight at the opposite end of the Recorder Arm, and to lighten the cut unscrew, and to deepen the cut, screw up towards the recording head. The correct cut is obtained when the width of a groove cut is equal to the distance between the grooves when examined through a magnifying glass.

For recording records from the centre to the outside, the gear on the right of the one on top of the centre spindle should be engaged, and for recording from the outside to the centre of the record, the one on the left must be engaged, but never on any occasion must both be left engaged.

These gears in conjunction with the lead screw (*b*, Fig. Q.) give 93 threads to an inch, it is possible therefore to record 3¼ minutes and 5½ minutes continuously on one side of a 10 and 12 inch Record, at 7½ r.p.m., and 16½ minutes on each side of 16 inch record at 33¼ r.p.m.

Owing to the large amount of needle wear on a 16 inch disc, these must always be recorded from the centre to the outside at 33 1/3 R.P.M.



## DETAILED INSTRUCTIONS FOR THE USE OF "PERMAREC" RECORDING EQUIPMENT.

To obtain the best results from your efforts the following instructions must be carefully studied, and in cases where "Permarec" components are not used, exactly the same equivalent must be obtained.

"Practice makes perfect," therefore, if your first attempt is not completely satisfying, it is, no doubt, through inattention to some small detail, and you will find that further attempts are successful.

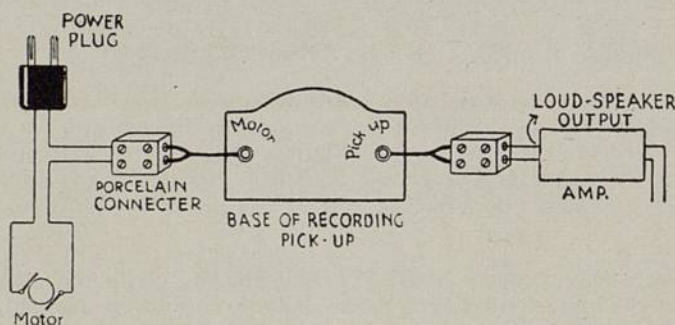
It is first necessary to have an electric or spring motor which is capable of rotating the turntable at 78 r.p.m., when the recording Pick-up is in operation.

The board under the turntable, as is usual with most gramophones and radiograms, must be sufficiently large for the attachment of the "Permarec" recording Pick-up by three wood screws, using the template on the bottom of the Pick-up box to ascertain the position. The "Permarec" recording turntables are supplied with a mounting in position, with three studs and wing nuts.

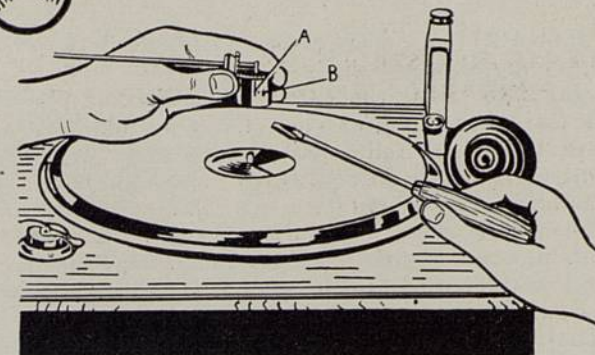
### The Mounting of the Recording Pick-up.

When mounting the Pick-up on your own turntable, gramophone or radiogram, great care must be taken to mount it in the correct position, with the cutting needle on its radius passing the centre of the turntable spindle, as shown in Fig. D, page 6.

With the Pick-up in the cutting position on the record the Pick-up arm must be parallel to the face of the record. If necessary the base of the Pick-up should be raised with a piece of wood or vulcanite. The wiring of the Pick-up is as shown in the following diagram.



The "Permarec" Groove Cutting attachment is mounted by fixing the centre boss to the turntable spindle, after placing a blank standard record on the turntable and then the "Permarec" Record upon which the recording is to be done, by first selecting the split collar (see page 13) which fits the turntable spindle without opening. The boss (a) Fig. 1. is then pressed on to the spindle with the collar in place and the locking screw (b) Fig. 1, tightened, care being taken to see that the centre boss is pressed tightly on to the Records.

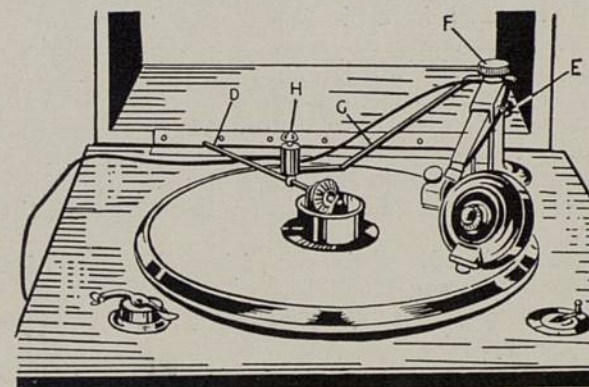


(Fig. 1).

If the Groove Cutting attachment works properly, the worm axis (d) Fig. 2, will not oscillate when held at the end with the turntable running.

Having mounted the "Permarec" recording Pick-up as already explained the

conveying arm (g) Fig. 2 is placed with the fork end under locknut (f) Fig. 2 with the star spring washer between the conveying arm and the nut. In most cases it will be found necessary to bend the conveying arm (g) Fig. 2 so that the spring-loaded tracker is lying with a soft pressure on the threaded tracking arm, attention being given to see that the nut (h) Fig. 2 is in a vertical position. The cutting needle is now inserted as described on page 6, and the needle held 1/8 in. from the outside edge of the record. The nut (h) Fig. 2 must be not less than one inch from the centre boss on the threaded tracking arm (d) Fig. 2, in this position the nut (f) Fig. 2 is tightened firmly. The depth of cut to be made when recording is adjusted by turning nut (e) Fig. 2.



(Fig. 2).

Take care to see that the turntable is revolving at the standard speed of 78 r.p.m., and the volume control on the recording Pick-up base is set at its maximum position, i.e., No. 8.

It is recommended that a spare unbaked record be kept for making trial cuts of a few grooves to obtain the correct setting of the spring adjustment of the Pick-up arm. The correct setting is when the width



of a groove cut is equal to the space between two grooves when examined with the magnifying glass supplied.

Never at any time must the recording needle be allowed to cut right through the soft coating, exposing the metal base of the disc.

It is desirable to control the subject being recorded so that the beginning and end will not be missed. The "Permarec" Record gives three minutes playing on either side, and we recommend a trial of the subject for recording with the Pick-up and groove cutting attachment in position and the motor running, the Pick-up, however, turned up to clear the record. In this way the length of the subject can be accurately gauged by the travel of the Pick-up across the disc.

During this trial all connections can be made and the operator can, by use of the headphones, or loud speaker connected in place of the Pick-up, adjust the volume and quality of the subject to be recorded. With these adjustments made, and the Pick-up connected to the output or speaker terminals of the amplifier or radiogram, you are ready to commence recording.

Start the turntable motor, place the recording Pick-up on the disc 1/8th of an inch from the outside edge; allow two or three grooves to be cut before fading in, or commencing to record.

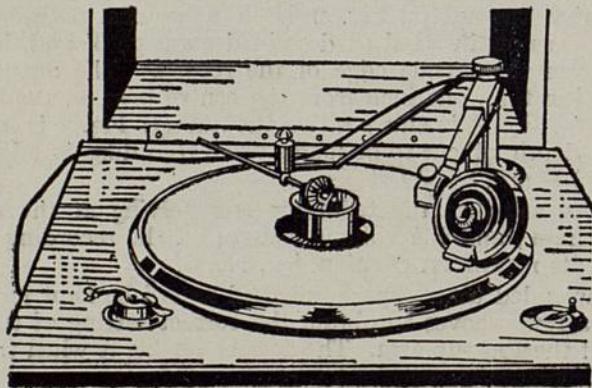
The fine shaving which is cut from the face of the disc when recording should be lightly brushed towards the centre of the disc.

The recording must be continuous to produce a first-class record, and the Pick-up lifted off the record when it has completed two or three grooves after the recording has stopped.

Remove the record and write in the title while the record surface is still soft.

When both sides of the record have been recorded it is placed in a suitable oven, suspended correctly and baked at a temperature of not less than 80 deg. centigrade for a period of not less than two-and-half hours.

When cold the record can be played with steel needles for several hundred times without material loss in the quality of the recording. Being on a metal base, the record can be dropped without fear of breakage. A diagram of the equipment set up for recording is given below.



## APPOINTED PERMAREC AGENTS.

### LONDON :

MESSRS. CITY SALE AND EXCHANGE (1929) LTD.  
59, CHEAPSIDE, E.C.2.

MESSRS. CITY SALE AND EXCHANGE (1929) LTD.  
93, FLEET STREET, E.C.4.

MESSRS. CAMERA AND GRAMOPHONE CO.  
320, VAUXHALL BRIDGE ROAD, S.W.1.

MESSRS. CAMERA CRAFT,  
THE PARADE, PALMERS GREEN, N.22.

### COUNTRY :

MESSRS. AMATEUR CINE SERVICE,  
50A, WIDMORE ROAD, BROMLEY, KENT.

MESSRS. HARMONY ELECTRIX, LTD.  
226, COWLEY ROAD, OXFORD.

MR. WALTER SCOTT,  
26, NORTH PARADE, BRADFORD.

MR. P. HEATHCOTE,  
302, RADFORD ROAD, NOTTINGHAM.

MESSRS. HIDDERLEY RADIO SALES,  
ST. PETERSGATE, STOCKPORT.

MR. EDWIN GORSE,  
86, ACCRINGTON ROAD, BLACKBURN.



# Memorandum

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