



INSTRUCTIONS FOR INSTALLATION AND OPERATION

DUAL 1009

Auto/Professional Turntable with dynamically balanced tonearm

FOR SINGLE PLAY AND CHANGER OPERATION

It is customary at this point to congratulate the owner on his wise choice and to urge him to read the instructions carefully before going any further into the unpacking. We certainly do both. As you have obviously been already convinced that the Dual 1009 was your very best choice, there is little need for us to toss any further bouquets. However, in addition to the instructions themselves, you will find descriptions and illustrations of the Dual's more extraordinary features for

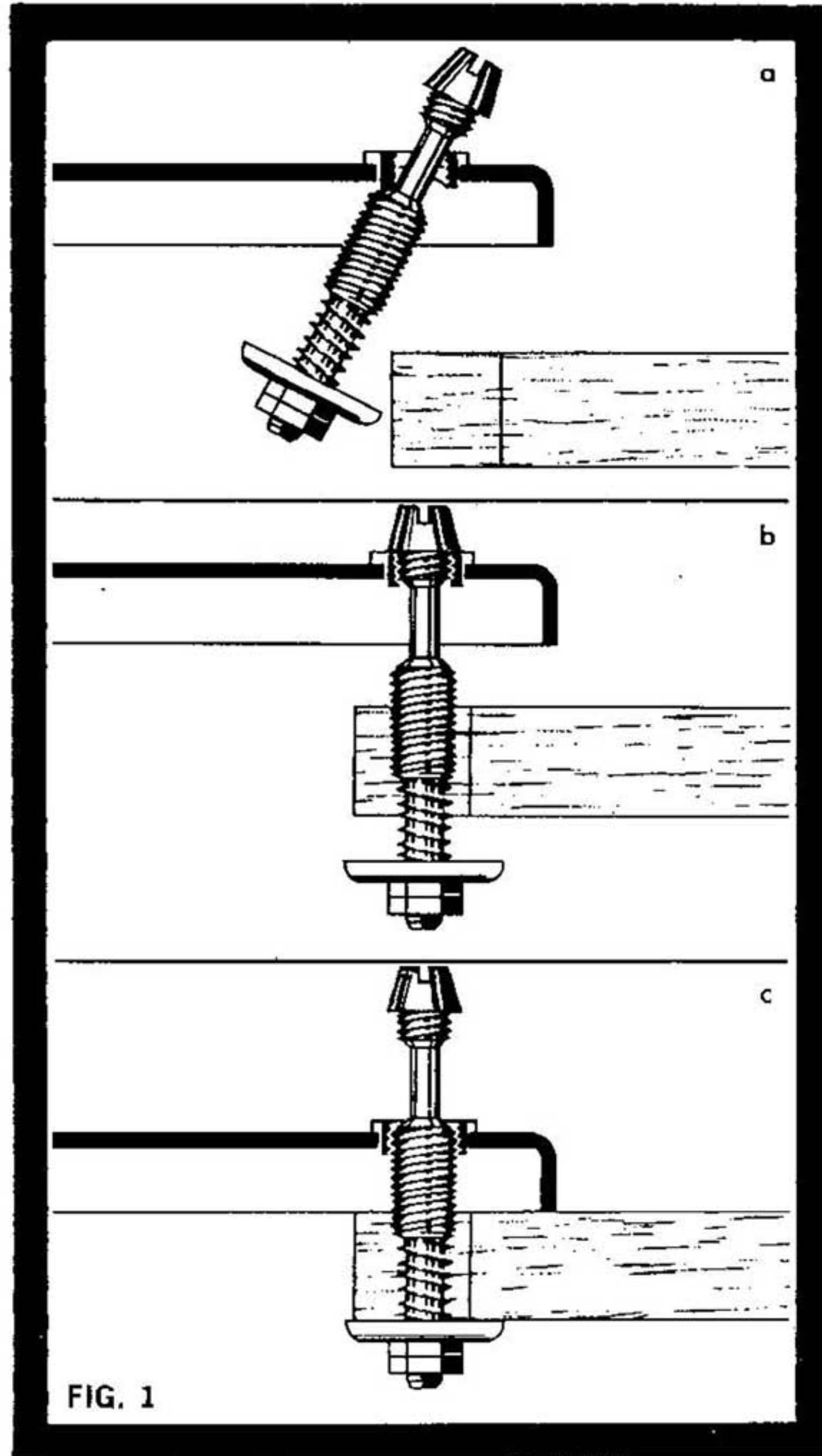
your further enlightenment and "pride of ownership." Before you turn your attention to them, it is most important that you read the instructions quite carefully and in their proper sequence for installation and operation. Then you will be able to appreciate all the more, the truly notable advance in the technology of record reproduction equipment that has been so superbly conceived and accomplished by the design and engineering of the Dual 1009.

DUAL 1009



INSTALLATION ON BASE*

First, let us call your attention to the ingenious design of the top/mounting spring screws. These make it possible for you to mount and secure the Dual 1009 to its base (or to the cut-out mounting board of a console) entirely from the top. No need to fumble underneath, nor to take anything apart. (Clearance of only 1" is required at



the right and rear to provide for the tonearm's unusually short overhang.) Here's how it's done. Hold the chassis above the base so that the three spring-mounted footings will fit into their cut-outs. As you lower the chassis, tilt the spring screws (*fig. 1a*) to let them slip past the special notches. Then turn each screw clockwise until it is firmly seated into the top of the chassis (*fig. 1b*). To remove the Dual simply reverse the procedure.

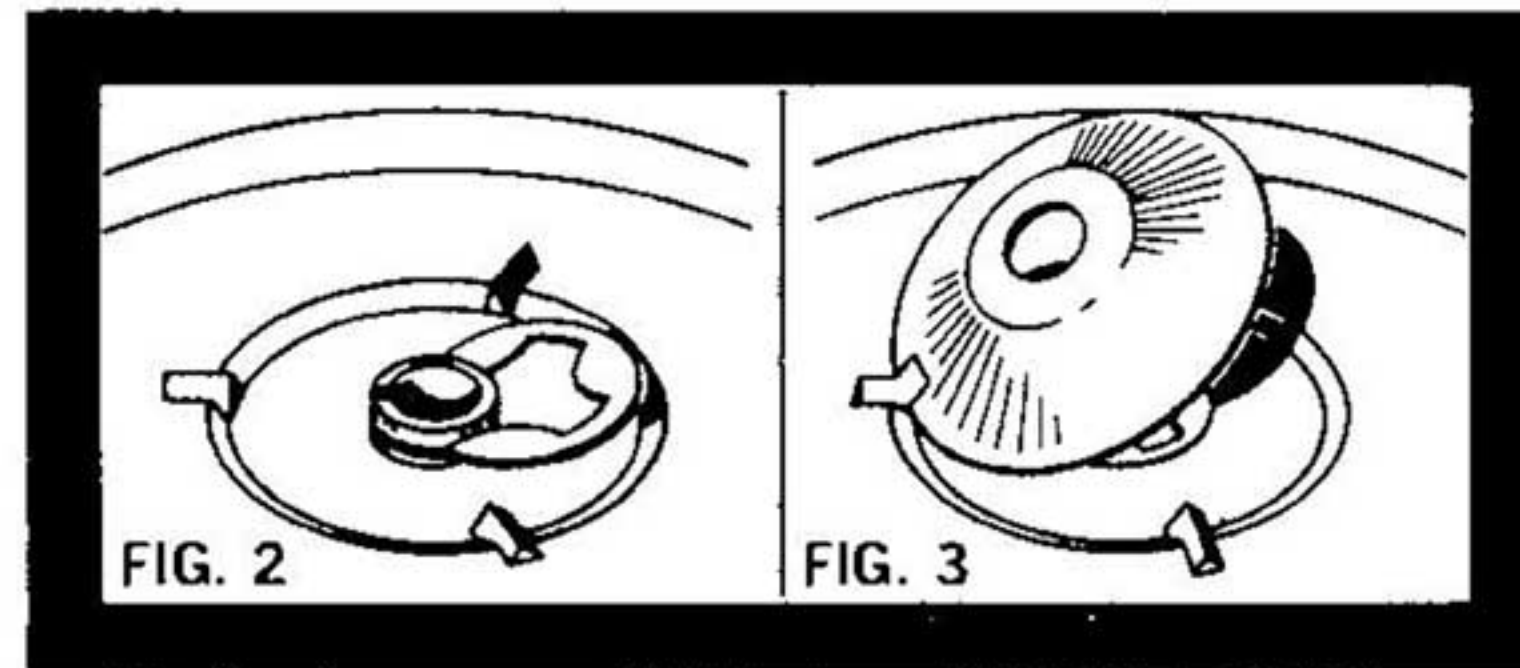
To transport the Dual at any time together with its base, first loosen each screw, pull it up and continue to turn it *counterclockwise* until its bottom threads engage. You will find this easier to do if you depress the chassis against the base while turning the screws (*fig. 1c*). It's also advisable to remove the turntable from the chassis to avoid possible damage in transit. Or you can wedge the plastic strips (supplied in the accessory bag) between the turntable and the chassis.

MOUNTING THE TURNTABLE*

With the chassis now on its base, insert the short (single play) spindle into the center shaft. (Its function

at this stage is simply to serve as a guide for lowering the turntable.) As you lift the turntable from the carton, you will note an oiled felt plug in its center hole. Don't remove it by hand. Instead, allow the spindle to ease it out as you slowly and gently lower the turntable onto the receiving shaft. The plug has now performed its main mission in life of oiling the shaft and may now be discarded. (No other lubrication of the Dual is required.)

Now secure the turntable by pressing the C-clip onto the shaft (*fig. 2*). Position the C-clip so that it does not block the slot. Remove the spindle and insert the decorative round disc under each of the three projections on the rubber mat (*fig. 3*). As on other professional turntables, this mat is cemented on to preserve the perfect linearity of the surface. Do not try to peel it up.

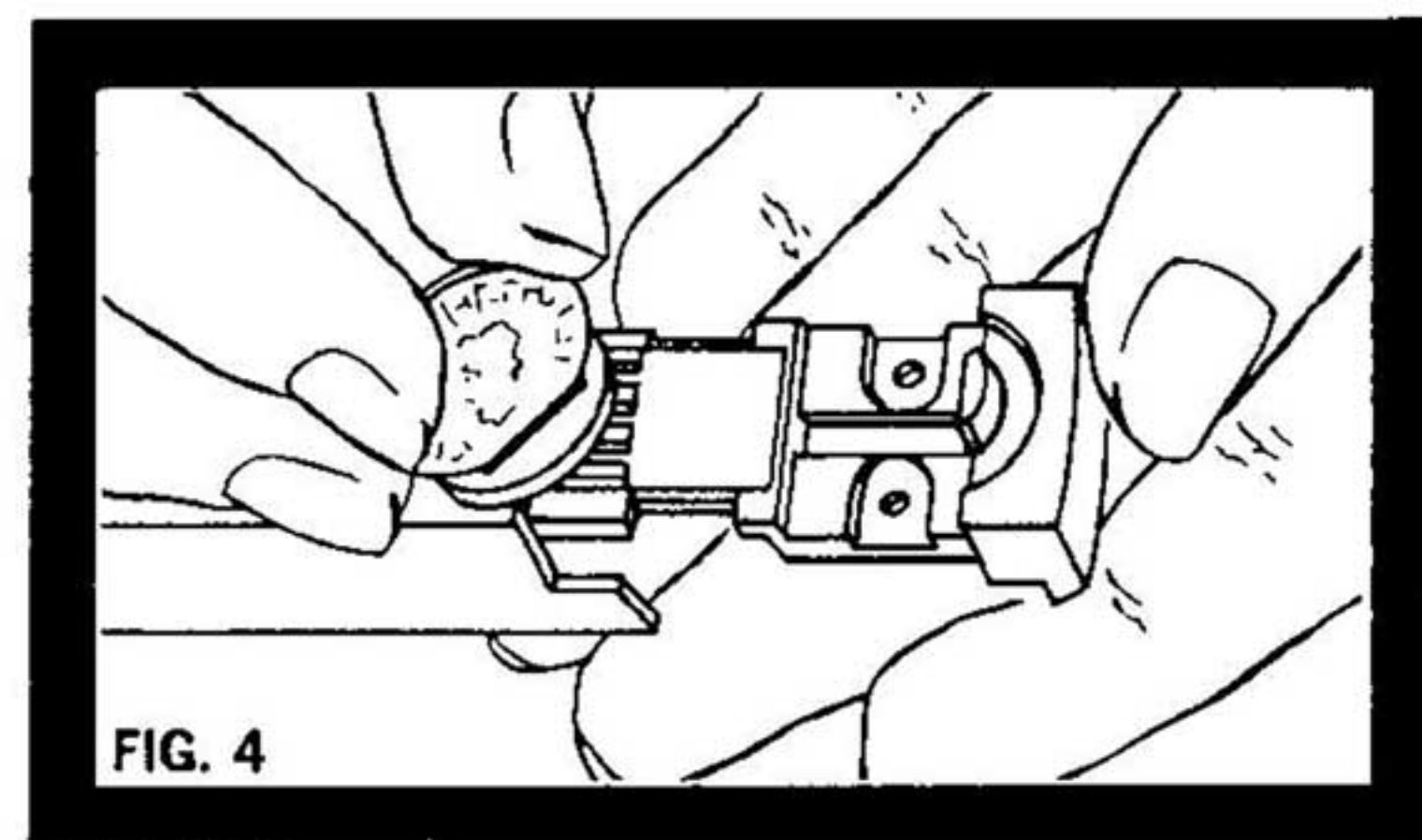


MOUNTING THE CARTRIDGE*

The cartridge for your Dual 1009 mounts within the detachable head of the tonearm. Mounting hardware consists of a selection of screws, nuts and spacers.

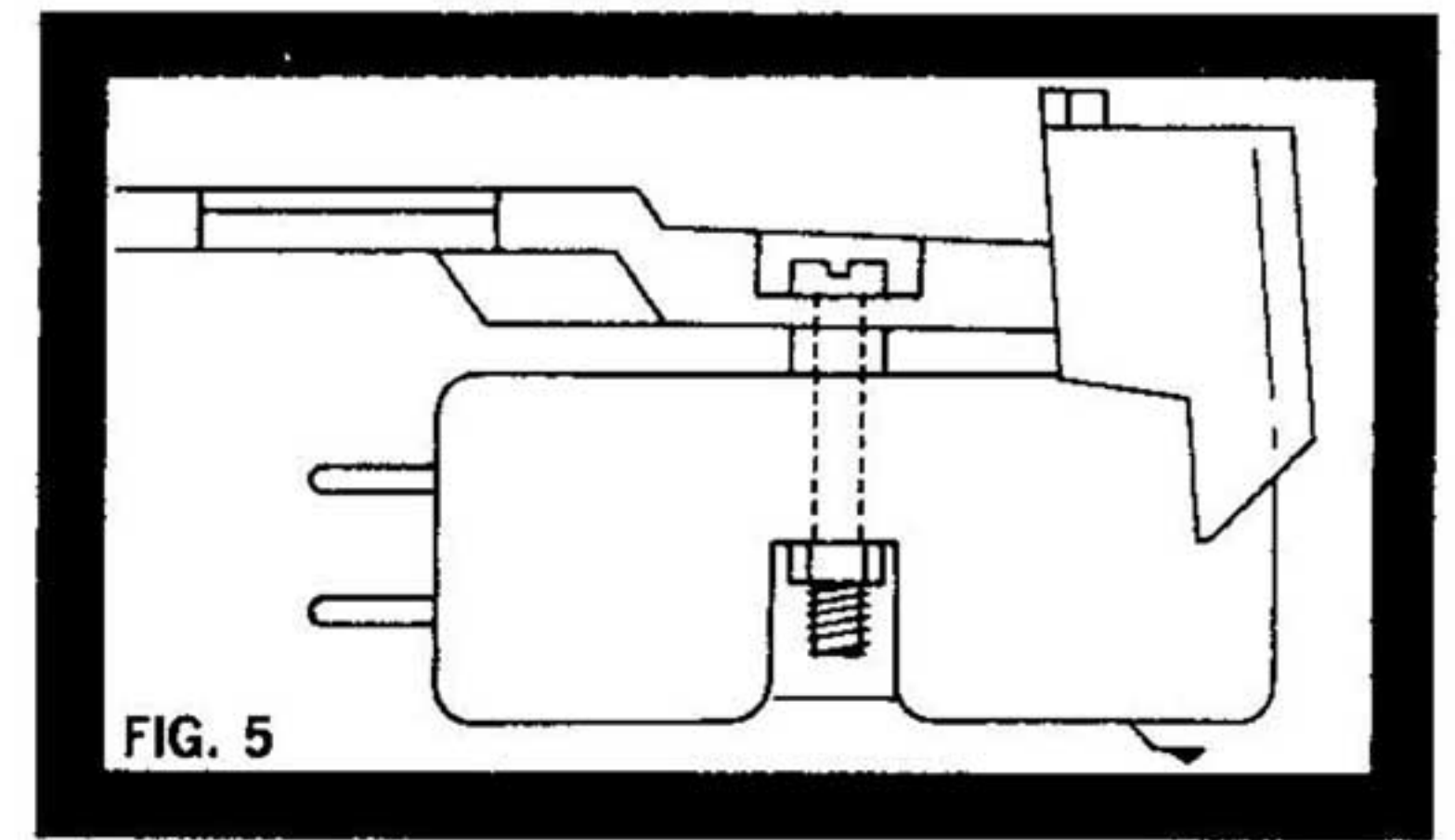
The length of screw to use will be determined by the cartridge you have selected, unless your Dual came with one already installed. Any cartridge that meets standard U.S. mounting specifications can be used.

First remove the tonearm head by turning the lock-screw counterclockwise. A coin is helpful here, as shown in *fig. 4*. Then slip the head out from the front.



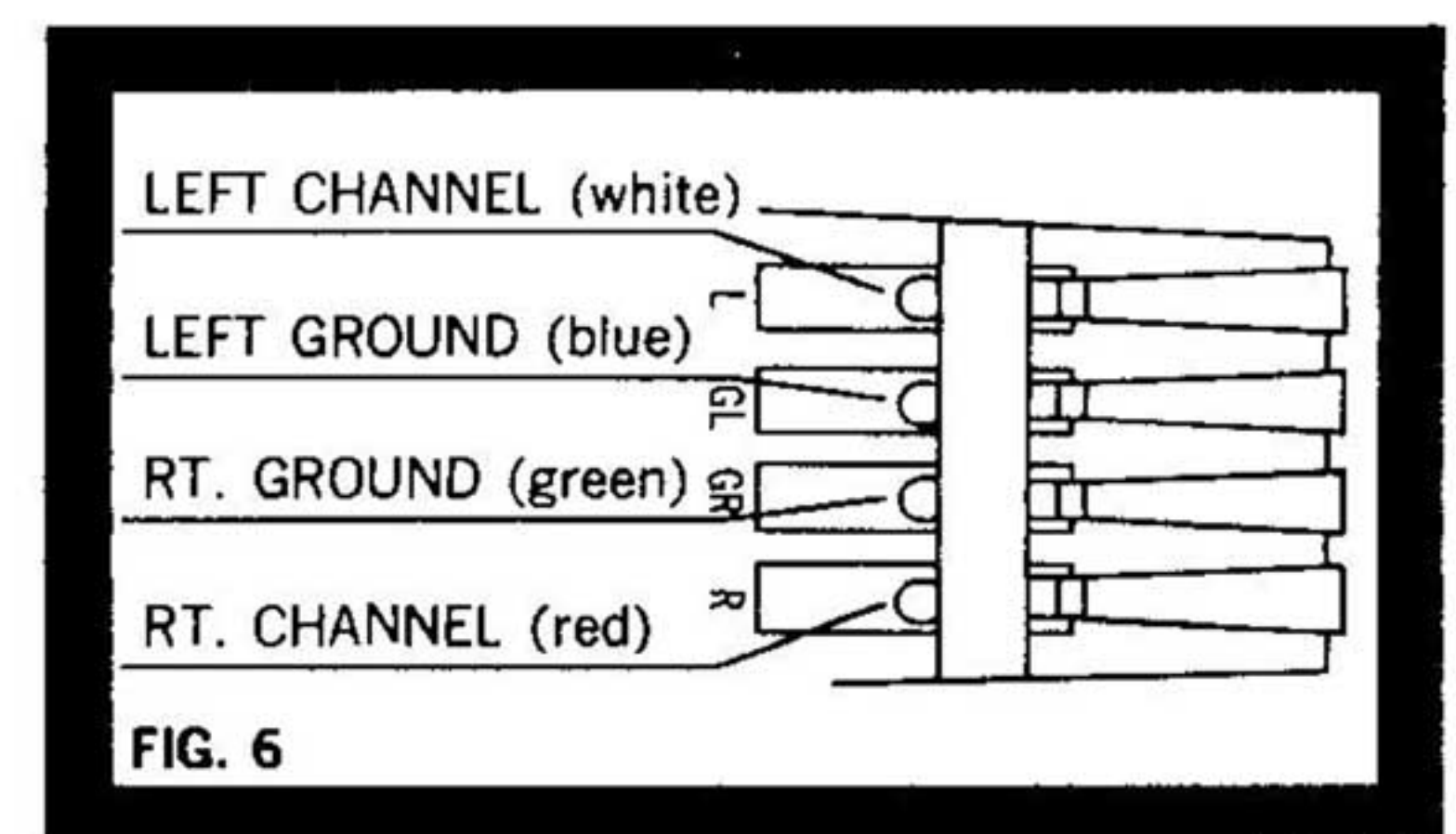
The length of spacer is not critical unless your cartridge is unusually long and will not fit within the head. In that case, select a pair of spacers that will permit the cartridge to clear the

**These instructions apply for Dual 1009's purchased as separate components. If your Dual is already mounted within a console, these installation procedures have already been made for you. However, reading these three sections will help familiarize you with the unit.*



front of the head. Note in *fig. 5* that the *head* of the screw should be against the holder, not the nut.

The wires on the cartridge holder are color-coded (*fig. 6*). The left channel lead is white, and its ground is blue. The right channel lead is red, and its ground is green. Be sure to connect each to its corresponding pin on the cartridge.

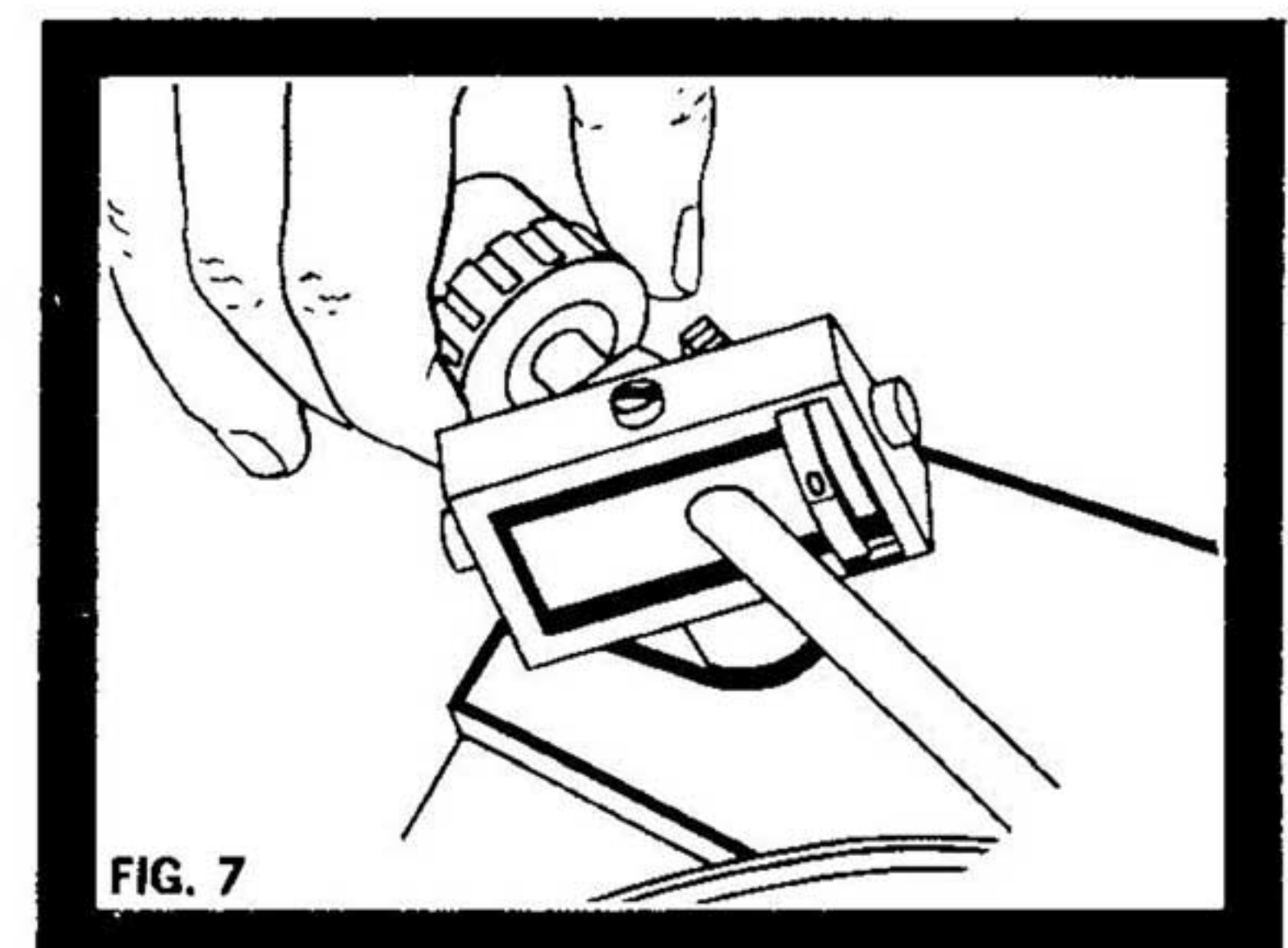


Now slip the cartridge assembly into the tonearm until it stops against the front of the lock-screw. Then apply a slight upward pressure and push it in the rest of the way. Secure it by turning the lock-screw clockwise until its slot is aligned with the direction of the head. As the screw is turned, it first acts like a cam in tightening the cartridge holder against the tonearm, thus achieving one-piece tonearm rigidity.

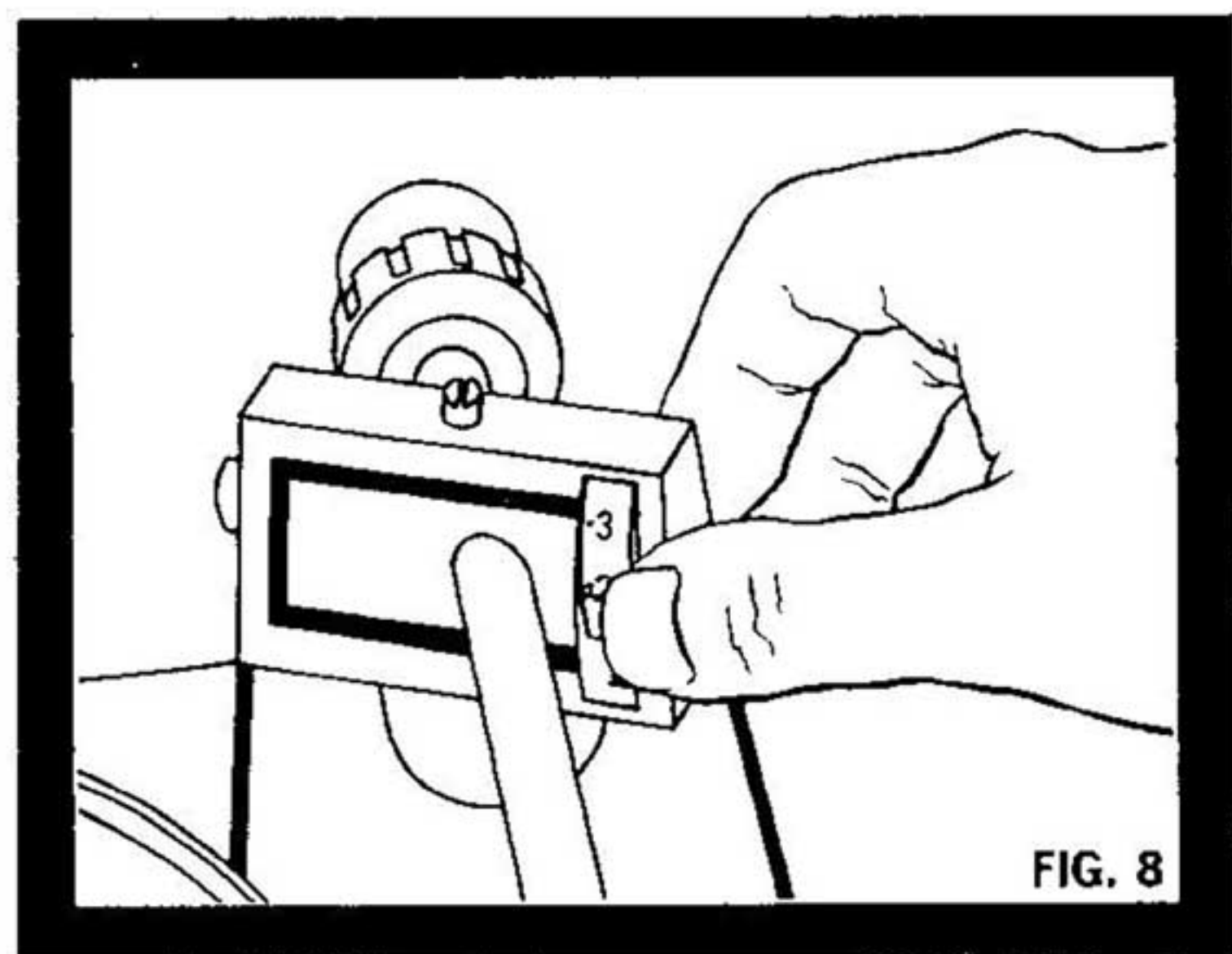
BALANCING THE TONEARM

With the stylus force scale set at 0, slip the tonearm balance weight onto the rear of the tonearm, guiding it on by the V-shaped track. Unlock the tonearm, lift it off its resting post, and slide the balance weight back and forth until the arm is roughly balanced . . . then tighten the set screw. (The slight "give" you feel in handling the balance weight comes from its internal rubber cushioning.)

For fine balance, rotate the balance weight itself (*fig. 7*). If the front of



the tonearm needs to be lightened, rotate the weight clockwise . . . and vice versa. When the tonearm is in perfect horizontal balance, apply the desired stylus force (as recommended by the manufacturer of your cartridge) by turning the stylus force scale to the number indicated (*fig. 8*).



Any cartridge weighing from 2-16 grams can be balanced with this balance weight. **The Dual 1009 will track and trip flawlessly with a stylus force as low as 1/2 gram.** Hence, the usual restrictions on the choice of cartridges for automatic equipment do not apply to this unique instrument. If your cartridge calls for a very light tracking force, be sure to balance the tonearm *perfectly* at zero in order for the scale to register accurately and the tonearm to function properly. (Naturally, the percentage of any error in balancing is more significant with a light tracking force than with a heavier one.) Of course, whenever you change cartridges, repeat the balancing procedure before applying the necessary tracking force.

Note: the balance weight has been centered on its threads at the factory, ready to be rotated in either direction. If you ever find it difficult to rotate clockwise when fine-balancing the tonearm at some future time, simply rotate the balance weight counterclockwise a few turns. Then loosen it to balance the tonearm roughly before resuming the fine-balance procedure.

TO PREPARE FOR FIRST PLAY

Before connecting the Dual to a power supply, lock the tonearm on its resting post, push the operating switch to START, and then rotate the turntable by hand until the switch returns to "neutral". This will place the trip lever in its proper functioning position. Because of its extremely free action, the trip lever is apt to be shifted out of position when the Dual is in transit. You should repeat this simple but important step whenever the Dual has been jostled, such as while travelling.

CONNECTION TO POWER SUPPLY

AC voltage and line frequency (cycles) requirements are indicated on both the outside of the carton and on the

top of the chassis beneath the turntable. The Dual can be set to either 110 VAC or 220 VAC, and for line frequency of either 50 or 60 cycles. The 60 cycle pulley is Part Number 31-N-U28, the 50 cycle pulley, Part Number 31-N-U20. Only a qualified serviceman should attempt to make either of these changes.

ADJUSTMENT FOR LEAD-IN GROOVE

The Dual's tonearm has been set at the factory to descend accurately into the lead-in groove. But if you observe on first play that the dimensions of your cartridge and/or the location of its stylus cause the latter to touch the record either too far in or too far out, the adjustment can be made simply. Move the record-size selector switch to 7" (17 cm). This will expose the adjustment screw through the opening provided in the chassis near the tonearm resting post. If the stylus touches the record outside the lead-in grooves, turn the screw *clockwise*. If the stylus touched down on the recorded grooves, turn the screw *counterclockwise*. A very slight turn will suffice in either case.

To check the adjustment, place a 7" record on the turntable and push the switch to START. Once the tonearm has been correctly set for this size record, it will be correct for 10" and 12" records as well. (If you have only a 10" or 12" record, you can also check the adjustment with either one by simply moving the size selector switch accordingly.)

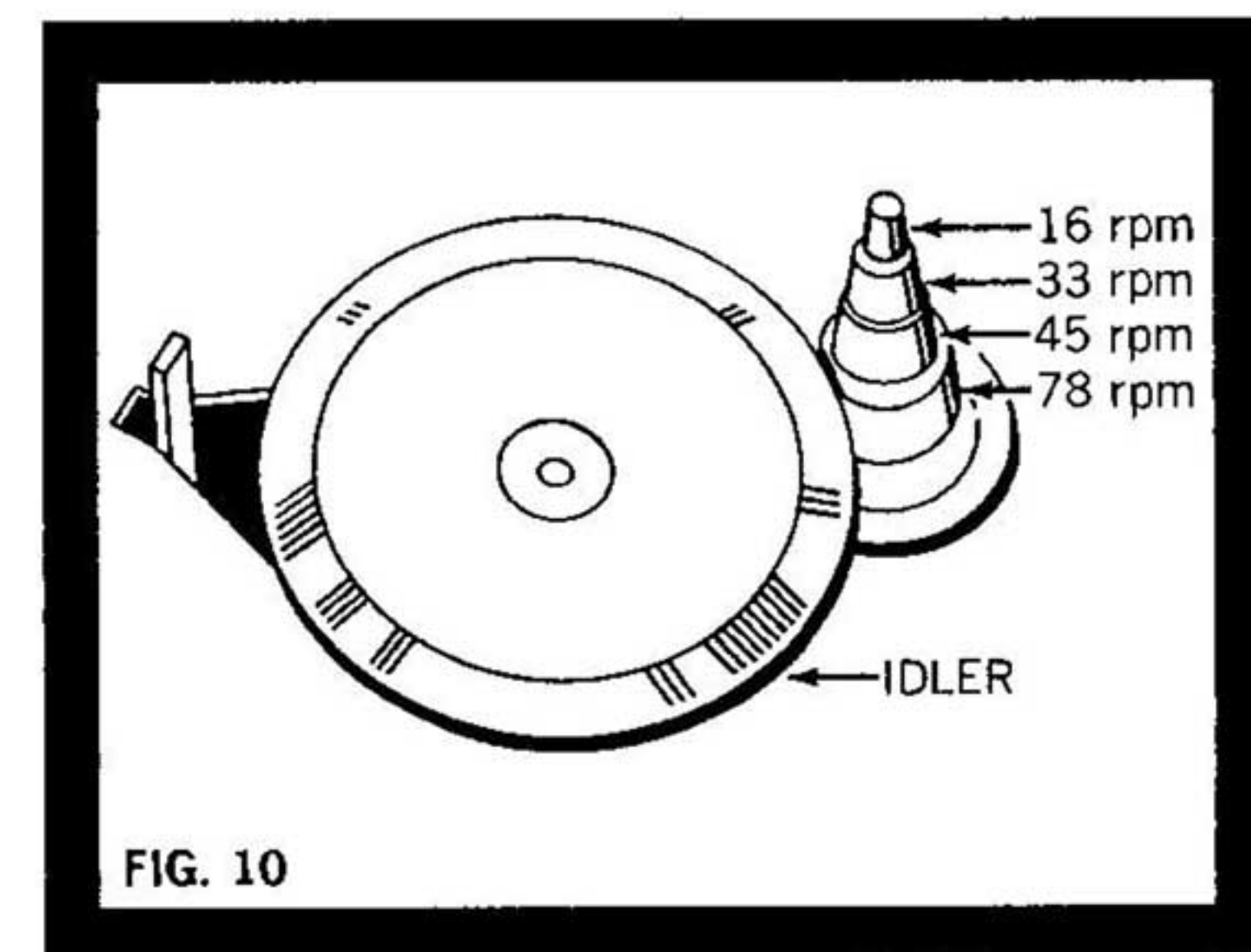
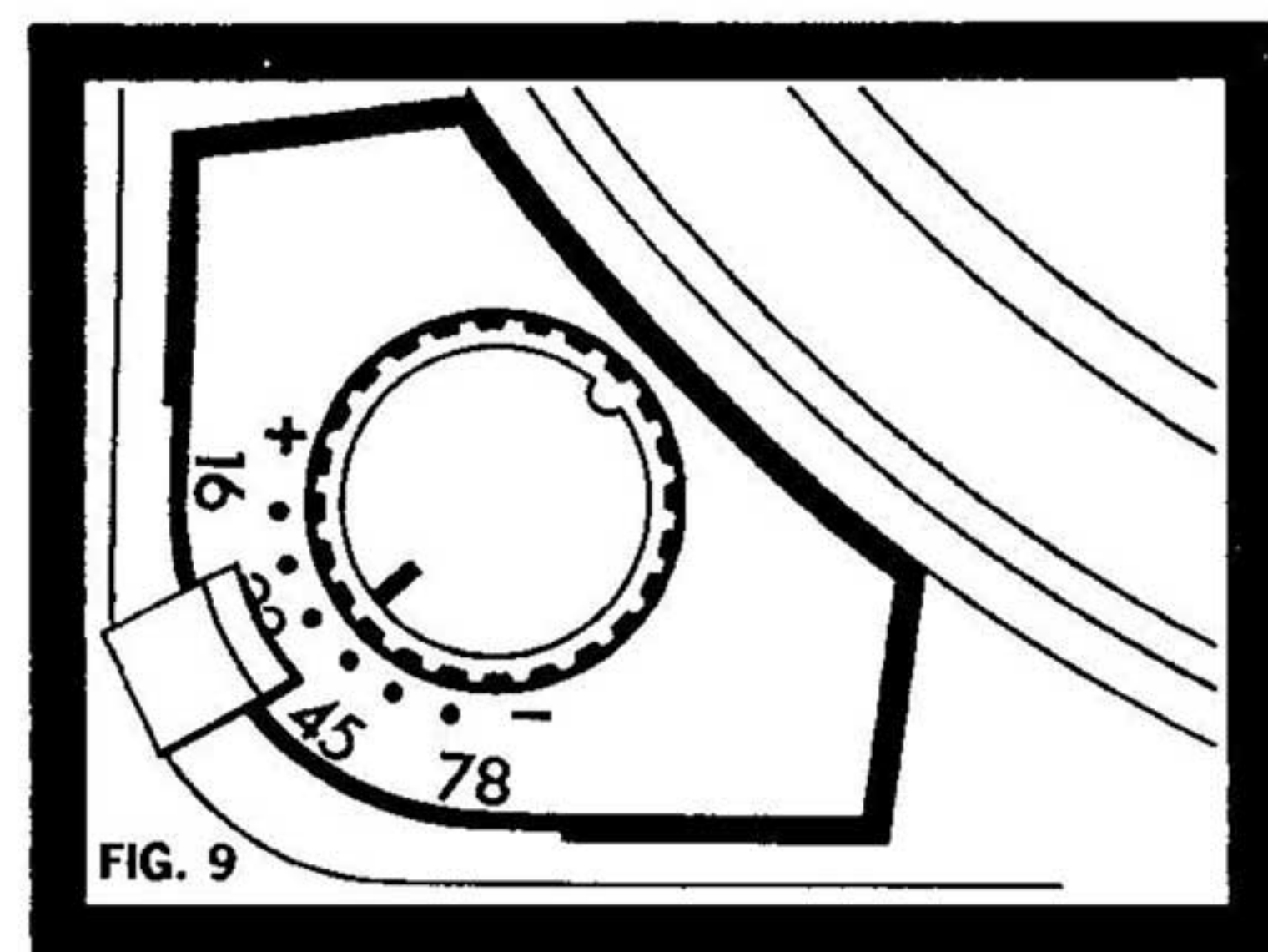
ADJUSTMENT OF TONEARM HEIGHT IN CYCLING

It is also unlikely you will have to concern yourself with this adjustment, as it has been carefully preset at the factory. However, if necessary, the height of the tonearm while cycling can be reduced by turning the height adjustment screw *clockwise*, and increased by turning it *counterclockwise*.

NOTE: there are no other adjustments to be made of the tonearm. Do not tamper with the pivot tension as it has been permanently set by special instruments.

SPEED SELECTION AND VARIABLE CONTROL

You have the four standard record speeds: 16, 33, 45 and 78 rpm, each selected by moving the speed selector slide switch (*fig. 9*). In addition, the precisely tapered sectional motor drive pulley (*fig. 10*) allows you to vary each of these speeds to approximately $\pm 3\%$ of its nominal speed! This is a unique feature in automatic equipment and rarely available even in costly separate turntable and tonearm equipment.

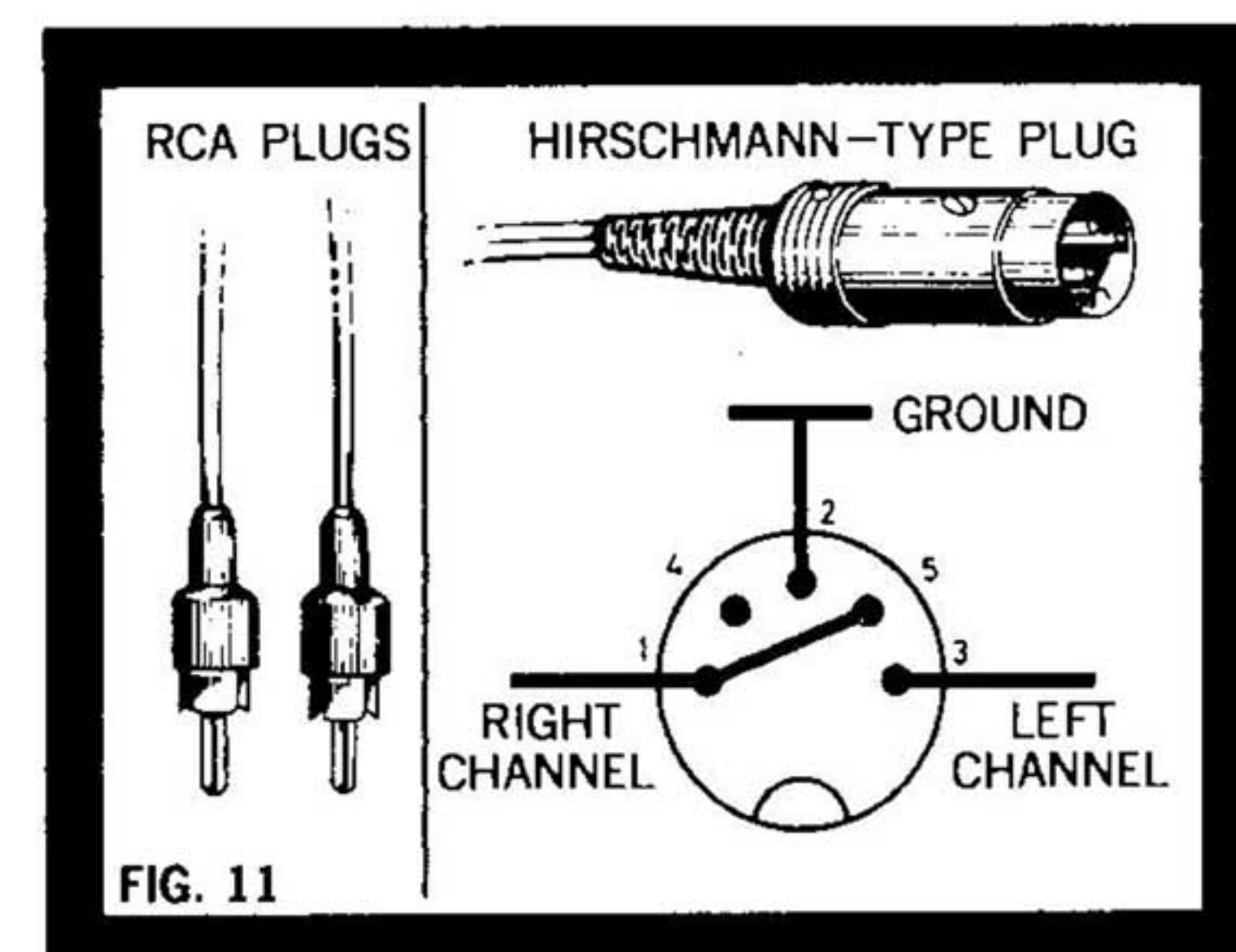


The strobe disc provided with the Dual 1009 is a self-evident expression of Dual's confidence in the accuracy and stability of all four speeds. Apart from the perfectly accurate speeds thus obtainable, you can now vary the pitch of any record, a feature especially desirable to serious music listeners, students, those recording onto tape, and every perfectionist.

Note: the motor drive pulley and the idler automatically disengage after play, thus preventing any possibility of flat spots developing on the idler.

CONNECTION TO AMPLIFIER OR OTHER AUDIO EQUIPMENT

If your Dual 1009 is supplied with RCA plugs (*fig. 11*), use the red cable



for left channel, and the yellow cable for right channel. The Hirschmann-type plug, supplied with some models, is also illustrated, along with its channel connection schematic. Connect the appropriate plug according to the directions supplied with your amplifier(s) . . . or with other high quality audio equipment designed for use with component record players.

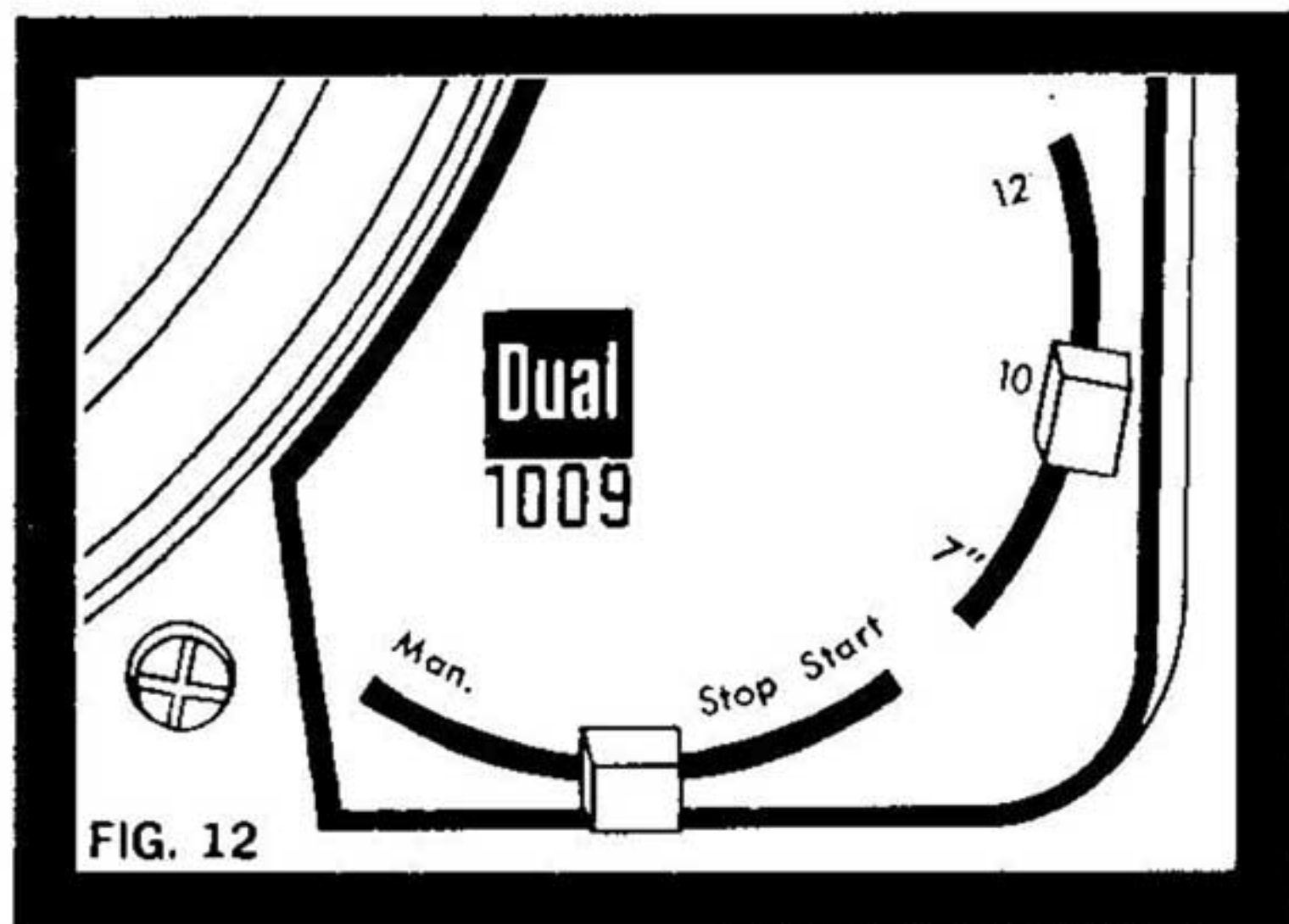


FIG. 12

OPERATING INSTRUCTIONS

SINGLE PLAY TURNTABLE

Use the short spindle. Select the correct speed and record indexing size for the record to be played.

To start automatically, push the slide switch past STOP to START.

To start manually, lift the tonearm, and move it toward the record, then push the switch to MANUAL (this rotates the turntable). Now place the tonearm anywhere on the record. The tonearm can also be placed on the motionless turntable and the switch then pushed to MANUAL. (Note how fast the turntable reaches full speed.)

To interrupt a record in play and begin it over again, push to START.

To stop the record and return the tonearm to its resting post, either push to STOP, or just lift the tonearm and place it on the resting post. Of course, at the end of each record, the tonearm will return to the resting post automatically.

AUTOMATIC CHANGER

Insert the changer spindle, placing the key at its base into the slot and then turning the spindle clockwise until it stops.* Up to ten records of the same size and speed can be stacked at a time. All the records on the spindle can be removed or changed at any time, even while a record is in play.

All the functions for single play can be used in changer operation, plus:

To reject a record during play and change to the next record on the spindle, push to START.

To skip the next record on the spindle, push to STOP. After that record drops, push to START and the following record will go into play.

For continuous repeat of a record on the turntable, remove the other records from the spindle and place the 45-rpm center hole adapter *upside down* on the three-pronged platform.

*If the changer spindle is not seated properly, the next record will not drop, and the tonearm will simply return to its resting post after play. If this happens, turn the spindle clockwise until it stops.

Features You'll Appreciate

HOW THE DUAL 1009 CHANGES RECORDS

The elevator-action changer spindle is another exclusive Dual feature that protects your records against any possible damage such as may occur from the use of pusher arm mechanisms or offset spindles.

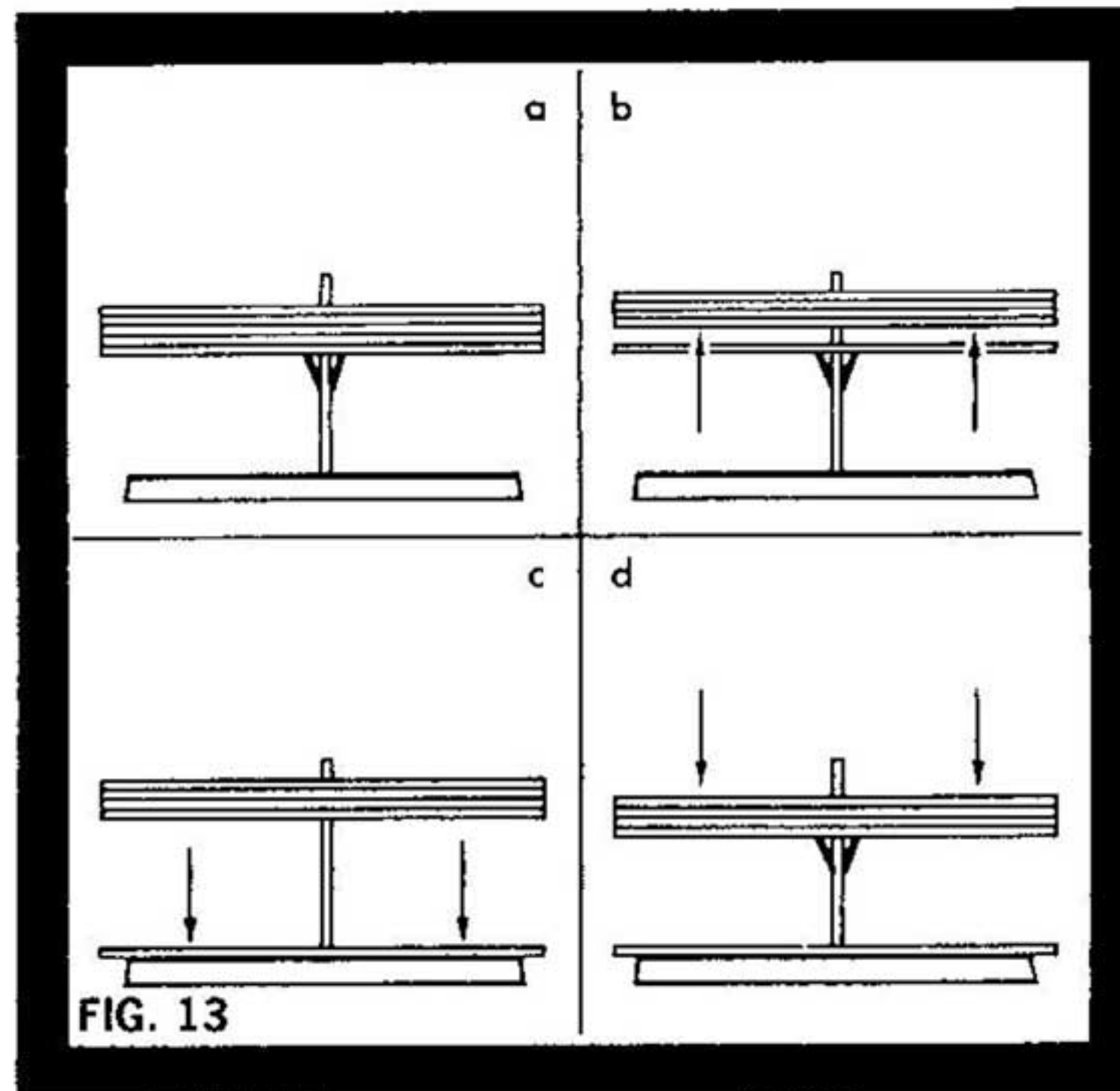


FIG. 13

The entire stack rests upon a three-pronged platform (*fig. 13a*). When the slide switch is pushed to START, the weight of the entire stack is lifted off the bottom record (*b*), which is then released to descend to the turntable (*c*). The stack now lowers (*d*) to await the next change cycle.

This method is foolproof with all records that conform to the international standards of the record industry as to the size and concentricity of the center hole.

VIBRATION-FREE SLIDE SWITCHES

All the operations of the Dual 1009 are activated by smoothly acting slide switches. Unlike push buttons, they do not jar the spring-mounted chassis or induce even momentary vibration. Thus the three spring-mounted footings of the Dual can enjoy a softer, more shock-absorbent characteristic, rather than a compromised stiffness.

SEVEN POUND-PLUS PRECISELY BALANCED TURNTABLE

If you weren't prepared for over seven pounds of turntable, you were probably surprised as you lifted it for the first time. Little wonder, as no other automatic equipment has a motor required to reach full speed virtually instantaneously with such mass (*fig. 14*) and the benefit of the superior flywheel action that contributes importantly to constancy of speed.

The perfect balance of the turntable was painstakingly arrived at by the precisely calculated addition of molten

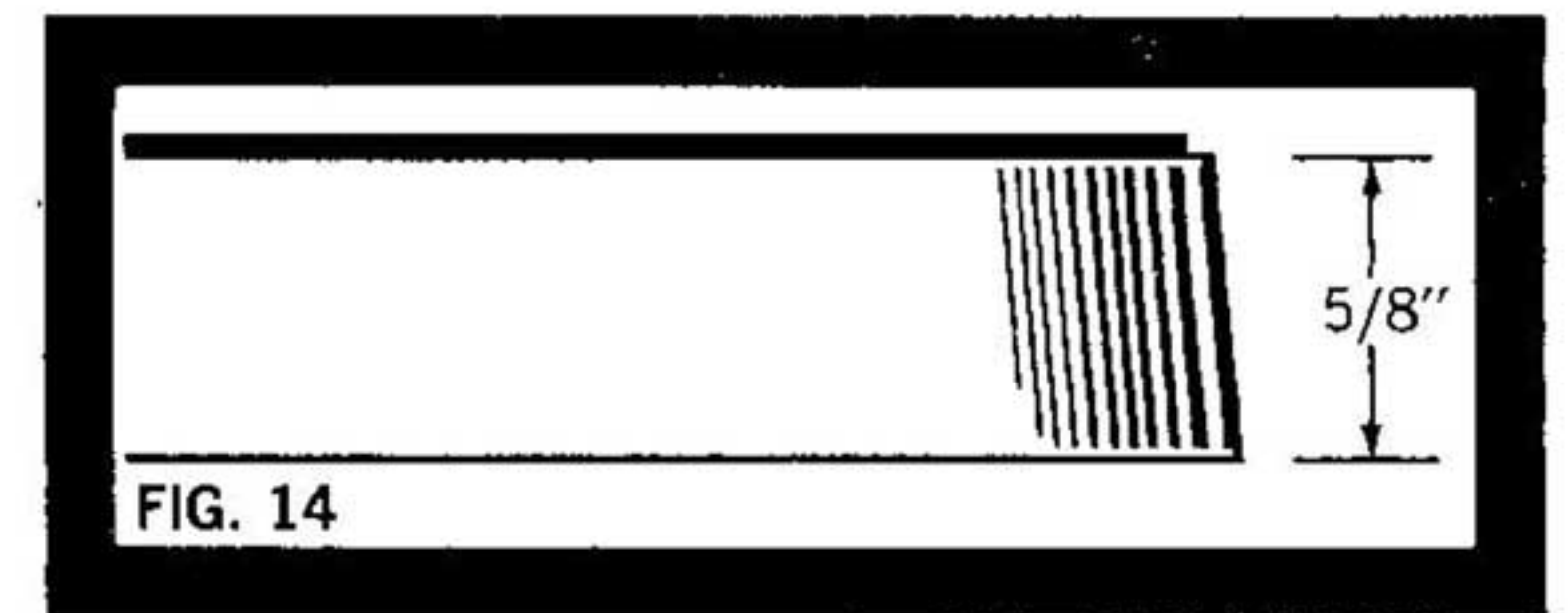


FIG. 14

metal into the specially drilled wells around the bottom rim (*fig. 15*). Twelve wells are provided for this purpose, although only two or three are usually used.

The metal used in the turntable is a non-ferrous alloy, and thus offers no possibility of magnetic interaction with the cartridge.

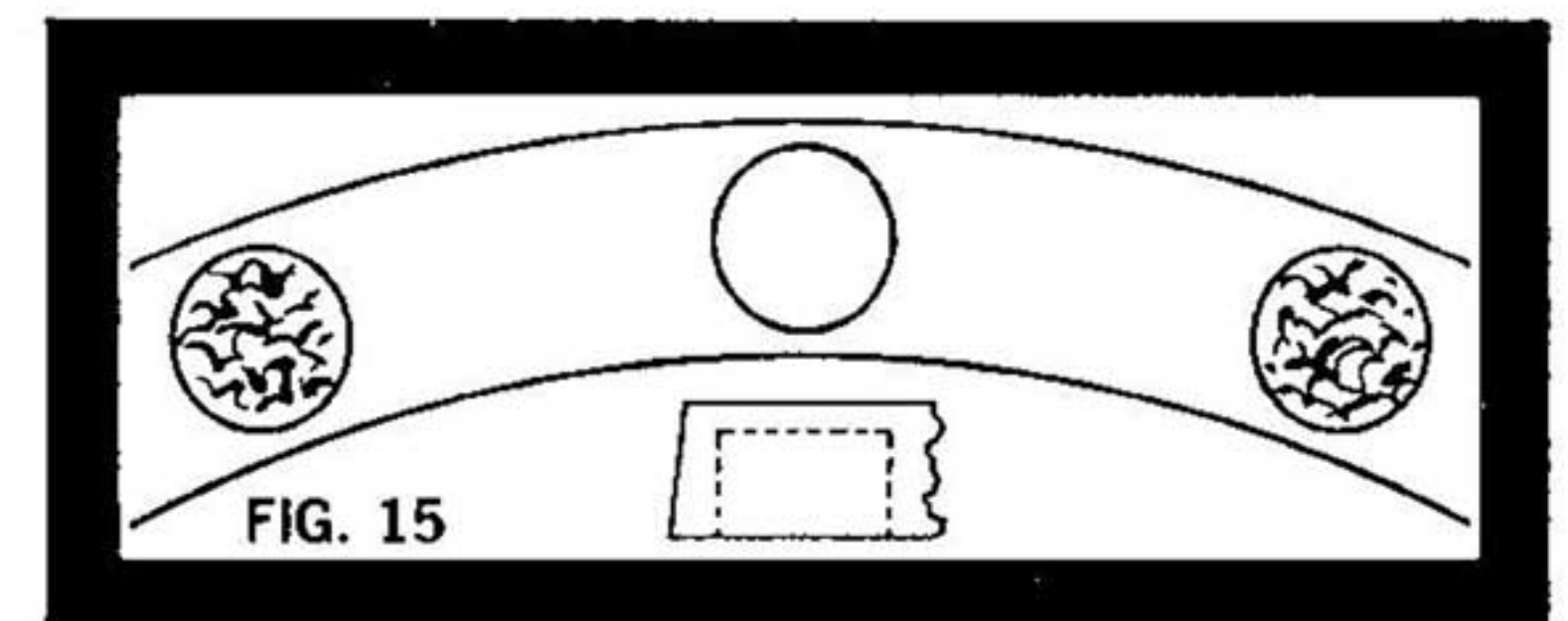


FIG. 15

TRIPPING AT 1/2 GRAM

If you have a high quality cartridge and a new record with smooth run-out grooves you can witness the phenomenon of a tonearm actually tripping at 1/2 gram! Just set the stylus force scale accordingly, and place the tonearm on the record near the center, just outside the run-out groove. Then press the slide switch to MANUAL and watch the effortless tripping performance.

Try this also. Set the scale at zero, and allow the tonearm to float over the record in mid-air. Push to MANUAL to rotate the record, then blow gently on the tonearm from the side . . . just enough to ease it toward the center (*fig. 16*). As your breath alone moves the tonearm, it will again trip and then float gently back. (But because it's at zero, it won't descend to its resting post. When these demonstrations are over, be sure to restore the normal tracking force for your cartridge.)

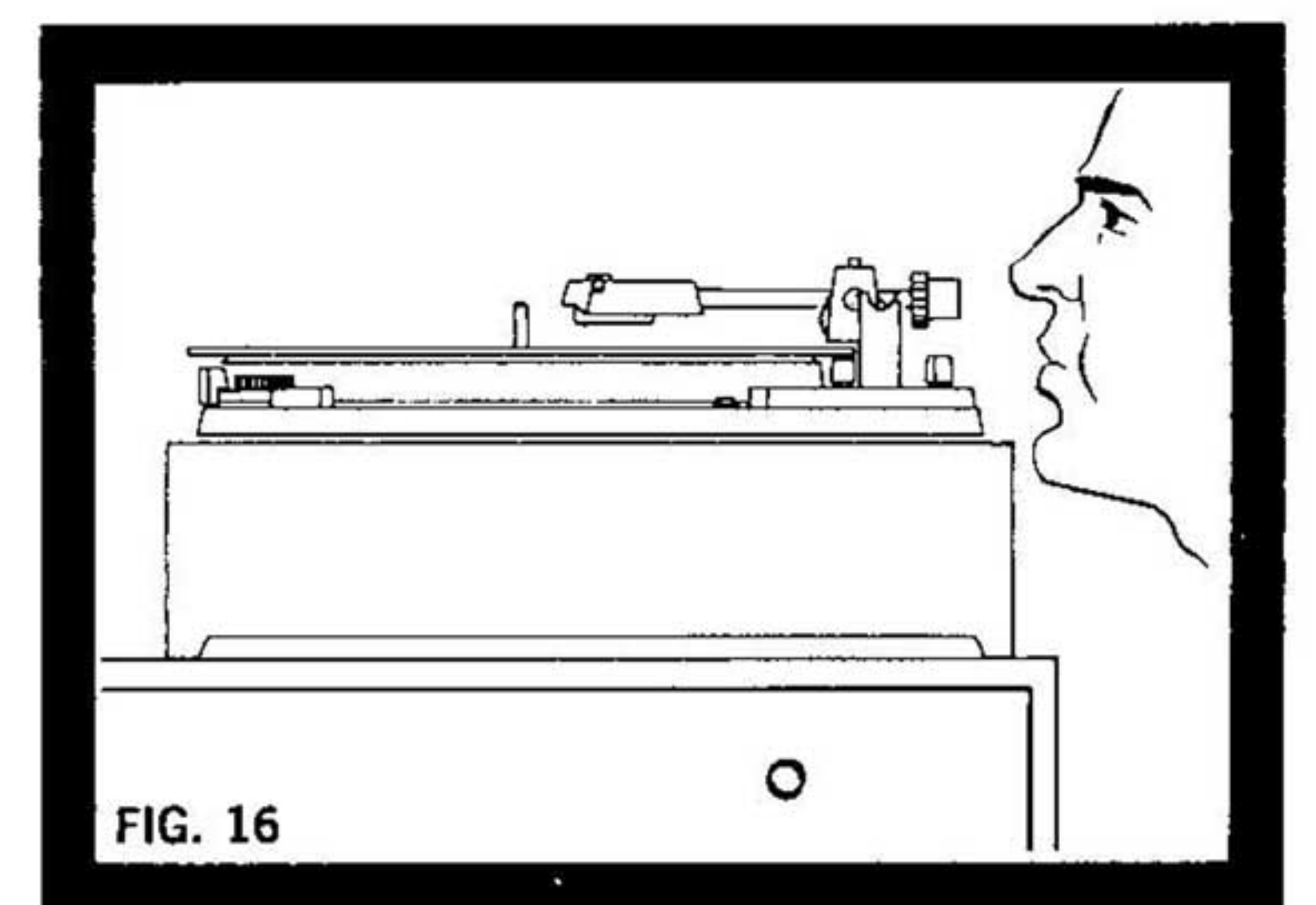
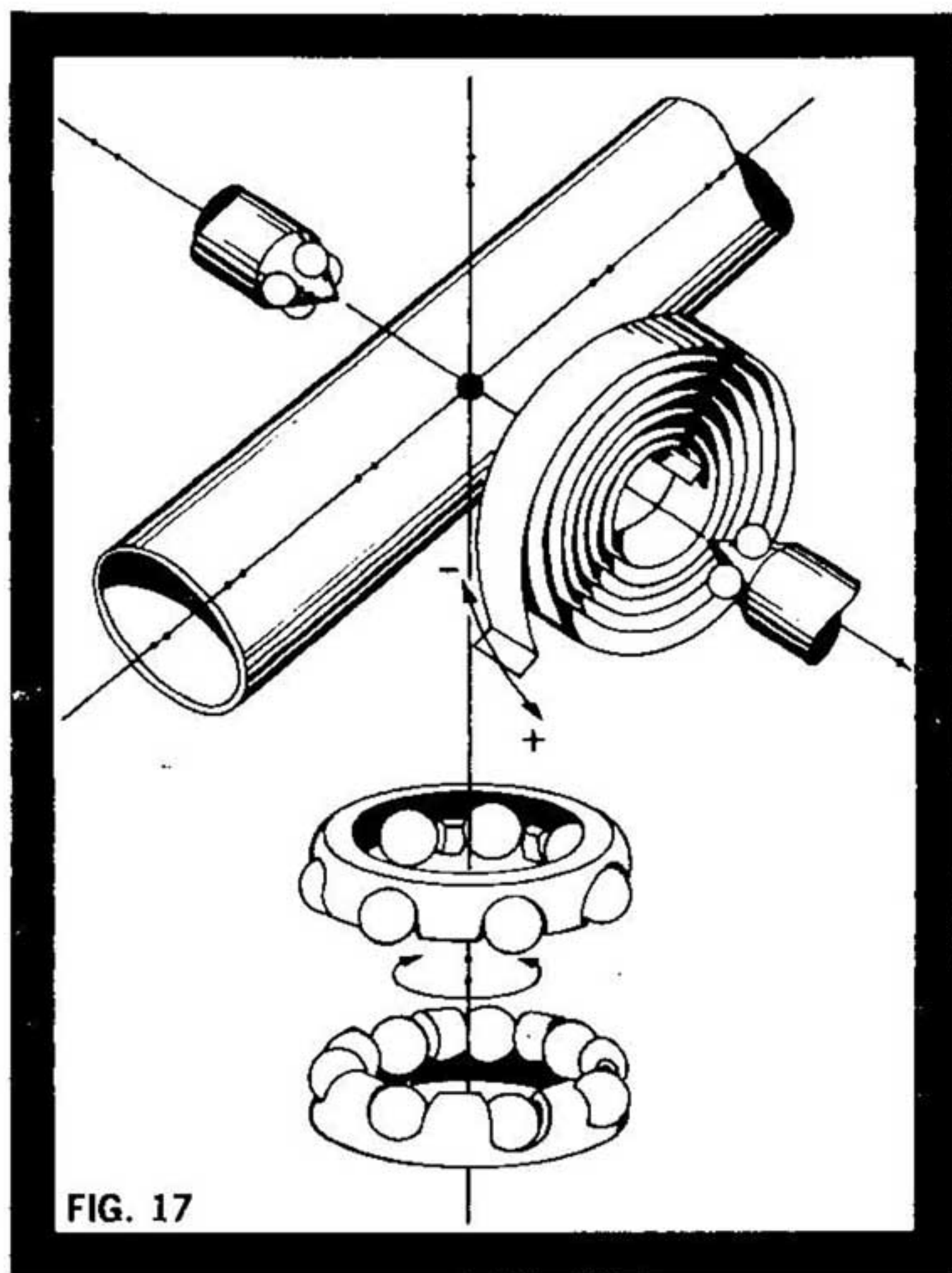


FIG. 16

Once and for all, this should effectively lay to rest the final reservations of the most ardent purist about the automatic tonearm!

Continued on back page

What has made this possible? One, the virtually frictionless pivot point of the tonearm in both the vertical and horizontal planes. For its vertical movement, the tonearm is pivoted on two hardened steel points that are supported by ball bearings. In the horizontal movement, double ball bearing units are used (fig. 17).

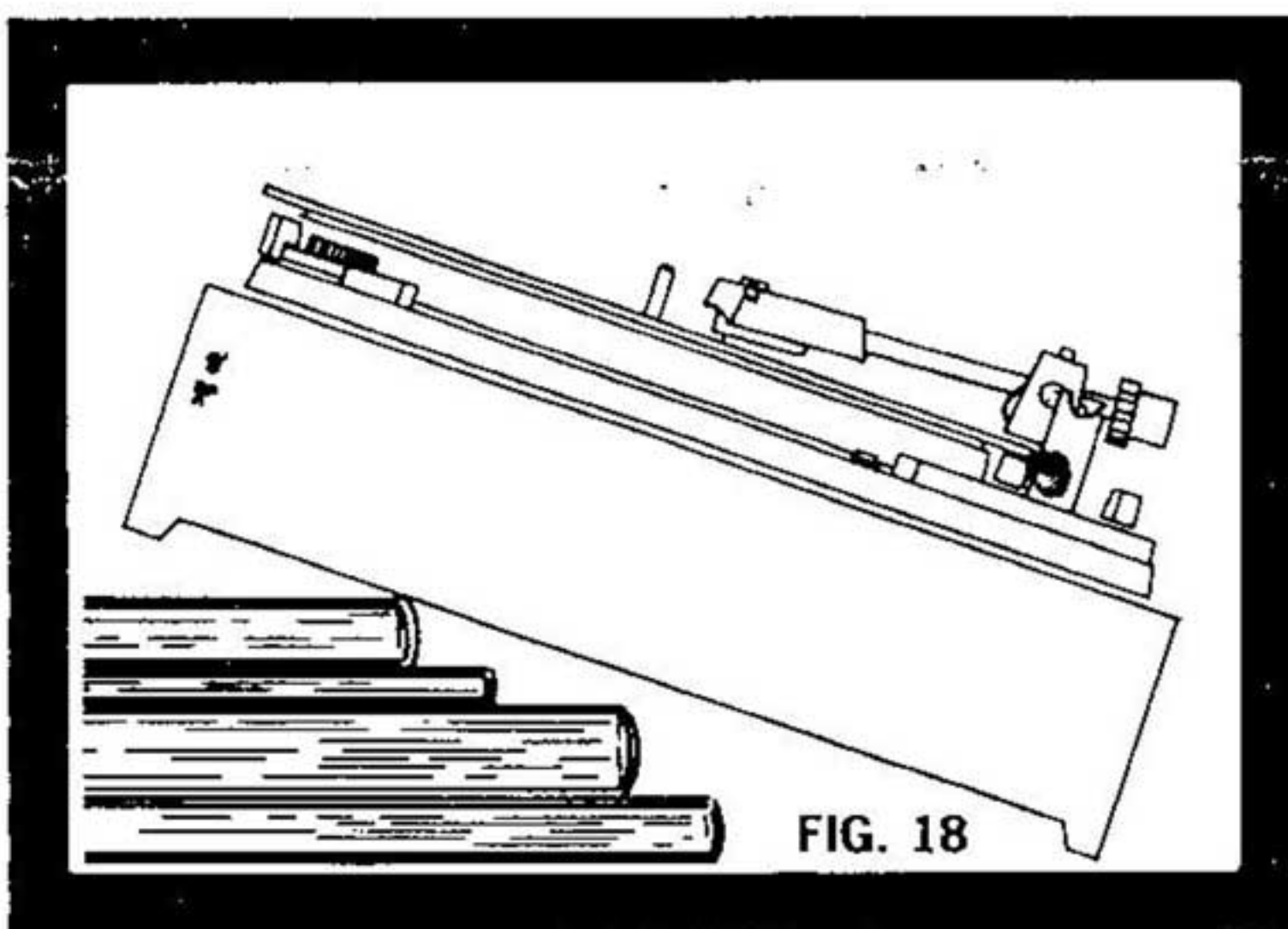


either side of the pivot point. The application of tracking force must then be made from *outside* this mass, *not from unbalancing* the weight by adding or removing weight at either end.

The Dual 1009 maintains its true dynamic balance because the tracking force is induced upon the tonearm from without by means of a multiple-coiled mainspring at the pivot point (fig. 17). The weight of the arm itself remains in constant balance. While to the layman, this may seem to be a distinction without a difference . . . to the physicist, it is a fundamental principle of dynamics.

Here's how you can demonstrate this remarkable advantage. With a 12" 33-rpm record on the turntable and the stylus force at 2 grams, prop the Dual up as shown in fig. 18* at any angle up to 60°! When you push to START, the tonearm will index and track perfectly. (You can even repeat this with the stylus force reduced to 1 gram, and while tracking, the angle can be increased to almost 90°.) Or, without tilting the Dual itself, try placing a cigarette or short pencil between the record and turntable. Again, the tonearm will track perfectly.

**You can actually tilt the Dual from any side except the right, as the free action of the trip lever would then cause it to shift to the center at about 20° tilt. Needless to say, the Dual requires no leveling.*



Two, the tripping action itself is accomplished by a lever which glides freely on a ball bearing toward the center as the tonearm approaches the run-out grooves. The increased velocity of the tonearm when the stylus reaches these grooves brings the lever into feather-light contact with the free-suspension trip switch, and the automatic trip immediately takes over. During play, the tonearm is completely free-floating and may be lifted and moved at any time. Hence, tracking force does not vary at any point on the record. Even during cycling, the tonearm is engaged only by a slip-clutch, and may be restrained against its intended movement without any fear of damage.

TRUE DYNAMIC BALANCE

Not all so-called "dynamically balanced" tonearms actually measure up to that important distinction. Dynamic balance refers to the balance of the tonearm's integral mass on

This is tonearm performance without peer. Needless to say, these demonstrations are suggested only to dramatize the total superiority of the over-all tonearm design . . . and to convince the hitherto unconvinced.

NO ACOUSTIC FEEDBACK

Extraordinary care has also been taken in the less obvious aspects of the Dual's engineering.

Wherever metal-to-metal contact would tend to induce such feedback, it has been scrupulously avoided. For example, the spring-mounted footings are internally cushioned with rubber between spring and cap. The tonearm balance weight is similarly cushioned, as you may have noticed when first handling it. And the motor, of course, is thoroughly insulated against both shock and vibration.

Virtually eliminated is any possibility of acoustic feedback, so annoyingly evident when inferior record playing equipment is used together with high quality components.

MASTER POWER CONTROL FOR AMPLIFIER SHUT-OFF

Your Dual 1009 is equipped with a unique provision for controlling the power to the amplifier, so that the entire system can be switched on and off automatically by the turntable. To take advantage of this special feature (which handles up to 3 amps), consult your Dual dealer or a qualified serviceman.

SERVICING

If your Dual 1009 ever requires servicing, either take it to your Dual audio dealer, or ask him for the address of the nearest Authorized Dual Service Station. Be sure that authentic Dual parts are used whenever replacement is necessary. *Always ship the Dual in its original packaging, or if it has been discarded, write for special shipping instructions.*

DUAL



1009

Auto/Professional Turntable

with dynamically balanced tonearm

Printed in Germany

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UNITED AUDIO PRODUCTS

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