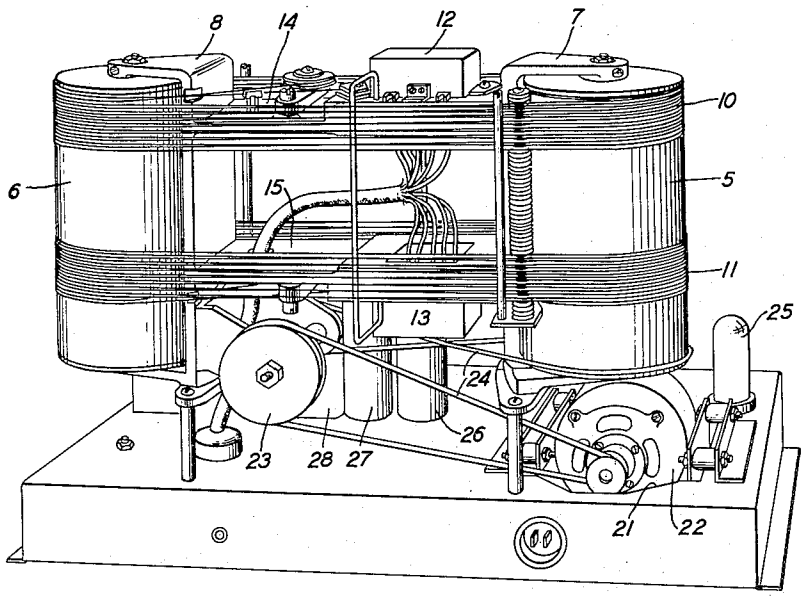
July 23, 1940. O. M. GLUNT 2,209,157

EDUCATIONAL APPARATUS

Filed June 2, 1939

FIG. 1



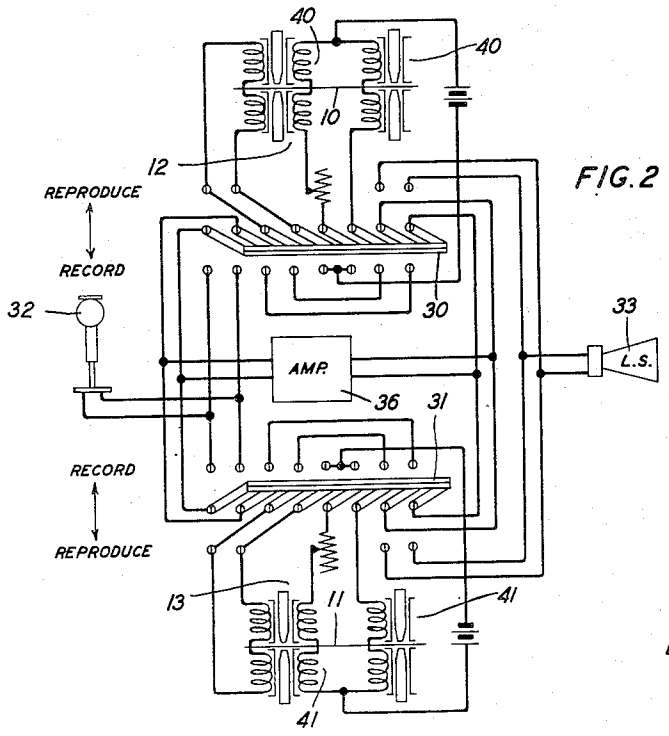


FIG. 2

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EDUCATIONAL APPARATUS

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Application June 2, 1939, Serial No. 276,980

3 Claims. (Cl. 35—1)

This invention relates to apparatus for use in educational work and particularly to a simple inexpensive but efficient sound recording and reproducing mechanism for use in teaching by sound.

In certain types of educational work such as music and languages which are best learned by imitation of a standard it is very desirable to have a recorded standard of sound as well as a recording and reproducing means with which the pupil may make repeated recordings and reproductions for purposes of comparison with the standard sound.

The present day magnetic tape recording methods and apparatus, because of the high quality now attainable and the ease and simplicity with which the recording and reproducing operations using this material may be performed, lend themselves admirably to the educational field.

In order to supply this field with apparatus that will meet all of the requirements and will easily be within a price field to make it available to the most users it is proposed by this invention to construct a recording and reproducing machine comprising two endless magnetic tapes driven synchronously one to contain a recording of the standard, the other constituting the medium upon which the pupil can alternately record and observe his efforts in comparison with the standard sound. Conventional recording and reproducing magnets may be provided in connection with each tape with simple switching means for selectively connecting sound recording-reproducing mechanism with either tape for either recording or reproducing.

It is important that both tapes be driven at exactly the same speed in order that there may be no variations in pitch and for this reason they are preferably mounted to travel in parallel relation over the same pair of drums or reels.

In the drawing, Fig. 1 is a view of an apparatus assembly embodying the features of the invention and Fig. 2 is a circuit schematic of the switching connections.

As shown in Fig. 1, 5 and 6 designate a pair of drums rotatably mounted upon vertical supporting brackets 7 and 8 supported near opposite ends of a hollow metal base 9.

Threaded over the drums 5 and 6 are two endless magnetic tapes 10 and 11 adapted to cooperate with recording and reproducing heads 12 and 13, respectively, mounted upon horizontal plates 14 and 15 supported upon the vertical brackets 7 and 8.

The recording and reproducing heads are stationary on their mountings and in order that the entire length of the endless magnetic tapes 10 and 11 may be passed through these heads without putting an injurious strain upon the tapes and still provide for storage space for several spirals of the tapes disposed axially of the drums each of the tapes is stored on the drums with the spirals in an interlaced relation such that one-half of the length forms a first spiral in one direction axially of the drums 5 and 6 and the remainder of the tape forms a return spiral intermediate the turns of the first spiral. With the tapes 10 and 11 disposed in this manner on the drums 5 and 6, it will be apparent as the drums rotate that any given point in either tape will complete a complete axial cycle of travel on the drums in a complete cycle of longitudinal movement and each active section of tape will be passed through its corresponding recording-reproducing head in substantially a straight line movement from one drum to the other. This feature is disclosed and claimed in a copending application to C. C. Towne, Serial No. 284,155, filed July 13, 1939.

Mounted within a well 21 provided in the metal base 9 is a synchronous driving motor 22 connected by pulleys and belts 23 and 24 with the drum 5. The numerals 25, 26, 27 and 28 designate elements of the amplifier equipment mounted upon the base 9.

As shown in the wiring diagram Fig. 2, the switching equipment required to perform the functions of the recording reproductions necessary to carry out the purpose of the invention comprises two eight-pole double throw switches 30 and 31 that are interconnected with a microphone 32 and a telephone receiver 33 preferably of the loud-speaker type in such a manner that the microphone 32 and the receiver 33 may be interchangeably connected with the two recording and reproducing heads 12 and 13.

In the operation of the system it will be assumed that the upper recorder-reproducer head 12 is the one used by the instructor to produce the sound pattern to be followed while the lower recorder-reproducer 13 is the medium to be used by the pupil.

In the normal operation of the equipment the closure of the switch 30 into its lower position will connect the microphone pick-up 32 through amplifier 36 to the recording-reproducing windings of head 12 so that the tape 10 will receive the voice currents from the microphone 32 representing the instructor's lesson. The reversal of the switch 30 into its lower position discon-

nects the microphone 32 from the input of the amplifier and connects the recording-reproducing head 12 therewith in reproducing position and will connect the output end of the amplifier 36 with the loud-speaking telephone 33 so that the pupil may listen to the matter recorded upon the tape 10.

With the switch 30 in its open or neutral position and the switch 31 in its upper position of operation the microphone 35 will be connected into recording relation with the recording-reproducing head 13 through the amplifier 36 so that the pupil may record on the tape 11.

By moving the switch 31 into its lower position the recorder-reproducer head 13 is connected to the loud-speaker 33 which will permit the pupil to listen to the reproduction of his own recording. By proper manipulation of the switches the pupil can so time his recording and the reproductions of his and the instructor's recordings that the entire recording or any particular portions of it may be brought into the receiver in any timed sequence that he desires.

In the recording positions of the switches 30 and 31 polarizing and depolarizing magnets 40 and 41 are brought into the circuit to erase previously recorded matter and prepare the tape for subsequent recordings.

What is claimed is:

1. An educational apparatus for teaching by sound comprising a magnetic tape upon which is recorded a standard sound, a second magnetic tape adapted to receive a pupil's imitation of the standard sound, recording means cooperating with the second tape, reproducing means selectively connectable to each of the tapes and means for driving the two tapes in synchronism.

2. An educational apparatus for teaching by sound comprising a magnetic tape upon which is recorded a standard sound, a second magnetic tape adapted to receive a pupil's imitation of the standard sound, recording means controlled by the pupil and connectable with the second tape, reproducing means controlled by the pupil and selectively connectable with both tapes and a pair of drums over which both tapes are carried in parallel.

3. An educational apparatus for teaching by sound comprising a magnetic tape upon which is recorded a standard sound, a second magnetic tape, recording means controllable by the pupil and connectable with the second tape, reproducing means controlled by the pupil and selectively connectable with each of the tapes and means driving the two tapes synchronously comprising a pair of drums over which the two tapes are carried in parallel.

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