

Aug. 23, 1932.

V. M. GRAHAM

1,873,879

COMBINED MECHANICAL AND ELECTRICAL RADIO STATION SELECTOR

Filed July 12, 1929

2 Sheets-Sheet 1

FIG. 1.

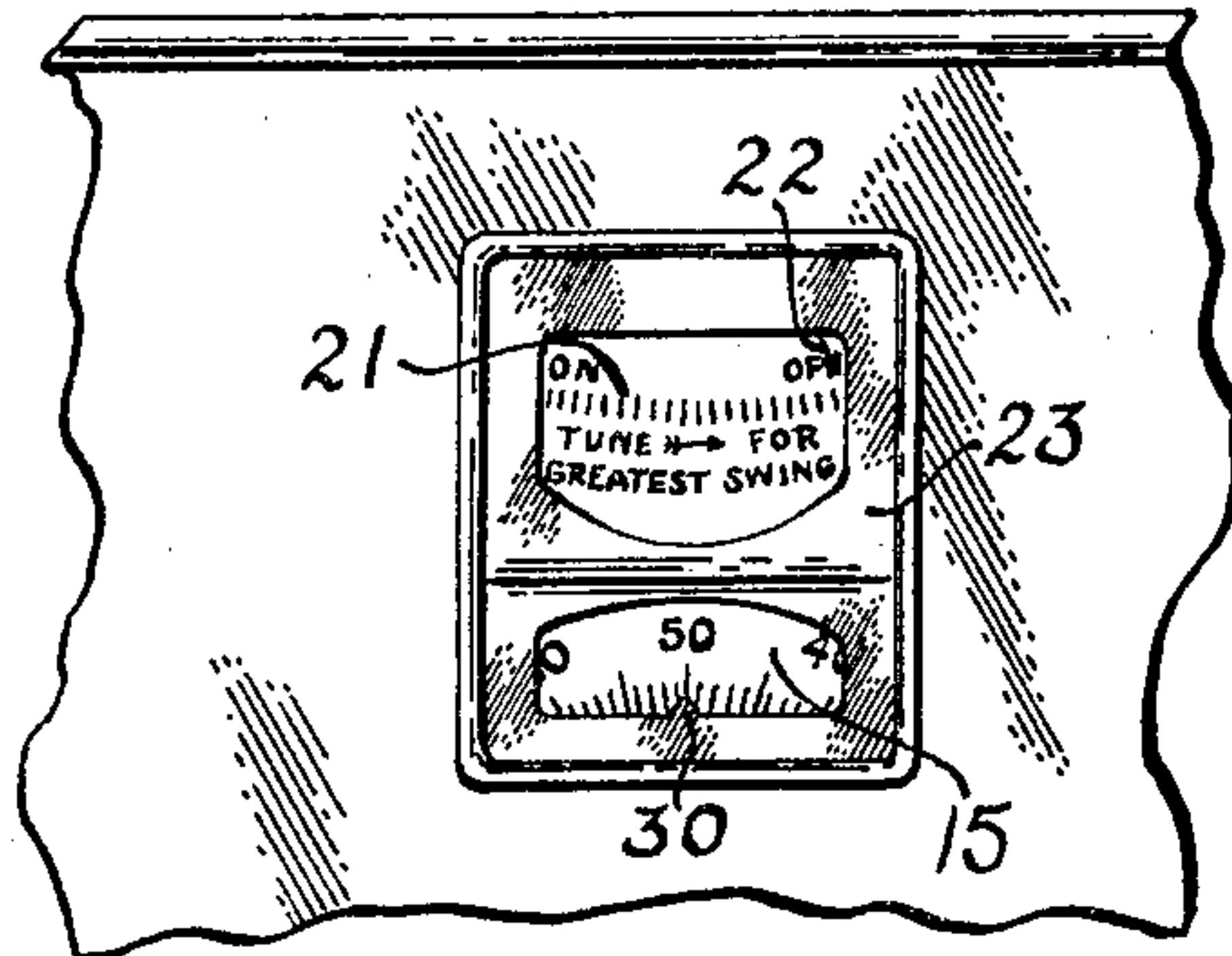


FIG. 2.

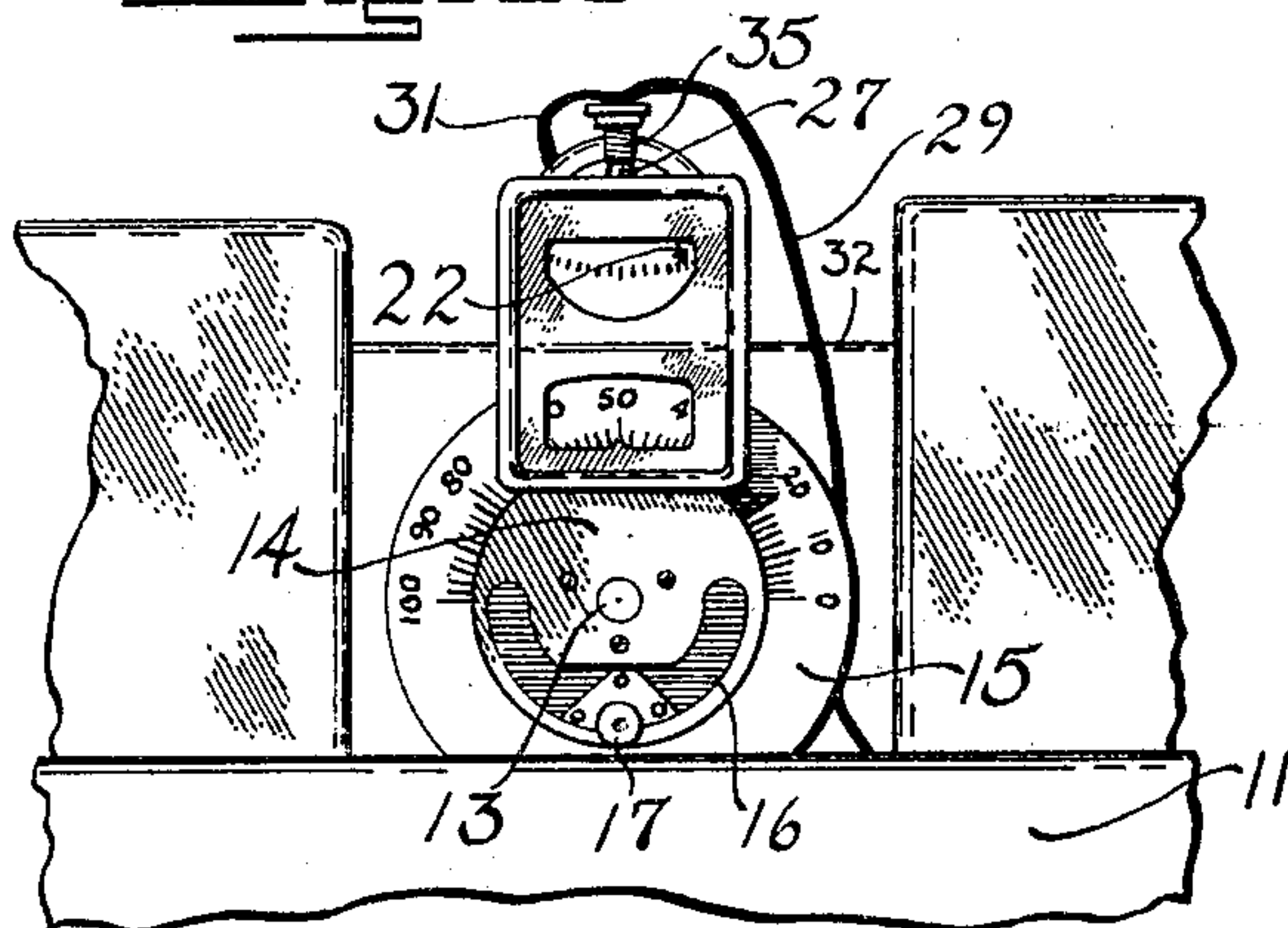
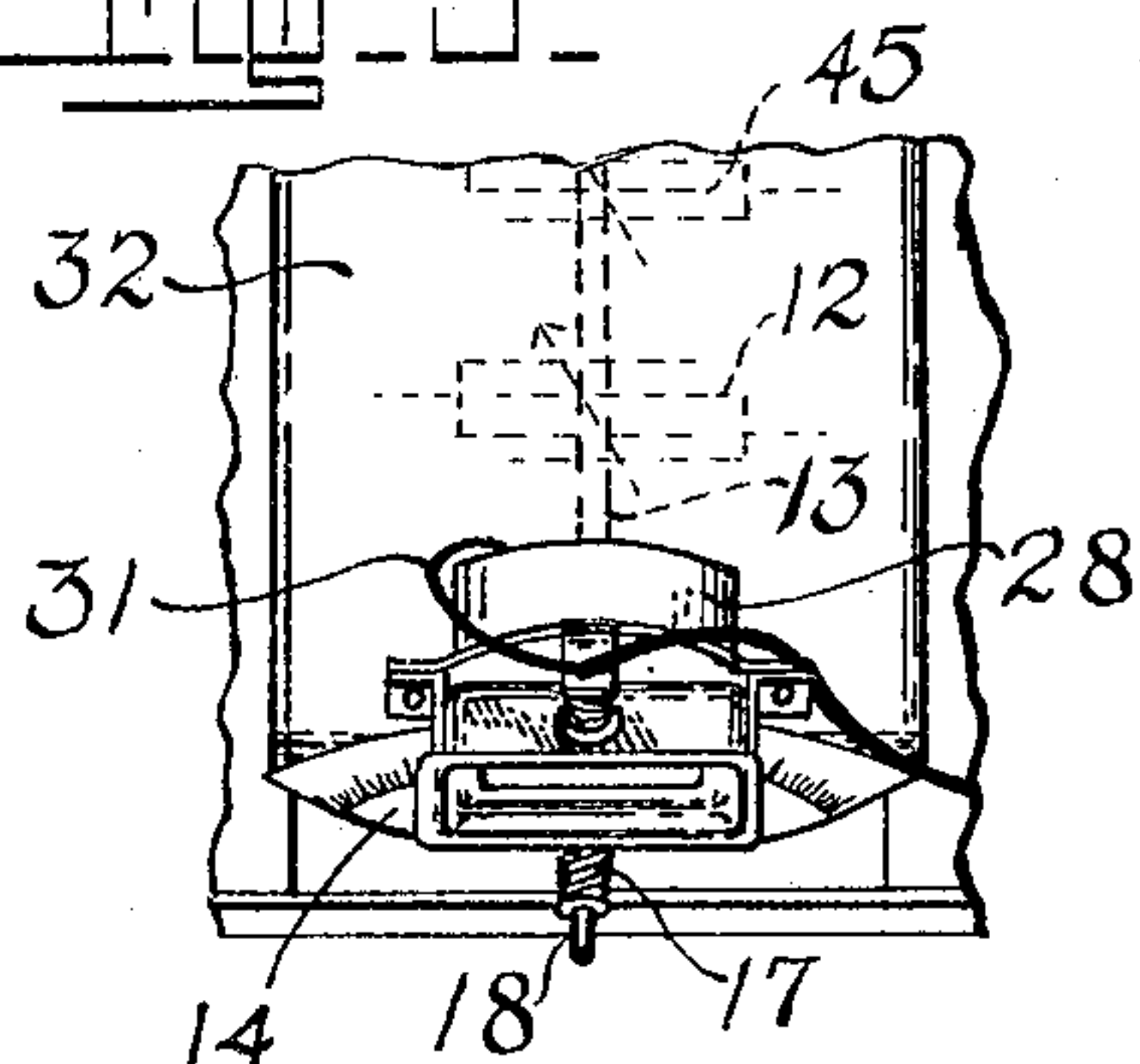


FIG. 3.



Inventor

Virgil M. Graham.

By *A. Clyde Jones.*

Attorney

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Fig. 4

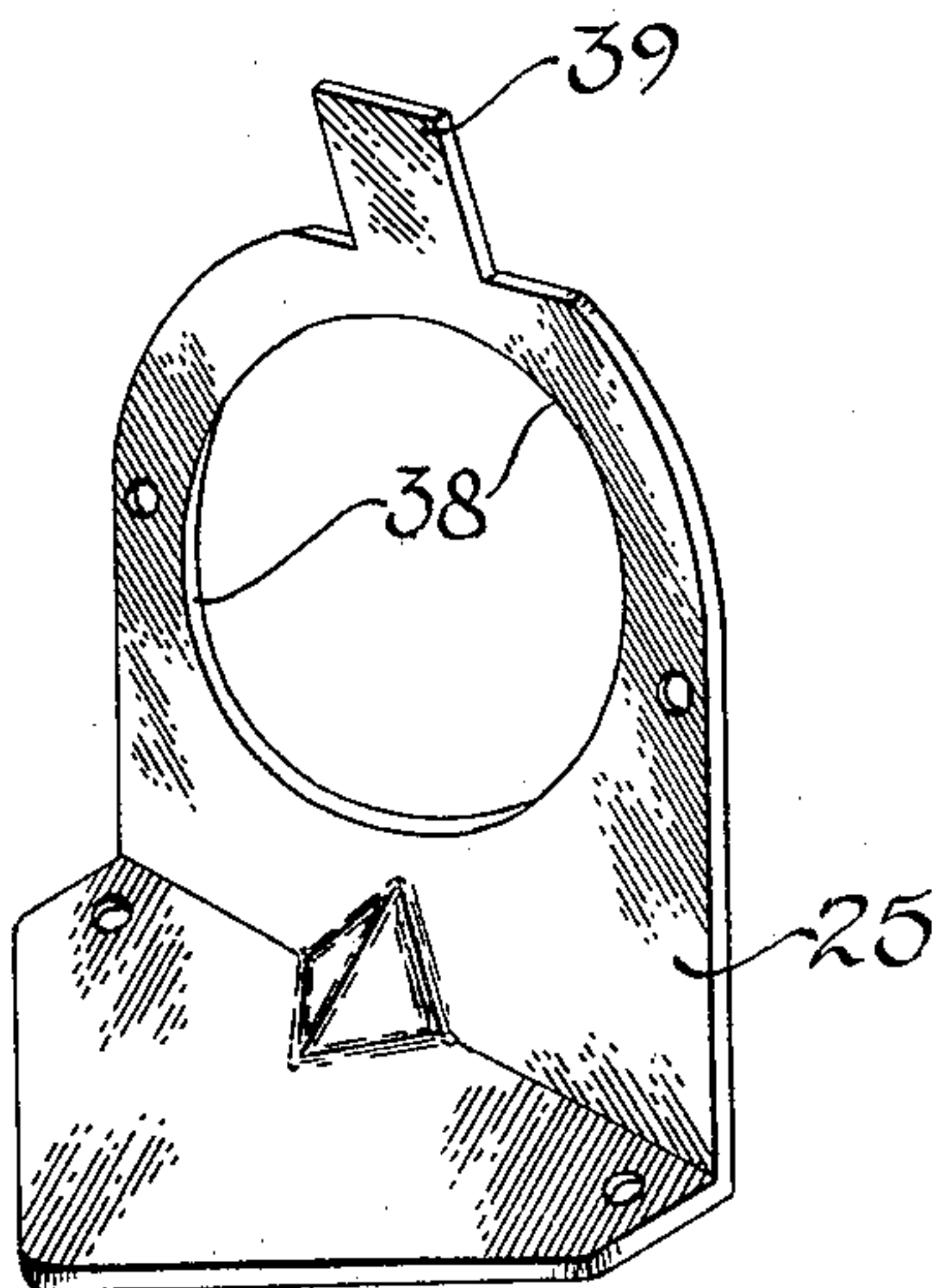
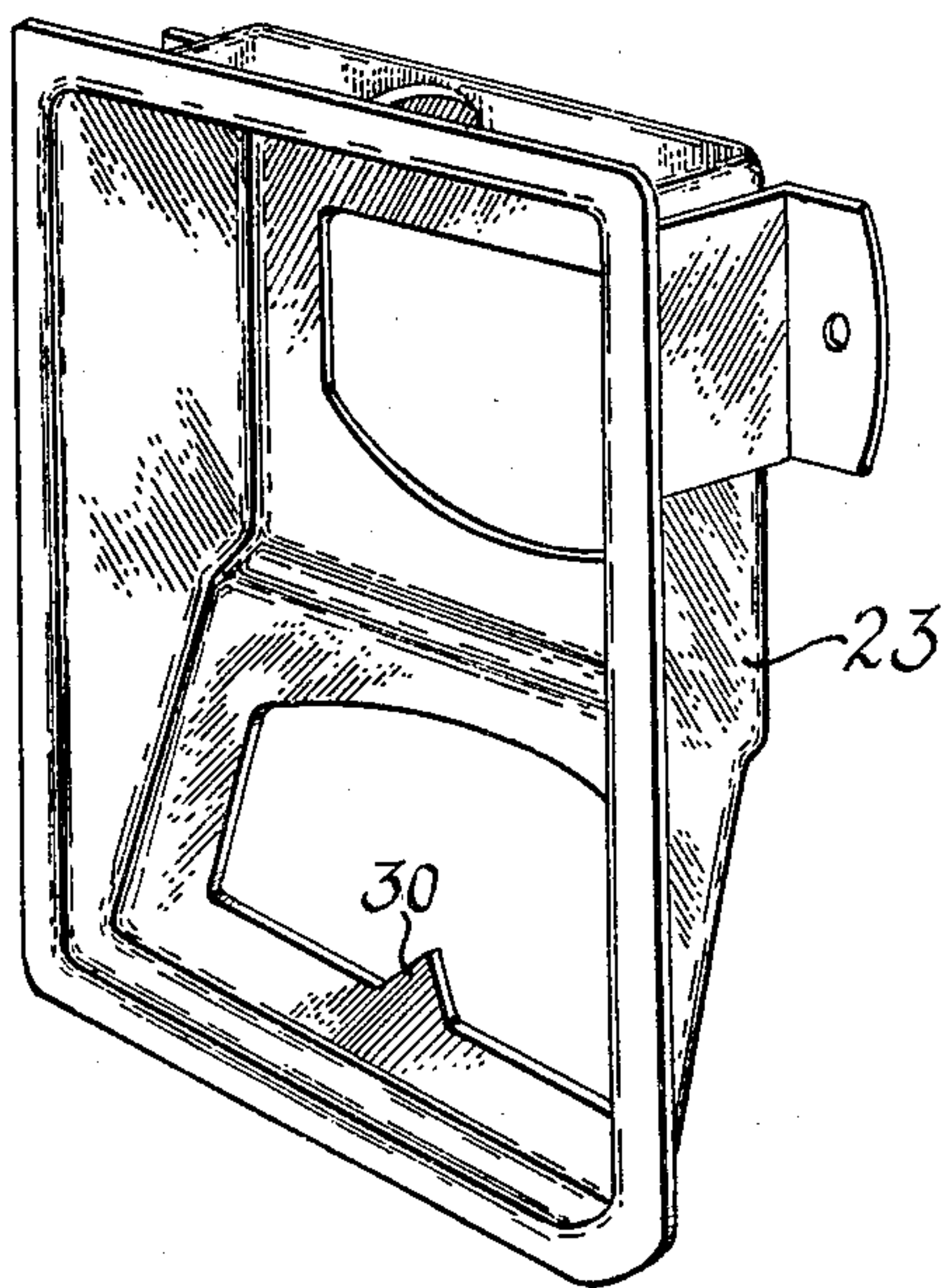


Fig. 5



Inventor
Virgil M. Graham.

By D. Clyde Jones.

Attorney

UNITED STATES PATENT OFFICE

VIRGIL M. GRAHAM, OF ROCHESTER, NEW YORK, ASSIGNOR TO THE STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY, OF ROCHESTER, NEW YORK, A CORPORATION OF NEW YORK

COMBINED MECHANICAL AND ELECTRICAL RADIO STATION SELECTOR

Application filed July 12, 1929. Serial No. 377,876.

This invention relates to radio signaling systems and more particularly to a combined mechanical selector and an electrical selector for showing when a radio receiver is exactly tuned to a desired radio station.

In my co-pending application, Serial No. 374,309, filed June 28, 1929, I have shown the electrical circuits of a radio receiver in which a plurality of capacitors actuated from a common control are employed to adjust the tuning of the various stages thereof into resonance with the signals of a desired program. In all such radio receivers it is common to provide a mechanical indicator in the form of a dial either mounted on the common control shaft of the tuning capacitors or actuated therewith to indicate the "coarse" tuning of the several stages and the "fine" or accurate tuning is effected by adjusting the common shaft until the maximum volume of the desired signal is heard. In the radio receiver of the mentioned application, however, there is provided an automatic volume control whereby all signals above a certain intensity are reproduced at a predetermined volume level irrespective of whether the signals are weak or strong. In such an arrangement it is not possible to obtain exact tuning by listening for the maximum signal because the automatic volume control prevents the signal volume from exceeding a certain amount and it is therefore necessary to employ an electrical meter or indicating device to show when the radio receiver is tuned into exact resonance with the desired incoming signal. Since it is necessary to depend on the mechanical indicator for showing the "coarse" tuning adjustment and to rely on the electrical meter for the "fine" or exact tuning it is essential that these two indicators be simultaneously visible.

In the past it has been proposed to place these indicators at some little distance apart because of the fact that it is convenient mechanically and electrically to do so. However, when these indicators are thus spaced apart it is impossible for the person tuning the radio receiver to observe both of them at the same time so that it is necessary for him to transfer his gaze first from one indicator

to the other until the exact desired tuning is effected.

It has been discovered that if the graduations on the mechanical dial and on the electrical dial extend in the same general direction and especially if the needle or moveable element points in the same general direction as the graduations on the dial, the simultaneous reading of these two indicators is more easily accomplished.

In accordance with the present invention it is therefore proposed to mount the mechanical indicator and the electrical indicator as near to each other as possible with their graduations in the same plane or in parallel planes. Another feature of the invention includes a common source of indirect illumination for lighting the dials of both the indicators. A further feature includes the mounting of the common escutcheon plate for the mechanical indicator and electrical indicator on the support for the electrical indicator.

For a clearer understanding of the invention reference is made to the drawings in which Fig. 1 is a front view of a portion of the panel of a radio receiver in which there is mounted combined mechanical and electrical indicators of the present arrangement; Fig. 2 is a front view of a portion of the chassis of a radio receiver with the panel removed to more clearly indicate the structure and mounting of the combined indicators; Fig. 3 is a top prospective view of a portion of the chassis shown in Fig. 2; Fig. 4 is a prospective rear view of the escutcheon plate; and Fig. 5 is a bracket to be mounted on a portion of the chassis and serving to support the electrical indicator and the common escutcheon plate.

In my mentioned co-pending application there is diagrammatically represented capacitors 12, 45, etc. mounted on the frame 11 of the chassis of a radio receiver and functioning to tune the respective amplifying stages of this receiver. Such capacitors, indicated in Fig. 3 of the present disclosure, have their rotors mounted on a common shaft 13 on the front end of which there is secured a flat disc 14 having its beveled edge 15 serving as a dial provided with a uniformly

marked scale and suitable numbering which may be arbitrarily chosen or which may indicate wave lengths or kilocycles to which the receiver may be tuned by the adjustment of the mentioned capacitors. This disc is also provided with an internal arcuate slot 16, the lower edge of which is frictionally engaged by a spring pressed clutch 17 provided on a stub shaft 18 which is supported on a part of the chassis and terminates in a knob or handle (not shown). By this arrangement a very large rotation of the shaft 18 through the agency of the dial 15 causes a relatively small rotation of the shaft 13.

In my mentioned application, in addition to the dial 15, there is provided an electrical meter 28 which indicates by the maximum swing of its needle 22 over a scale 21, when the radio receiver is exactly tuned to the desired station. This electrical meter is necessary since the circuit arrangement of my previous invention includes an automatic volume control by which all signals above a certain value are automatically held to a predetermined volume level. Because of this arrangement it is no longer possible exactly to tune a radio receiver by operating the mechanical adjustments of the tuning capacitors including the dial 15 until the loudest signal is obtained from the desired station and consequently the electrical method of indicating exact tuning becomes essential. The electrical meter 28, which may be of any well-known type, is mounted in the bracket 25 secured on the top of the enclosing shield 32 for the previously mentioned capacitors. This bracket has a circular opening 38 in which the meter 28 may be inserted while an escutcheon plate 23 (shown in Fig. 5) is secured to the front of the bracket by screws to hold the electrical meter in place. This escutcheon plate has two openings through one of which the electrical meter is visible and through the other opening 36 a portion of the circular dial 15 can be observed. The bracket is also provided with an extension 39 in line with an opening 38 in the top of the escutcheon plate so that a small lamp socket 35 may be detachably supported thereon. A lamp 27, screwed into this socket, may extend into the opening to illuminate both of the dials visible through the escutcheon plate. 29 represents the conductors leading to the electrical meter while the conductors 31 furnish current for lighting the lamp 27.

It is believed that a description of the method of selecting a station will be helpful to a clearer understanding of the invention. Let it be assumed that the graduation "50" on dial 15 of the mechanical disc corresponds to the "coarse" tuning of the receiver to the desired station. The dial is then rotated by means of the stub shaft 18 until this graduation registers with pointer 30, thereafter the dial is turned first slightly to the right and

then to the left while the operator observes the movement of the meter needle 22. When the maximum swing of this needle is noted, the rotation of the disc 14 is stopped, at which time the radio receiver is exactly tuned to the desired station. From this description of the operation it will be appreciated that the operator must observe the readings on the disc 14 and also on the dial 21 of the meter. Preferably these readings are made at the same time and unless these members are placed in the relation shown in this disclosure it is necessary for the person tuning the radio receiver to transfer his gaze back and forth between these two elements, an awkward, undesirable procedure; whereas with the present arrangement these elements are so placed that they are both observable at the same time. This is due to the fact that the operator may inspect the scale of the dial 15 by direct macular vision and the moving needle 22 by indirect vision since the human eye is so constituted that it can distinguish movement of an object without focusing the eyes directly upon it. In this way it is possible to obtain these two indications simultaneously with a minimum adjustment of the accommodation of the eyes.

What I claim is:

1. In combination with the chassis of a radio receiver including a variable capacitor, means for adjusting said capacitor, a dial movable with said adjusting means, a bracket mounted on said chassis above said dial, an electrical meter mounted on said bracket, an escutcheon plate mounted on said bracket, said escutcheon plate having two openings through one of which said dial is visible, and through the other said meter is visible.

2. In combination with the chassis of a radio receiver including a variable capacitor, means for adjusting said capacitor, a dial movable with said adjusting means, a bracket mounted on said chassis above said dial, an electrical meter mounted on said bracket, an escutcheon plate mounted on said bracket, said escutcheon plate having two openings through one of which said dial is visible, through the other opening of which said meter is visible, and a light mounted on said bracket for illuminating said openings.

3. In combination with a chassis of a radio receiver including an adjustable tuning element, means for adjusting said tuning element, an indicator movable with said adjusting means, an electrical meter mounted in vertical physical relation with respect to said indicator, and an escutcheon plate supported adjacent said chassis, said escutcheon plate having two openings positioned one above the other, through one of which openings said indicator is visible and through the other of which said meter is visible.

4. In combination with a chassis of a radio receiver including an adjustable tun-

ing element, means for adjusting said tuning element, a dial movable with said adjusting means, a bracket mounted on said chassis in vertical relation with respect to said dial, an electrical meter mounted on said bracket, an escutcheon plate supported adjacent said chassis, said escutcheon plate having two openings positioned one above the other, through one of which openings said dial is visible, and through the other of which said meter is visible, and a lamp supported on said chassis for illuminating both of said openings.

5. In combination with a chassis of a radio receiver including an adjustable tuning element, means for adjusting said element, a mechanical indicator movable with said adjusting means, an electrically operated indicator closely associated with said mechanical indicator, and an escutcheon plate supported adjacent said chassis, said escutcheon plate having two openings positioned one above the other, through one of which openings said mechanical indicator is visible, and through the other of which said electrical indicator is visible.

In witness whereof, I hereunto subscribe my name this 10th day of July A. D. 1929.

VIRGIL M. GRAHAM.