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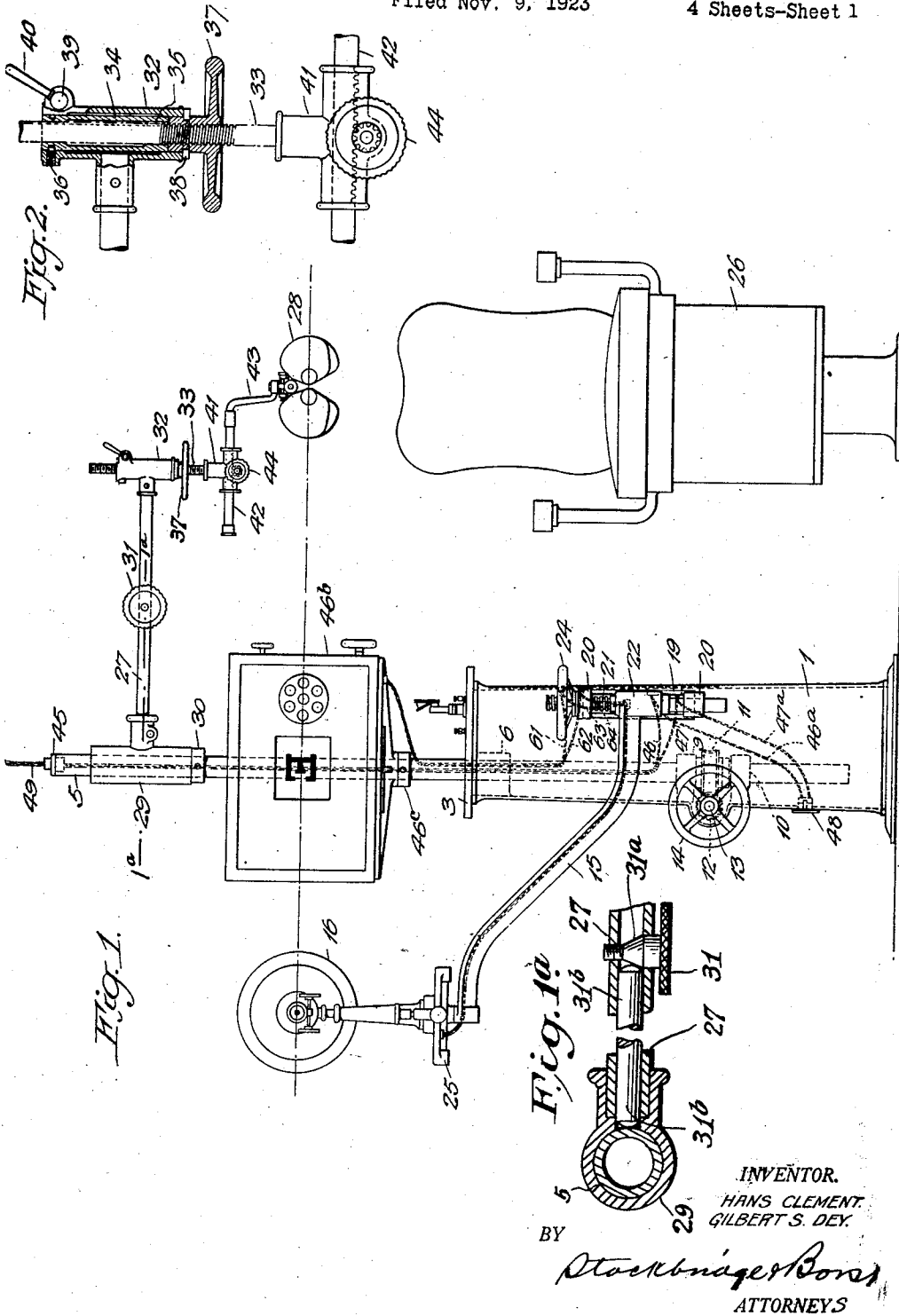
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H. CLEMENT ET AL

OPHTHALMOLOGICAL APPARATUS

Filed Nov. 9, 1923

4 Sheets-Sheet 1



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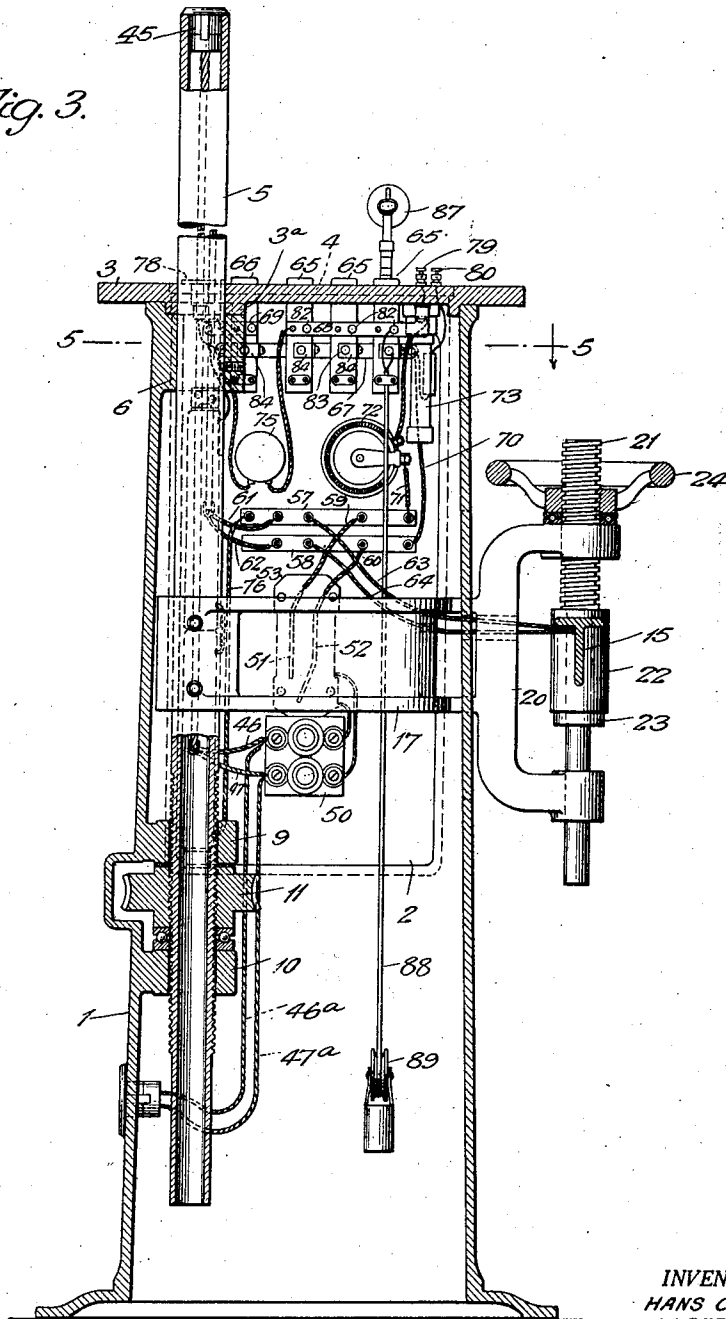
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Fig. 3.



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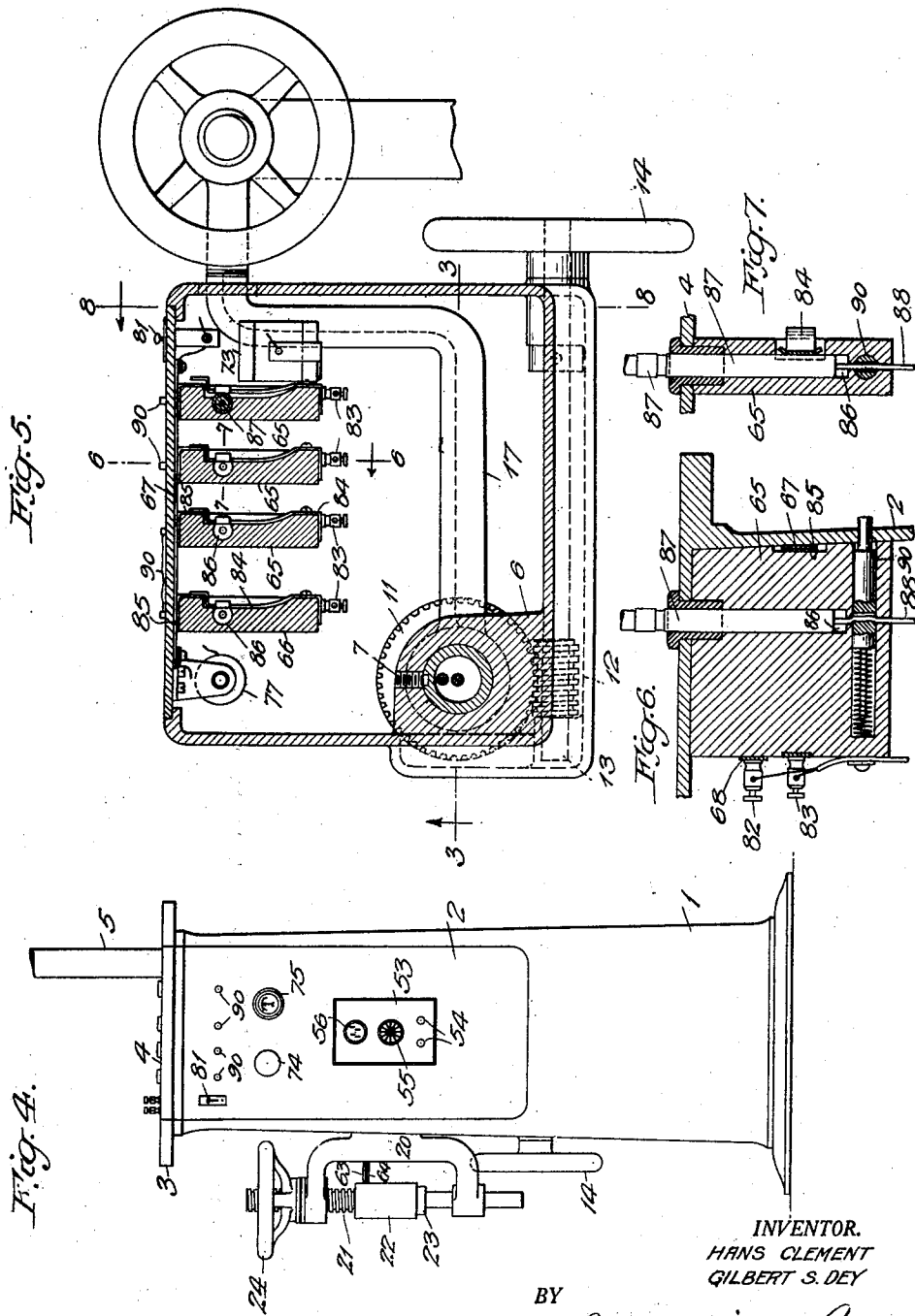
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OPHTHALMOLOGICAL APPARATUS

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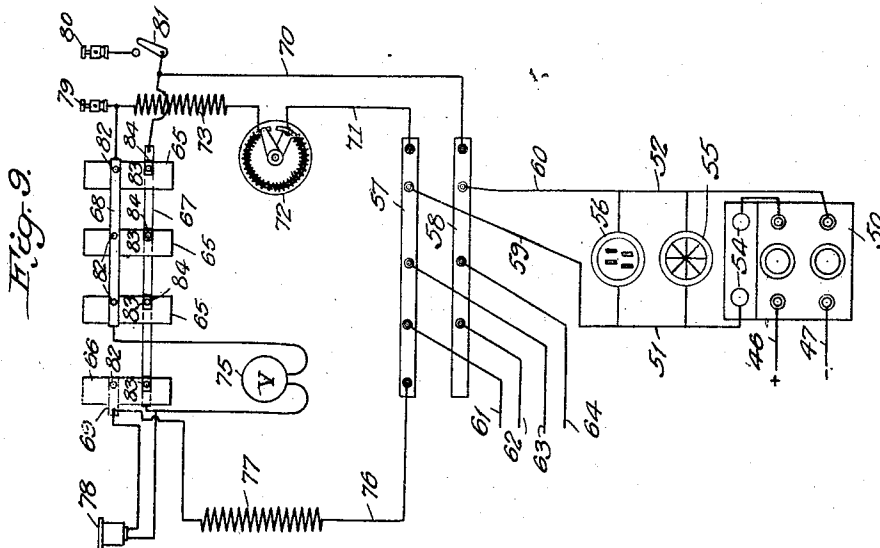
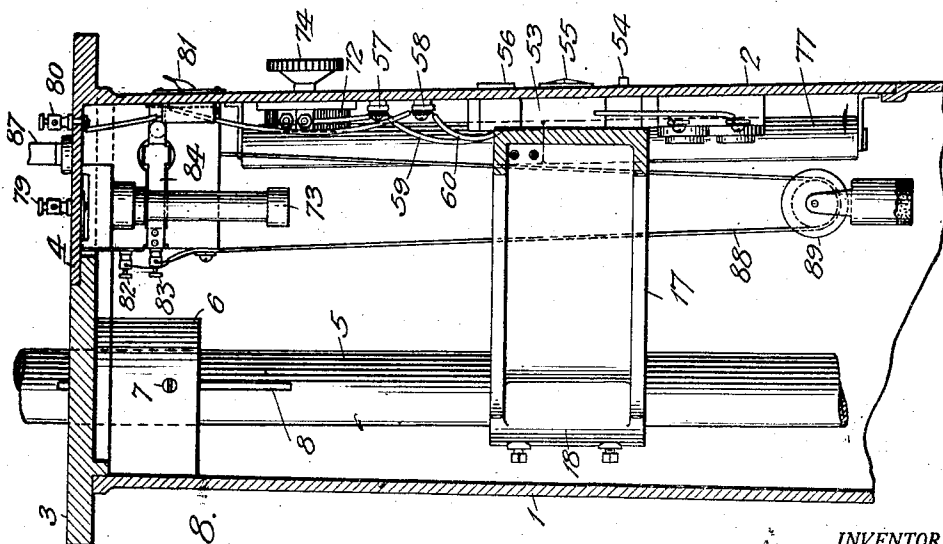
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OPHTHALMOLOGICAL APPARATUS

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4 Sheets-Sheet 4



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Patented Apr. 19, 1927.

1,625,075

UNITED STATES PATENT OFFICE.

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OPHTHALMOLOGICAL APPARATUS.

Application filed November 9, 1923. Serial No. 673,728.

Our invention relates to ophthalmological apparatus and has particular reference to stands or similar structures adapted to support in one unitary assembly or group all of the diagnostic instruments which will ordinarily be employed in making a thorough optical examination, this invention being an improvement upon the apparatus disclosed in the Patent No. 1,491,666, issued May 20, 1924, to Hans Clement, one of the co-applicants of this application.

By reason of a requirement of division made by the Patent Office, a divisional application, Serial No. 140,797, filed October 11, 1926, is directed more particularly to the supporting stand construction of our invention, to the exclusion of the electrical features claimed herein.

An object of our invention is to provide a device of this sort which will be relatively simple and compact and which will provide a rigid support for the larger instruments and also provide convenient attachment and support for the smaller diagnostic instruments in such a manner that all of the instruments may conveniently be brought successively to one point for examination before the eyes of the patient without fatigue to the patient or loss of time.

We preferably employ with our apparatus a suitable current controller which will permit of the use of the regular city current for illuminating the small as well as the larger diagnostic instruments, and our invention contemplates an arrangement for leading in the current and for supporting the current controlling devices wherein they are concealed while at the same time rendering the controlling devices conveniently operable by the refractionist.

Our invention also contemplates convenient means for holding the small instruments when not in use in such a way that the current is automatically cut off therefrom by the act of placing them in their holders, as well as means for automatically retracting their attaching cables or cords as the small instruments are returned to their places, while permitting ready withdrawal thereof.

Other objects and advantages of our invention will appear from the description herein of the particular embodiment of our

invention illustrated in the accompanying drawings.

In accordance with our invention, we provide an enclosed compartment or cabinet which serves as the base of the device and which supports a vertically adjustable standard carrying one or more arms arranged to swing on vertical axes. On the ends of these arms are supports for the large instruments, such as an ophthalmometer and a refractor or other phoro-optometer. By adjusting the standard these instruments may be simultaneously raised or lowered, and means are also preferably provided for independently raising or lowering at least one of the arms, and for horizontally adjusting one of the instrument supports. In this way the two instruments may be so adjusted that they can be brought around to the same examination point. We also preferably provide on the standard a suitable test chart in line with the refractor so faced as to enable the patient to see the reflection thereof in a mirror in front of the patient.

Within the base cabinet are contained the current controlling devices, the operating knobs or handles for which are disposed on an exterior face of the cabinet. Current may be led in through the base or the lead-in wires may conveniently enter through the standard which will be made hollow for this purpose. Current is led from the current controlling devices by wires neatly arranged leading to the ophthalmometer and to the test chart.

The small instruments may be attached to binding posts on the top of the cabinet or their cords may be attached to terminals within the cabinet and have a slidable weight thereon tending to retract the cords within the cabinet. Preferably in that case a clamp device will be employed which will permit the ready withdrawal of the cord but which will hold the cord against the pull of the weight in any position to which the cord is withdrawn and which may be readily released to allow the weight to pull the cord back as the instrument is returned to its place on the cabinet.

As a convenient support for the small instruments we employ for each one a jack, preferably in the top of the cabinet, in which the lower end of the instrument is to be

inserted, and which includes an automatic switch which is opened by the instrument as it enters the jack, thereby cutting off the current from the lamp of the instrument when not in use.

Our invention includes other features of construction and details and arrangements of parts, as will hereinafter more fully appear. We shall now describe the illustrated embodiment of our invention and shall thereafter point out our invention in claims.

Fig. 1 is an elevation of a complete apparatus embodying our invention;

Fig. 1^a is an enlarged horizontal section taken on line 1^a—1^a of Figure 1;

Fig. 2 is an enlarged detail in sectional elevation of the vertical adjusting means for the refractor support;

Fig. 3 is an enlarged sectional elevation of the base cabinet taken on line 3—3 of Figure 5;

Fig. 4 is an elevation of the base cabinet as viewed from the right in Figure 1;

Fig. 5 is a horizontal section of the same taken on line 5—5 of Figure 3;

Fig. 6 is an enlarged sectional detail of one of the jacks taken on line 6—6 of Figure 5;

Fig. 7 is a transverse section of the same on line 7—7 of Figure 5;

Fig. 8 is an enlarged sectional elevation of the upper part of the base cabinet taken on line 8—8 of Figure 5;

Fig. 9 is a diagram of the electrical circuits.

The enclosed compartment or cabinet 1 serves as the base for the apparatus. This cabinet is shown as rectangular in cross section and is composed of cast iron or other suitable material. It is in form an elongated box standing on end and open at both its top and bottom, three of the walls being solid and the fourth wall being provided from its top for more than half of its length with an opening, in which is set a suitable panel 2 carrying the current controlling apparatus, as will be hereinafter described. The top 3 of the cabinet is a removable rectangular plate, a portion of which is cut out on one side to receive a top panel portion 4 which is a right angle extension of the panel 2 and forms a flush continuation of the surface of the top 3, certain of the electrical parts being also carried by this top panel portion 4, as will hereinafter appear.

Entering through a hole provided in the top 3 is a hollow or tubular vertical standard 5, which extends with its lower end into the cabinet 1 and also extends a suitable distance above the cabinet, as appears in Figure 1. This standard carries the horizontally swinging arms for the larger instruments as well as the test chart, and is made vertically adjustable with respect to the base cabinet. To guide the standard in its vertical move-

ment, bosses are cast on the adjacent wall of the cabinet 1, the standard passing through guide holes in these bosses. An upper boss 6 for this purpose is disposed near the top of the cabinet, the inner face of the plate 3 being provided with a boss 3^a (Fig. 3) corresponding in shape to that of the boss 6 and positioned to rest upon it when the top plate 3 is in place. To prevent rotation of the standard 5, a set screw 7 in the boss 6 extends into a longitudinal groove 8 in the standard 5.

Below the boss 6, the same wall of the cabinet 1 has two spaced bosses 9 and 10 (see Figs. 3 and 5), which serve as lower bearings for the standard 5. Between the bosses 9 and 10 bears a worm wheel 11, which serves to feed the standard 5 up and down. For this purpose, the standard is longitudinally threaded for a portion of its length and the worm wheel 11 is internally threaded and is disposed upon the threaded portion of the standard. To rotate the worm wheel 11, a worm 12 is provided in engagement with the worm wheel, which worm is on a longitudinally manually operable shaft 13, which bears at its ends in suitable bearings provided for it in the adjacent wall of the cabinet 1. On the end of the shaft 13 outside of the cabinet is a hand wheel 14 and it is evident that by the rotation of this hand wheel the elevation of the standard is adjusted through the parts just described.

A swinging arm 15 for supporting an ophthalmometer 16 or other diagnostic instrument is carried by the standard 5 through the medium of a suitable bracket arm 17. This bracket which may be a casting, has at its inner end a hub 18 which is secured upon the standard 5 above the boss 9 by set screws, as shown. This bracket has two right angle bends or elbows, whereby its end which extends outside of the cabinet is offset to near the opposite side of the cabinet from the standard 5. The first leg of the bracket extends from the hub parallel to the shaft 13 to the vicinity of the wall of the cabinet adjacent the hand wheel 14, whence it extends parallel to that wall to near the opposite corner of the cabinet, and then again turns at right angles parallel to the first leg and extends out through the wall of the cabinet, an elongated opening 19 being provided in the wall of the cabinet for this purpose and to allow for the vertical adjustment of the bracket.

The extension of the bracket 17 outside of the cabinet divides to form a forked bracket 20, the arms of which are disposed in vertical alignment and serve as bearings for a vertical screw 21, which is screw threaded for a portion of its length at its upper end and for the rest of its length is smooth. The arm 15 has a hub portion 22 which surrounds the smooth portion of the screw 21 so as to pivot freely thereon, resting upon a thrust

collar 23 on the screw 21. A hand wheel 24 is provided with internal screw threads and engages over the upper end of the screw 21. It is evident that the weight of the arm 15 and of the parts carried thereby is taken by the wheel 24 where it bears on top of the upper arm of the forked bearing 20, a thrust bearing being interposed between the wheel and arm, as shown. As the hand wheel 24 is turned the screw 21 and the arm 15 are raised and lowered. On the outer end of the arm 15, is a support 25 for the ophthalmometer 16. The arm 15 is curved upwardly from its hub 22 so as to bring the ophthalmometer at substantially the proper height for the examination of the eyes of the patient sitting in the chair 26. This height may, of course, be varied both by the manipulation of the hand wheel 14 and of the hand wheel 24.

Supported on the standard 5 near its upper end is a hollow swinging arm 27 for supporting another instrument, such as the refractor 28. This arm is shown as carried by a sleeve 29 which surrounds the standard and bears against a thrust collar 30 on the standard. A knob 31 on the arm 27 is on the end of a taper screw 31^a threaded into the arm 27 and operating a push rod 31^b within the arm 27, which rod bears against the standard 5 and locks the arm 27 against rotation when the taper screw is set up, as shown in Fig. 1^a.

The refractor 28 is supported on the outer end of the arm 27 in such a manner as to be adjustable relative to the arm in both a vertical and horizontal direction. The vertical adjustment is effected through the mechanism illustrated in detail in Figure 2.

On the outer end of the arm 27 is a T-casting 32, the vertical head of which is tubular and serves as a bearing for the vertical screw 33 on the lower end of which is carried the holder for the refractor 28 and the horizontally adjusting mechanism. Surrounding the screw 33 within the casting 32 is a sleeve 34, which is splined to the screw 33 by a key 35. The sleeve 34 is free to rotate within the casting 32 unless restrained by a clamp hereinafter described, but it is held against longitudinal movement in the casting by a set screw 36, the end of which engages in a circumferential groove near the upper end of the sleeve. A hand wheel 37 has an internally screw threaded hub which engages over the screw 33 immediately below the sleeve 34, the wheel being retained in place by a two-part retaining ring 38 which engages in a circumferential groove in the hub of the hand wheel just below the lower end of the casting 32, the retaining ring being secured, as by screws, to the lower face of the casting. A clamp screw 39 passes through ears on the casting at its top end and screws into one of them

and serves when turned up to pinch the ears together and thus reduce the diameter of the upper end of the casting 32 which is slotted between the ears for a sufficient distance to permit of this distortion. A handle 40 is provided to operate the screw. The downward rotation of the handle 40 turns the screw to constrict the top of the casting and cause it to grip the sleeve 34 and hold it, and hence the screw 33, against rotation. It is evident that as the hand wheel 37 is rotated the screw 33 will be raised or lowered provided the sleeve 34 is locked against rotation by the clamp screw 39. When the sleeve 34 is released for rotation, it is evident that the screw 33 may be freely turned upon its own axis, which movement will cause the sleeve 34 and the hand wheel 37 to rotate therewith. Hence, the vertical position of the refractor will not be changed by the rotation of the screw 33, and it is evident that the screw 33 cannot be turned when the clamp handle 40 is depressed.

The lower end of the screw 33 is fixed in a T-casting 41, and a horizontal rod 42, which has on its end an attachment 43 for the refractor 28, is horizontally adjusted in the head of the T-casting 41 by turning a hand wheel 44, which adjustment is effected through any suitable mechanism, such as by a pinion on the shaft of the hand wheel which engages in rack teeth on the rod 42, as indicated by the dotted lines in Figure 1, or a construction for this purpose may be employed like that shown in the said patent to Hans Clement, No. 1,494,666. A test chart 46^b of suitable construction is supported on the standard 5, resting upon a thrust collar 46^c on the standard. The height of the test chart is such that its medial horizontal line is in the plane of the line of vision of the refractor when the refractor is adjusted to the proper height for the average patient seated in the chair 26. The test chart is contained in a cabinet which is so mounted as to be rotatable about the standard 5, whereby the face of the chart can be brought to the proper plane for the patient using the refractor to see the reflection of the chart in a mirror in front of the patient.

In using the instruments above described, the refractionist seats his patient in the chair 26 and then turns the hand wheel 14 until the refractor and the ophthalmometer are substantially at the correct height for the convenient use of the patient. If the refractor is the instrument first used, the arm 27 is swung around so as to bring the refractor before the eyes of the patient. If a further slight adjustment is needed either in a horizontal or vertical direction, such adjustment is effected either by turning the hand wheel 44 or the hand wheel 37, as above described. After the examination with the

refractor is completed, the handle 40 is raised and the refractor is swung around on the axis of the screw 33 to a position at right angles to that shown in Figure 1, when the arm 27 is swung back so as to move the refractor out of the way. Then the arm 15 is swung around so as to bring the ophthalmometer 16 before the patient. If its height is not exactly right, a further slight adjustment can be effected by turning the hand wheel 24. The support 25 is so mounted upon the arm 15 that it can be rotated upon its vertical axis, thereby enabling the refractionist to bring the lens system in line with either eye of the patient.

Current for illuminating the lamps in the ophthalmometer 16 and the test chart 46^b is brought into the base cabinet 1 where a suitable current controller is disposed from whence it is led to the respective lamps. In the construction shown, the electrical attachment to an outside source of current, such as a lamp socket or a wall receptacle, may be made at either one of two places. The standard 5 is shown as hollow and a receptacle 45 is provided in the top end of the standard, which receptacle is connected to the current controlling mechanism through wires 46 and 47, which pass down through the hollow standard and thence out through a hole in the standard provided for that purpose. Alternatively connection to the outside source of current may be made through a receptacle 48 in one wall of the cabinet 1 near the bottom thereof, which receptacle is connected to the current controlling mechanism through wires 46^a and 47^a. In Figure 1 a cable 49 from an outside source of current is shown as plugged into the receptacle 45.

The current controlling mechanism referred to also permits of the illumination of small diagnostic instruments from the regular city current which is employed to illuminate the ophthalmometer and the test chart. This current controlling mechanism is entirely contained within the cabinet 1 and is arranged to be conveniently operated from the exterior of the cabinet. This current controlling mechanism and its connections for the distribution of the current therefrom to the several points of utilization will now be described.

The current controlling devices are all contained upon the inner face of the panel 2, and the low voltage attachments for the small instruments are all supported upon the top angle extension 4 of the panel 2. The wires 46 and 47 (see Fig. 9) are connected to a fuse block 50 on the inner face of the panel 2, the other terminals of which block are connected to two conductors 51 and 52 on a plate 53 secured to the inner face of the panel 2. This plate 53 carries a manual switch 54, shown as of the push

button snap type, also a pilot light 55 and a receptacle 56. The switch 54 is shown as in the line of the wire 51, and the pilot light 55 and the receptacle 56 are connected in parallel across the wires 51 and 52. The wires 51 and 52 are connected to two conductive strips 57 and 58, preferably of copper, through wires 59 and 60, respectively. The copper strips 57 and 58 are attached to the inner face of the panel 2. For illuminating the lamp of the test chart, wires 61 and 62 are attached at their inner ends to the copper strips 57 and 58 and are led into the hollow standard 5 through a hole provided for that purpose, and are again brought out of the standard through a hole just below the bottom of the test chart, entering the bottom of the test chart, as shown in Figure 1. For illuminating the lamp in the ophthalmometer 16, wires 63 and 64 are also attached to the copper strips 57 and 58 and are brought out through the bracket 17 and the base of the forked bearing 20 through holes provided for that purpose, to the inner face of the arm 15 against which they are secured and run along the inner face of the arm and are led through the support 25 into the base of the instrument.

It is evident that the voltage of the lamps in the ophthalmometer and in the test chart, as well as that delivered to the receptacle 56 will be the full voltage of the supply circuit. This receptacle 56 merely provides for the user a convenient attachment for a lamp or for an instrument or any other translating device requiring the full circuit voltage. For the smaller instruments, such as ophthalmoscopes, retinoscopes and transilluminators, the lamps of which take a relatively small voltage, means are provided for the necessary reduction of the voltage and there are convenient supports in the cabinets for such instruments. In this way there is brought into one unit all of the instruments needed for examination purposes and a current supply to each instrument of the proper voltage. The low voltage electric circuits and the supports for the small instruments will now be described.

Carried by the top panel 4 are four jacks, three of which, numbered 65 may, for convenience, be referred to as the three-volt jacks and the fourth one, numbered 66, may be referred to as the six-volt jack. Against the face of the panel 2 behind these four jacks runs a conductor strip 67 and on the front face of the three jacks 65 is secured another conductor strip 68 shorter than the strip 67 so as to extend only across the three jacks 65. On the front face of the jack 66 is also secured a short conductor strip 69. The copper strip 58 is connected to the conductor 67 through the wire 70 and the strip 57 is connected to the conductor 68 through the wire 71, rheostat 72 and resist-

ance 73. The handle 74 for the rheostat 72 is on the external face of the panel 2. It is evident that the circuit is completed when the two conductors 67 and 68 are connected and this connection is controlled by the presence of an instrument in the respective jacks. By the adjustment of the rheostat 72 the voltage in this circuit may be regulated and is indicated by a volt meter 75 which is connected across the conductors 67 and 68.

The short conductor strip 69 on the front face of the six-volt jack 66 is connected to the strip 57 through wire 76 and resistance 77, which resistance is supported on the panel 2. The circuit for this jack 66 is also completed when there is a connection between the conductors 69 and 67, which connection is controlled by the presence of an instrument in the jack 66, as is the corresponding connection for the jacks 65. In parallel with the jack 66 is a six-volt receptacle 78 in the top panel 4. The receptacle 78 provides a convenient source of electric current at six volts for any purpose; and there is also provided an extra attachment for an instrument or any other translating device requiring three volts, the latter connection consisting of the binding posts 79 and 80 on the top panel 4. These binding posts are connected to the strips 57 and 58 in parallel with the conductors 67 and 68, this parallel connection for the binding posts being controlled by a manual switch 81 on the face of the panel 2.

To connect the conductors 67 and 68, the cables for the instruments for the several jacks are connected to binding posts on the jacks, one series of binding posts being on the conductor 68 and the other series of binding posts being on the same face of the jacks but having their connection to the conductor 67 automatically controlled as the instruments are inserted in and withdrawn from the respective jacks. This feature of construction is common to all of the jacks, including the jack 66 and the connection of its conductor 69 with the conductor 67.

On the conductor 68 is a binding post 82 for each jack, this series of binding posts including a binding post on the conductor 69. Below the binding post 82 on each jack is another binding post 83, which is connected to the conductor 67 on the inside face of the jacks through an automatic switch consisting of a movable spring contact strip 84 and a cooperative stationary contact strip 85. Spring contact strip 84 has its one end underneath the binding post 83 and is bent at right angles and runs along the side face of the jack and bears at its inner end against the contact strip 85, which is disposed between the rear face of the jack and the strip 67 in contact with the latter and extends along the side face of the jack for a sufficient distance to be engaged by the co-

operative contact member 84. The jack has in its side face a longitudinal groove or recess and the contact member 84 is shaped to engage the bottom of this recess or groove for the portion of its length which is over the groove. Each jack is provided with a vertical socket 86 for the reception of the lower end of an instrument 87 and the side groove in the jack is deep enough to intersect the socket 86 with the result that when the instrument is in the socket of the jack, it serves to open the automatic switch, as shown in the jack on the right in Figure 5.

As shown in Figure 8, the cable or cord 88 for the instrument 87 is sufficiently long to allow the instrument to be taken over to the examining position before a patient seated in the chair 26. One wire of this cable is connected to the binding post 82 and the other wire is connected to the binding post 83. The cable passes up through a hole in the bottom of the jack connecting with the socket 86 and thence is attached to the instrument, as shown in Figures 6 and 7. In order to cause the cable to be retracted into the cabinet after it has been pulled out and when the instrument is returned to its place in the jack a weighted pulley 89 is shown as placed on the cord.

It is now evident that as long as the several low voltage instruments remain in their respective jacks, the circuit for the lamps of the instruments is broken by reason of the open condition of the switch 84, 85, irrespective of the condition of the main switch 54. When the main switch is closed the switch 84, 85 automatically closes as the instrument is withdrawn, and when the refractionist is through with that instrument he reinserts it in its jack which serves again to automatically break its circuit, the cable meanwhile having been retracted by the weighted pulley 89.

Means are also provided to clamp the cable in any position to which the instrument is pulled out of the cabinet and thereby avoid the necessity of causing the refractionist to sustain the weight of the pulley 89 while he is making his examination with that particular instrument. As shown, this construction consists of a spring plunger 90 which is seated in a longitudinal bore in the jack and is normally pressed out by a spring with its stop shoulder against the panel 2 and with its reduced end protruding through a hole in the panel. This plunger 90 is provided with a transverse hole through which the cable 88 passes, and this hole is so disposed that it may be aligned with the axis of the socket 86 when the plunger is pressed inwardly against the tension of the spring, but is normally out of line with the axis of the socket. This serves as an effective clamp for the cable 88 while at the same time being adapted to yield and

permit the withdrawal of the cable when the refractionist pushes in the plunger 90 or exerts a sufficient pull on the cable in taking out the instrument 87. In order to facilitate the withdrawal of the cord as the instrument is pulled out, the refractionist may push the plunger in and hold it in until the cord is withdrawn the requisite length, and in order to obtain sufficiently secure clamping of the cable it may be found necessary to use a spring so strong that it will be necessary to release the cable by pressing in the plunger 90 before taking the instrument out of its jack. As soon as this pressure or pull ceases, the spring tension pushes the plunger outward to hold the cable in that position.

It will be observed that this apparatus brings into one convenient assembly all of the instruments to be used for making optical examinations, that all of the instruments or other devices requiring current are supplied from one source and that all of the wiring and electrical parts are concealed within the apparatus, although the operating parts therefor are conveniently accessible from the outside of the apparatus.

It is evident that various modifications may be made in the construction shown in the drawings and above particularly described within the principle and scope of our invention.

We claim:

1. An optical testing device comprising a base cabinet, a standard entering the top of the cabinet and vertically adjustable therein, a support for a diagnostic instrument carried by the standard externally of the cabinet, an electrical receptacle carried by the cabinet and accessible from the exterior thereof, current controlling devices within the cabinet connected to the said receptacle, and leads from said devices to the said support.

2. An optical testing device comprising a base cabinet, a hollow standard entering the top of the cabinet and vertically adjustable therein, a support for an instrument carried by the standard externally of the cabinet, lead-in electrical wires entering through the hollow standard, current controlling devices within the cabinet connected to the lead-in wires, means for conducting current from the current controlling devices to said support, and means on the exterior of the cabinet for operating the current controlling devices.

3. An optical testing device comprising a cabinet, an arm mounted to swing on a vertical axis carried by said cabinet, a support on said arm for a diagnostic instrument, an external attachment for a diagnostic instrument on the cabinet, an electrical receptacle carried by the cabinet and accessible from the exterior thereof, current con-

trolling devices within the cabinet connected to the said receptacle and to both the said support and attachment for diagnostic instruments, and means on the exterior of the cabinet for operating the current controlling devices.

4. An optical testing device comprising a base cabinet, a vertical standard carried by the cabinet, two arms carried by the standard and mounted thereon to swing in different horizontal planes, a support on each arm for a diagnostic instrument, current controlling devices within the cabinet, means external of the cabinet for operating the current controlling devices, and means for connecting the current controlling devices to an external source of electric current and to one of the said supports for diagnostic instruments.

5. An optical testing device comprising a base cabinet, a vertical standard carried by the cabinet, two arms carried by the standard and mounted thereon to swing in different horizontal planes, one of the arms being vertically adjustable relative to the standard, means for vertically adjusting the standard relative to the cabinet, a support on each arm for a diagnostic instrument, current controlling devices within the cabinet, means external of the cabinet for operating the current controlling devices, and means for connecting the current controlling devices to an external source of electric current and to one of the said supports for diagnostic instruments.

6. An optical testing device comprising a base cabinet, a hollow vertical standard entering the top of the cabinet and vertically adjustable therein, a horizontally swinging arm carried by the standard having a support thereon for a diagnostic instrument, current controlling devices within the cabinet and operable from the exterior thereof, lead-in wires for electric current entering through the hollow standard and connected to the current controlling devices, and means electrically connecting the said devices with the said support for diagnostic instruments.

7. An optical testing device comprising a base cabinet, a hollow vertical standard entering the top of the cabinet and vertically adjustable therein, a horizontally swinging arm carried by the standard having a support thereon for a diagnostic instrument, an external attachment for a diagnostic instrument on the cabinet, current controlling devices within the cabinet and operable from the exterior thereof, lead-in wires for electric current entering through the hollow standard and connected to the current controlling devices, and means for connecting the said devices both with the said support and attachment for diagnostic instruments.

8. An optical testing device comprising a cabinet, current controlling devices within

the cabinet operable from the exterior thereof, means for connecting said devices to an external source of electric current, a jack in the wall of the cabinet for a diagnostic instrument, two electric conductors connected to the current controlling devices, and a switch for connecting the two conductors controlled by an instrument in the jack.

9. An optical testing device comprising a cabinet, current controlling devices within the cabinet operable from the exterior thereof, means for connecting said devices to an external source of electric current, two electric conductors connected to the current controlling devices, a jack for a diagnostic instrument in the wall of the cabinet disposed adjacent the said conductors, two binding posts for the instrument leads, one post being permanently connected to one of the said conductors, and a movable contact member controlling the connection of the other post to the other conductor and biased to closed position and arranged to be opened by an instrument in the jack.

10. An optical testing device comprising a cabinet, a jack for a diagnostic instrument in one wall of the cabinet, two electric terminals adjacent the jack adapted to be connected to a source of current, means for attaching instrument leads to said terminals, and a switch device in said jack biased to closed position and arranged to be opened by an instrument in the jack.

11. An optical testing device comprising a cabinet, a jack for a diagnostic instrument in one wall of the cabinet, two electric terminals adjacent the jack adapted to be connected to a source of current, leads of substantial length connected at one end to said terminals and extending with their other ends through said jack for attachment to an instrument externally of the cabinet, a slidable weight on said leads within the cabinet, and a switch device in said jack biased to closed position and arranged to be opened by an instrument in the jack.

12. An optical testing device comprising a cabinet, a jack for a diagnostic instrument in one wall of the cabinet, two electric terminals adjacent the jack adapted to be connected to a source of current, leads of substantial length connected at one end to said terminals and extending with their other ends through said jack for attachment to an instrument externally of the cabinet, a slidable weight on said leads within the cabinet, a clamp for the leads biased to lock the leads in any position and releasable from the exterior of the cabinet, and a switch device in said jack biased to closed position and arranged to be opened by an instrument in the jack.

In witness whereof, we hereunto subscribe our signatures.

HANS CLEMENT.
GILBERT S. DEY.