Aug. 2, 1966 B. G. RUSSELL, SR 3,263,627

MOTORIZED INSTRUMENT SUPPORTING CARRIAGE AND TRACK

Filed Dec. 2, 1964 3 Sheets-Sheet 1

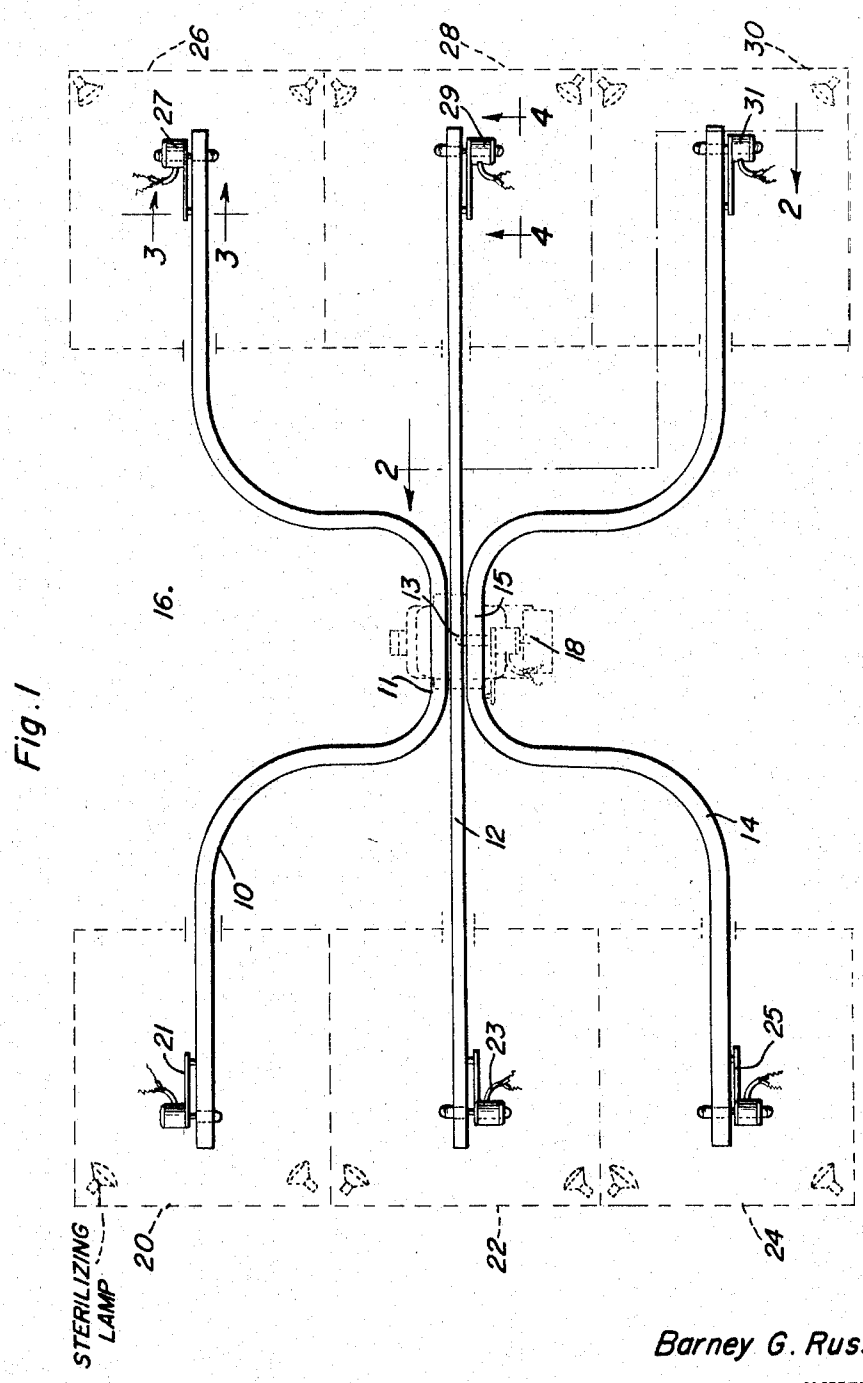


Fig. 1

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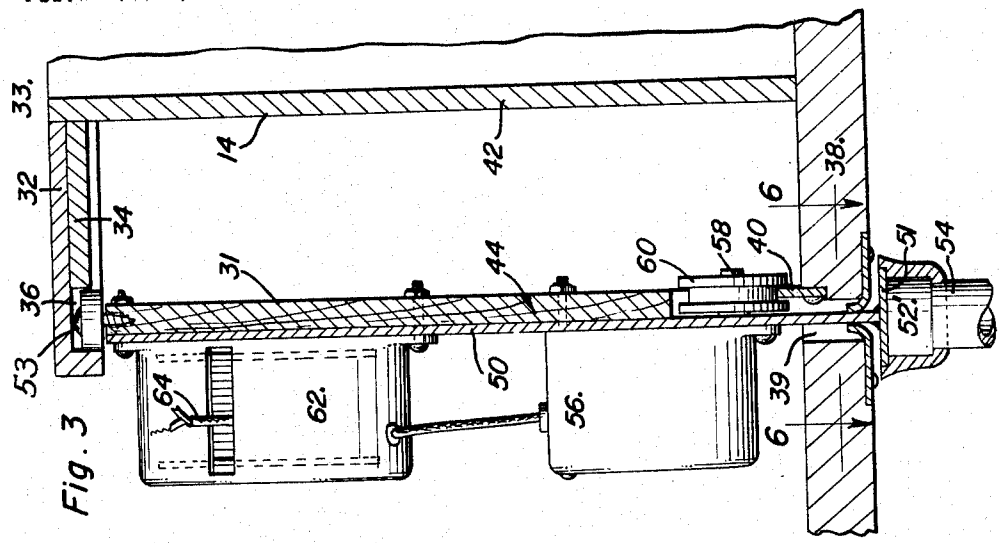


Fig. 3

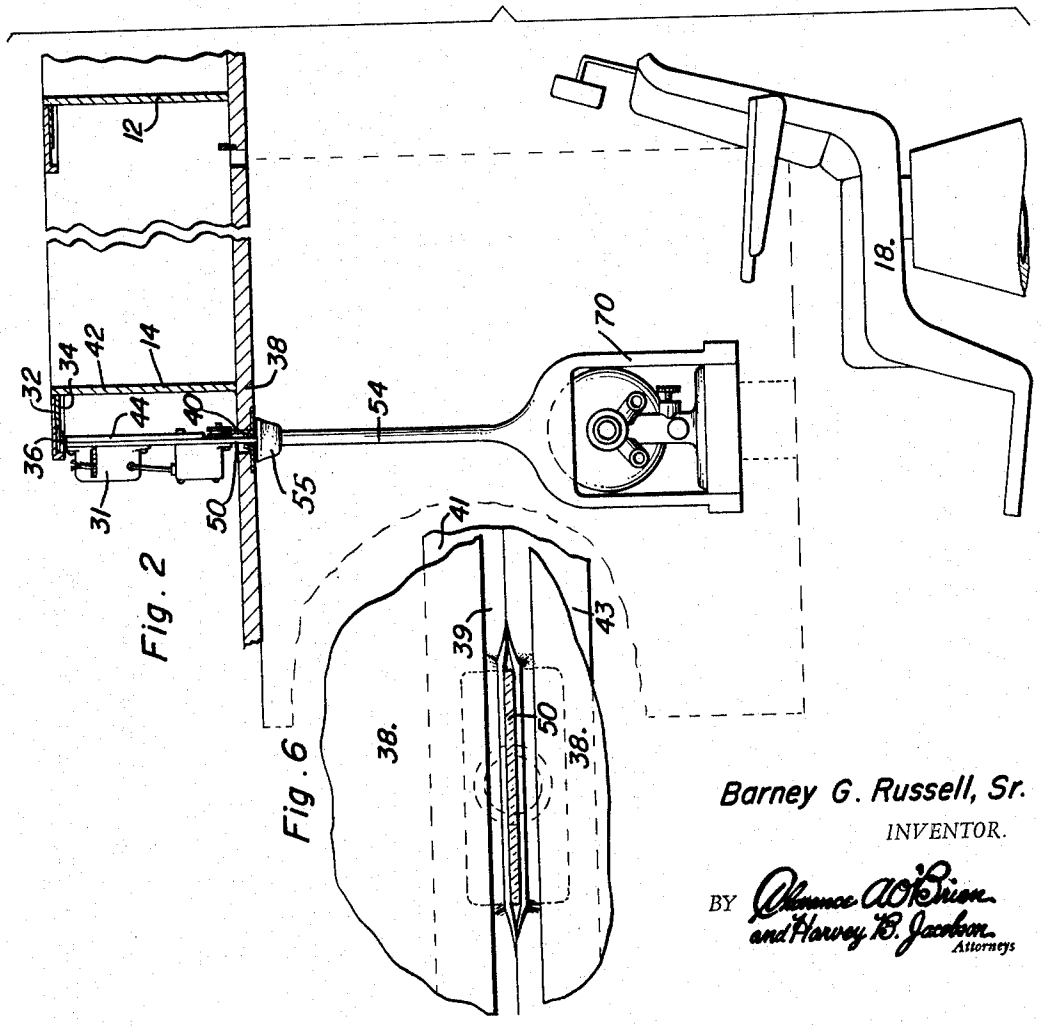


Fig. 2

Fig. 6

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MOTORIZED INSTRUMENT SUPPORTING CARRIAGE AND TRACK

Filed Dec. 2, 1964 3 Sheets-Sheet 3

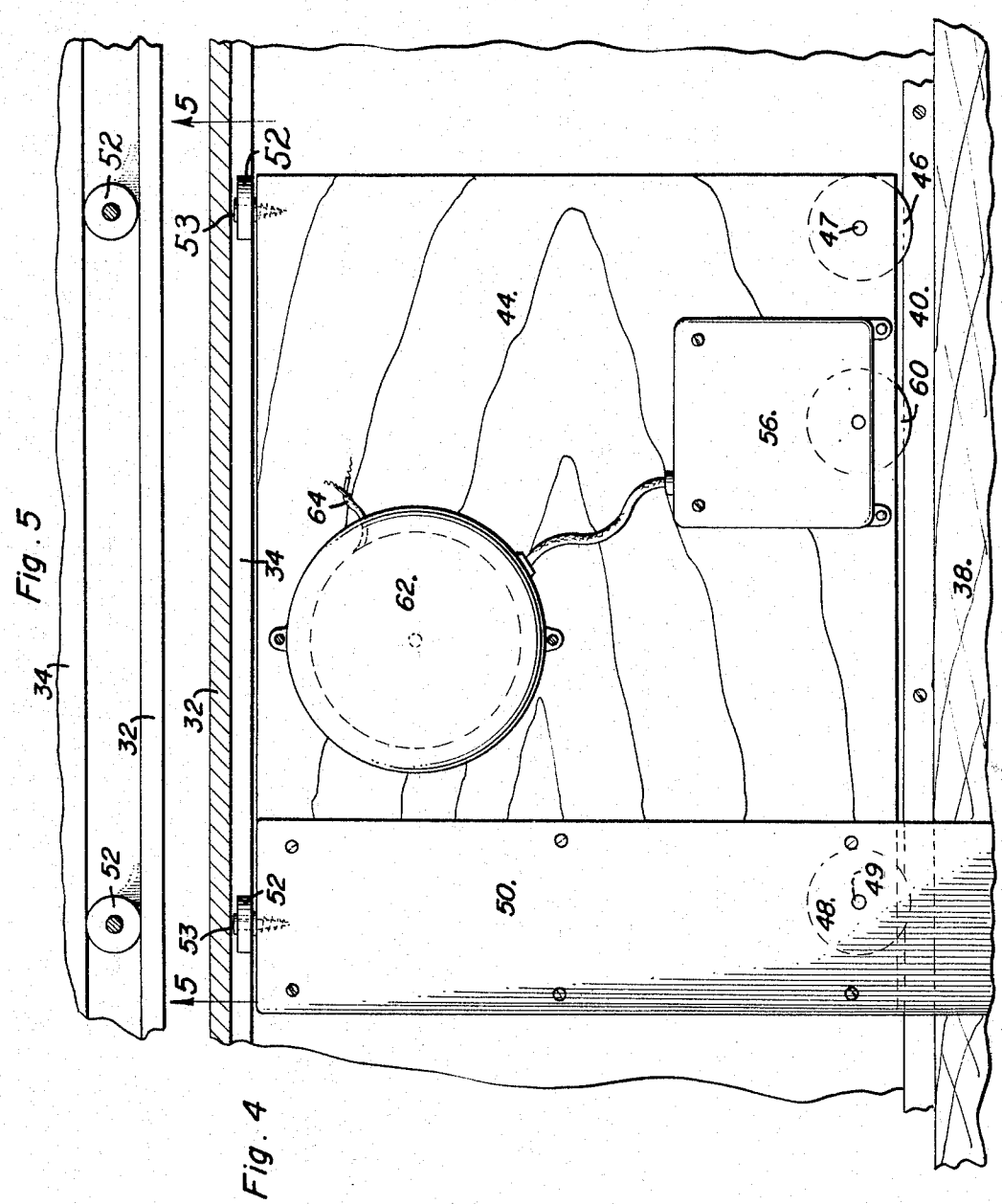


Fig. 5

Fig. 4

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MOTORIZED INSTRUMENT SUPPORTING CARRIAGE AND TRACK

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5 Claims. (Cl. 105—147)

This invention relates generally to a means for supporting instruments and particularly to means for suspending instruments by providing a motorized instrument supporting carriage and track which is integral with a building structure.

In the practice of ophthalmology and optometry, for example, it is necessary to utilize a number of diagnostic or visual aid instruments in the course of the routine examination or treatment of a patient. Many of the instruments utilized are by nature of their complexity rather cumbersome and heavy and therefore require support structures to properly orient them with regard to the patient during the course of examination or treatment. In the past the instruments were therefore generally supported by a pedestal-type support which was adjacent the patient's examining chair. Due to size and weight of the instruments, it was generally unpractical to attempt to support more than two instruments from a single pedestal, accordingly this required that the practitioner utilize more than one chair (instrument-support-pedestal) unit in order to have all the required instruments available.

This duplication becomes costly and also tends to detract from the efficient utilization of the examining room space and also necessitates that the patient be moved from chair to chair as it becomes necessary to utilize numerous instruments during the course of an examination or treatment. This, of course, results in an inconvenience and loss of valuable time to both the patient and the practitioner.

Accordingly, it is an object of this invention to provide means for supporting instruments in such a manner so as to provide a more efficient utilization of the room within which they are utilized.

It is another object of this invention to provide a means of supporting instruments in suspended relationship so that the space beneath may be utilized more efficiently.

Still another object of this invention is to provide a means of individually supporting a plurality of instruments in non-use or storage position and means for efficiently conveying the instruments from the storage position to a second "use" position and subsequently returning the instruments to the storage position.

Still another object of this invention is to provide a motorized instrument supporting carriage and track which may be substantially enclosed within the ceiling, or false ceiling of a room, thus providing an aesthetically pleasing installation which does not disturb the patient.

The instant invention provides a highly practical and efficient means of supporting a plurality of instruments from individual stabilized carriages which are horizontally movable along a rail system secured adjacent the ceiling of a laboratory, examination or treatment room or the like.

The instant invention further provides a means of individually supporting the instruments required and efficiently transporting them individually, as required, from a storage position to a substantially common position adjacent a patient's chair, for example.

Although the instant invention is described and illustrated in connection with ophthalmological and optometrical examining and treatment rooms, it is understood that the instant invention is suitable for wide variety of applications such as laboratories, operating rooms, clinics, dental offices, to name a few.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a top plan view of a motorized instrument supporting carriage and track in suspended relationship to an examining chair;

FIGURE 2 is an enlarged elevational view of the motorized carriage taken along the line **2—2** of FIGURE 1 and further showing a partial vertical sectional view of the supporting track;

FIGURE 3 is an enlarged elevational view of the supporting carriage and track showing a partial vertical section of the motorized support carriage and track taken along the line **3—3** of FIGURE 1;

FIGURE 4 is an enlarged elevational view of the motorized support carriage taken along the line **4—4** of FIGURE 1;

FIGURE 5 is a bottom plan view of the carriage stabilizing track and rollers taken along the line **5—5** of FIGURE 4; and

FIGURE 6 is a slightly enlarged partial top plan view of the track sealing means taken along a line perpendicular to the line **6—6** of FIGURE 3.

Referring to the drawings in detail and particularly FIGURES 1 and 2, it is seen that a plurality of trackways indicated generally at **10**, **12** and **14** are secured adjacent the ceiling of an optometrical examining room **16**, for example. An examining chair **18** is positioned in the room **16** at any suitable point.

The trackways **10**, **12** and **14** converge over the chair **18** and are preferably provided with relatively straight portions **11**, **13** and **15** which are substantially parallel for reasons which will become clear.

The terminal portions of the trackways **10**, **12** and **14** preferably terminate within dust-free instrument storage enclosures schematically indicated by broken lines at **20**, **22**, **24**, **26**, **28** and **30**. Although not shown, the fronts of the storage enclosures may be equipped with remotely controlled closures which may be opened to permit passage of an instrument suspended from the trackways.

A plurality of substantially identical motorized instrument supporting carriages indicated generally at **21**, **23**, **25**, **27**, **29** and **31**, are shown on their respective trackways **10**, **12** and **14**. As seen best in FIGURE 1, the motorized instrument supporting carriages **21**, **23**, **25**, **27**, **29** and **31** are shown in position within their respective dust-free storage enclosures **20**, **22**, **24**, **26**, **28** and **30**.

Although the structure of the trackway and the instrument supporting carriage is described with regard to one specific trackway and one specific instrument supporting carriage, it is understood that all the trackways and all the instrument supporting carriages are substantially identical.

In FIGURES 2 and 3 it is seen that the trackway indicated generally at **14** includes an upper stabilizing guide means for a supporting carriage the guide means being

formed by an "L"-shaped member **32** of suitable material such as aluminum, or wood, for example, and secured to the ceiling **33** by means of nails or screws. A second member **34** also of aluminum or wood, for example, is secured by nails or screws to member **32** as shown in FIGURES 2 and 3. The members **32** and **34** therefore define a downwardly open slot **36**. The members **32** and **34** are understood to extend along substantially the entire length of the underside of the upper portion of the trackway **14**.

The false ceiling **38** which carries the rail **40** is supported by a rigid hanger **42** of wood, for example, which is secured to the upper stabilizing means and the ceiling **33** by suitable means such as nails, screws, or bolts. The hanger **42** also extends along substantially the entire length of the trackway **14**.

The rail **40** is preferably formed of aluminum and is secured by means of screws with the lower portion secured in a rabbet formed in a slot in the false ceiling **38** as seen best in FIGURE 3.

The motorized instrument supporting carriage includes a carrier **44** formed of wood, for example, which is supported on the trackway **40** by a pair of flanged tracking rollers **46** and **48** which are preferably formed of a plastic material such as nylon, or Teflon, for example. The tracking rollers **46** and **48** are rotatably secured to the carrier **44** by means of bolts **47** and **49** as best seen in FIGURE 4. The upper portion of the carrier **44** is stabilized by a pair of stabilizing rollers **52** which are rotatably secured to the carrier **44** by means of screws **53**.

The stabilizing rollers **52** are capable of rolling within the upper guideway **36** without any undue horizontal movement transverse to the guideway **36** thereby assuring the stability of the carriage **31** as it moves along the track **40**.

A rigid supporting member **50** formed of steel or aluminum, for example, is secured by means of bolts or screws to the carrier **44** as seen best in FIGURE 4. The lower end of member **50** projects downwardly through a slot **39** cut in the ceiling **38**. A horizontal portion **51** is secured to the lower end of the member **50** by suitable means such as welding, for example.

A suitable coupling union indicated generally at **52'** is secured to the horizontal portion **51** of the member **50** and provides a means of securing an instrument carrying arm **54**. A resilient boot **55** is placed over the union **52'** for aesthetic reasons. The arm **54** may be adapted to carry any type of instrument, etc., desired. Although the carrier **44** may be moved along the trackway **14** by manual means or means such as a cord and pulley arrangement, such as used with traversing drapery operators, it is preferable to provide each instrument carrier with a power operating means. As seen best in FIGURES 3 and 4, the carrier **44** is provided with a gear reduction reversible electric motor **56** with an output shaft **58**. A flanged drive roller **60** is secured to the shaft **58** by means of a set screw (not shown) which cooperates with a flat surface on the shaft **58** to lock the roller **60** so that the drive roller **60** rotates in unison with the shaft **58**. The drive motor **56** is secured to the member **44** by bolts and is supplied with electrical power through an electrical cord reel indicated generally at **62** and secured to the carrier **44** by bolts.

The electrical cord **64** is connected to a suitable source of current through a suitable controller of conventional design (not shown) in a manner which will be described later.

To insure sufficient frictional engagement of the drive roller **60** with the rail **40** a spring (not shown) may be secured to the screws **53** or to the top of the carrier **44** between the rollers **52** and the member **32** to bias the carrier downwardly against the rail **40**.

As seen best in FIGURES 3 and 6 the slot **39** in the ceiling **38** is preferably sealed by a pair of resilient seals

41 and **43**. As seen in FIGURE 6, as the carriage **31** traverses the track **40** the depending support member **50** parts the seal members **41** and **43** and after it passes a given point, the seal members **41** and **43** assume their normal position thereby effectively sealing out the dust and the like from the trackway.

When required the instrument **70**, supported by the motorized carriage **31**, for example, may be brought from the "storage" position in the dust-free enclosure in FIGURE 1, to the "use" position adjacent the patient's chair shown in broken lines in FIGURE 1 by manipulating a suitable electrical controller preferably adjacent the patient's chair (not shown), which supplies current to the motor **56**, thus causing the drive roller **60** to rotate and consequently propel the carriage **31** along the track **40** from the "storage" position to a "use" position which in this case is adjacent the chair **18**. The room may be equipped with any number of trackways and in the installation illustrated, it is desirable to have the trackways over the chair in parallel relationship so that as the instruments on the several trackways are individually brought to the "use" position, they will be in substantially the same position with respect to the chair. When the operator is finished with a particular instrument, it is merely necessary to manipulate the controls and reverse the motor **56** to transport the instrument from the "use" position back to the "storage" position.

Accordingly, it may be seen that the instant invention provides an efficient means of supporting instruments or the like without unduly cluttering up the examining room. Since it is not necessary to move the patient around during the course of examination or treatment, considerable time is saved. Generally speaking the speed of the drive motor on the carriage is designed to transport the carriage to or from the storage position in approximately ten seconds.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. In combination with a ceiling of a room, an instrument supporting apparatus substantially enclosed within a false ceiling depending from the ceiling of the room for supporting and transporting an optometrical instrument and the like from a generally dust-free storage position to a use position adjacent an examining chair which comprises a trackway integral with the ceiling, said trackway including an upper stabilizing track secured to the ceiling, said false ceiling being spaced downwardly from and supported by said ceiling, a lower track supported from said upper stabilizing track and integral with said false ceiling, a carriage supported by and movable along said lower track, said carriage including a carrier supported on said track by at least a pair of tracking rollers carried by said carrier, at least a pair of upper stabilizing rollers carried by said carrier and operatively engaged by said upper stabilizing track to stabilize said carrier, a motor carried by said carrier, a drive roller in driving relationship with said lower track carried by said motor to propel said carrier along said trackway, said false ceiling being provided with a slot adjacent and parallel to said lower track, a supporting member carried by said carrier and projecting downwardly therefrom through said slot in said false ceiling to provide a means of supporting an instrument adjacent an examining chair in suspended relationship to the floor of the room and resilient seal members supported by said false ceiling adjacent the slot for effectively sealing the slot in the false ceiling but allowing passage of said depending supporting member as said carriage moves along said trackway.

2. The combination of claim 1 wherein said motor is a gear reduction reversible electric motor.

3. The combination of claim 1 wherein said resilient seal members are substantially flush with the lower side of said false ceiling.

4. In combination with a ceiling of a room, an instrument supporting apparatus substantially enclosed within a false ceiling depending from the ceiling for supporting and transporting an optometrical instrument and the like from a generally dust-free storage position to a use position adjacent an examination chair which comprises an overhead suspension means, said overhead suspension means being supported by and integral with the ceiling of the room, said suspension means including a track system, an instrument support means movably carried by said track system for movement along said track system between the instrument storage position and the instrument use position and stabilizing means carried by said instrument support means and coacting with the track system to stabilize said instrument support means to prevent undue transverse or vertical movement of said instrument support means.

5. The combination of claim 4 wherein the instrument support means is provided with a power means to propel said support means along said track system.

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