

Oct. 16, 1956

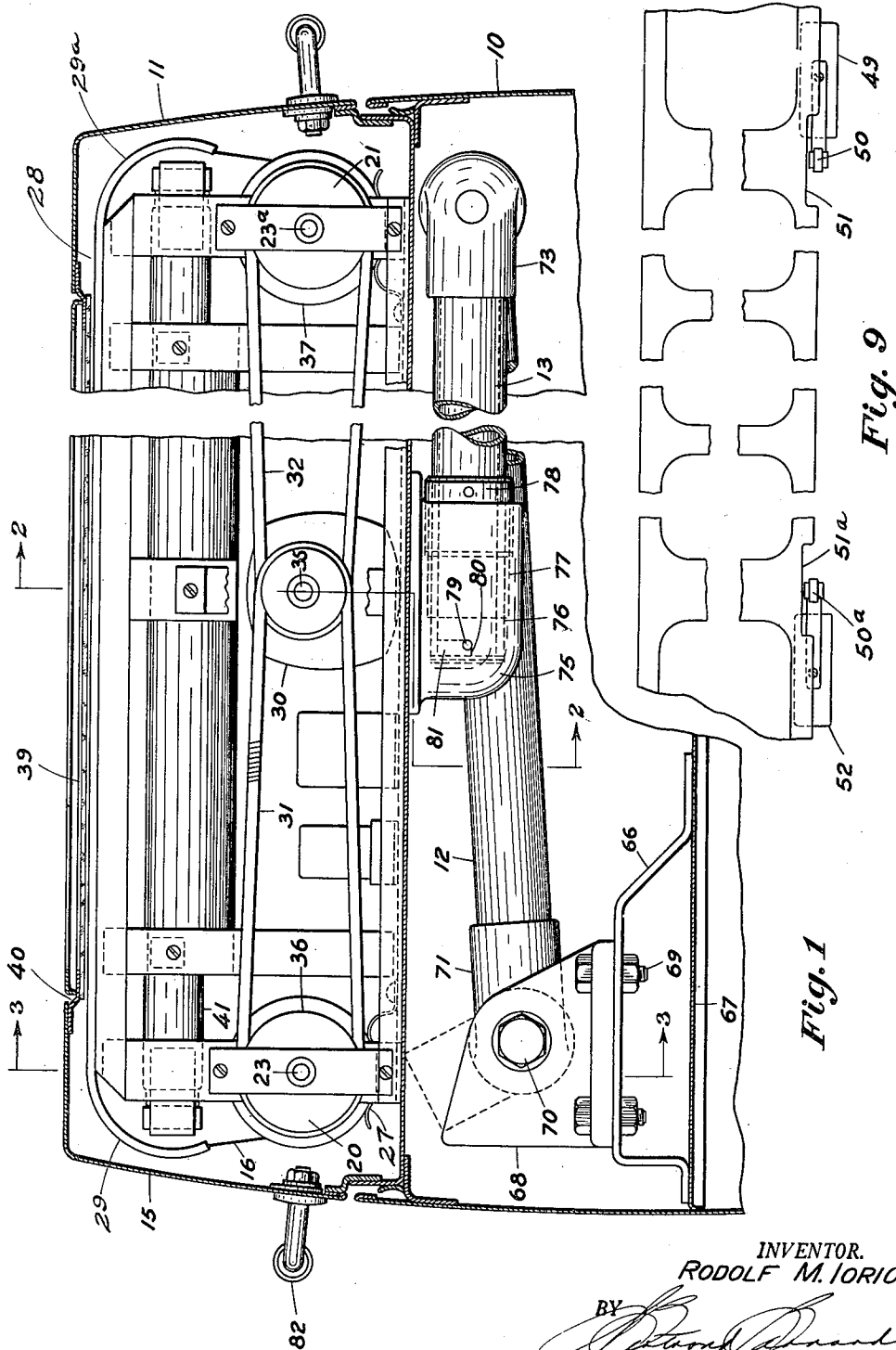
R. M. IORIO

2,766,538

COMBINATION DENTAL X-RAY PROJECTOR AND CABINET

Filed Oct. 25, 1951

4 Sheets-Sheet 1



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COMBINATION DENTAL X-RAY PROJECTOR AND CABINET

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4 Sheets-Sheet 2

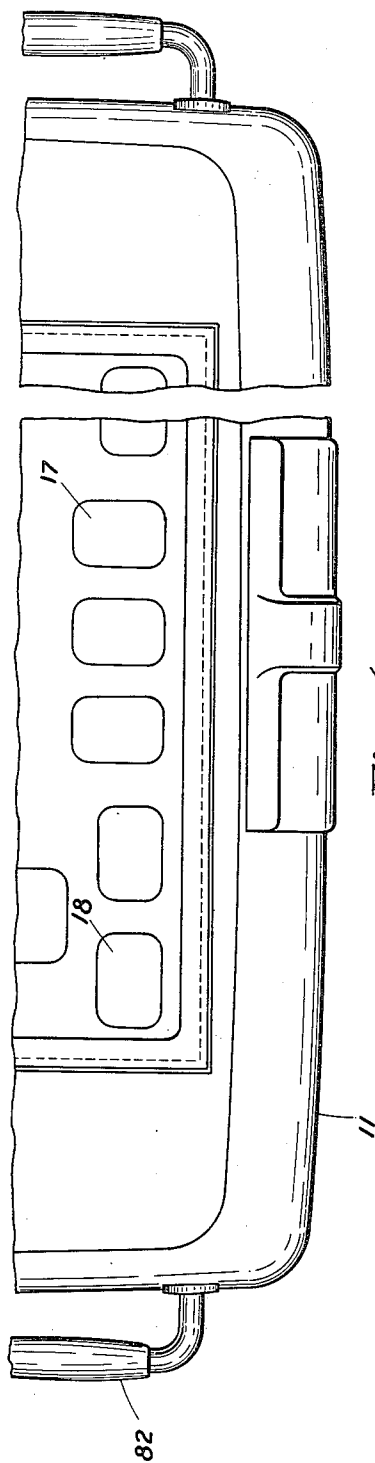


Fig. 4

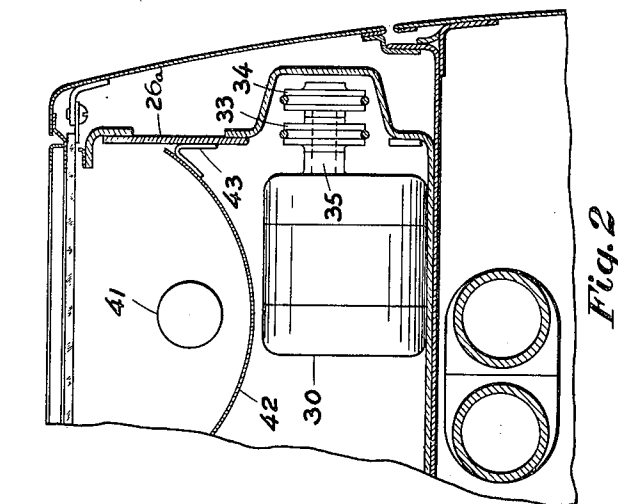


Fig. 2

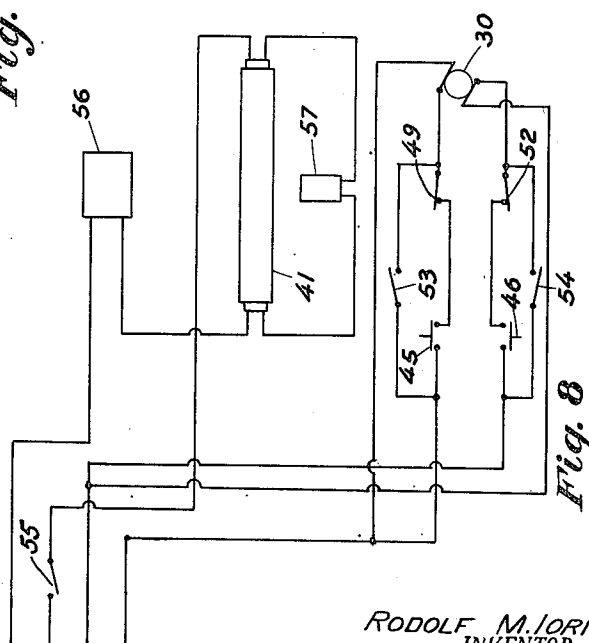


Fig. 8

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4 Sheets-Sheet 3

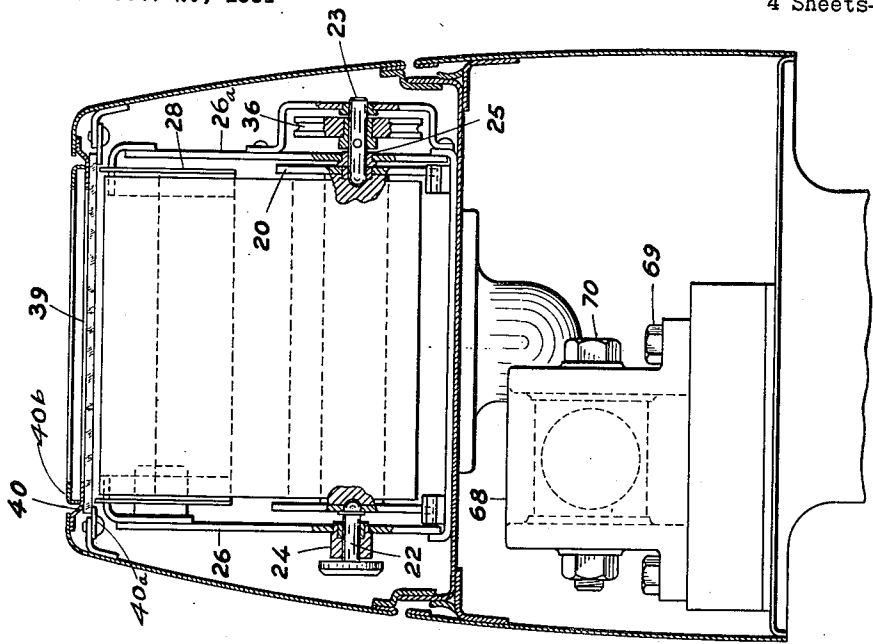


Fig. 3

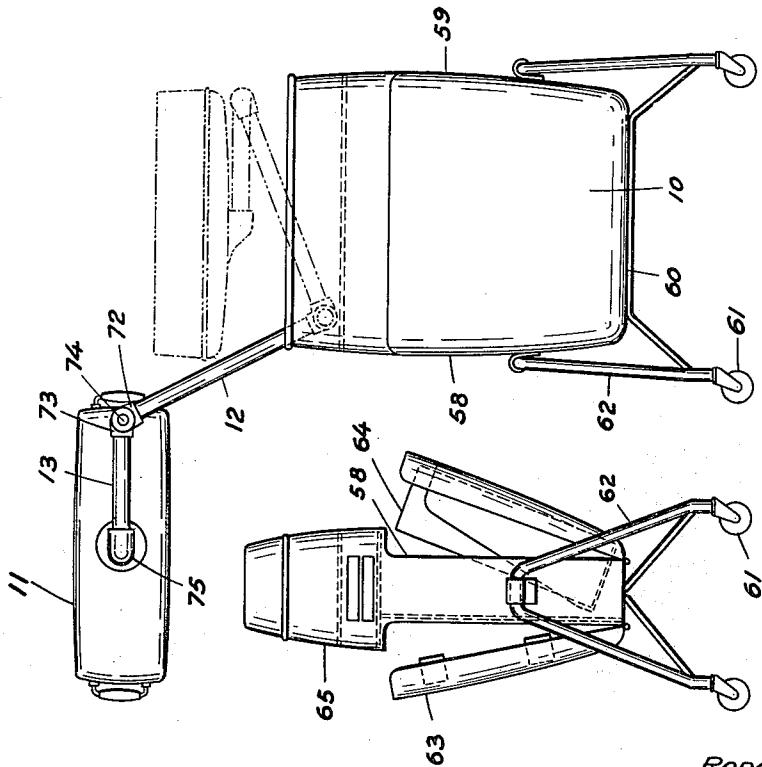


Fig. 5

Fig. 6

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4 Sheets-Sheet 4

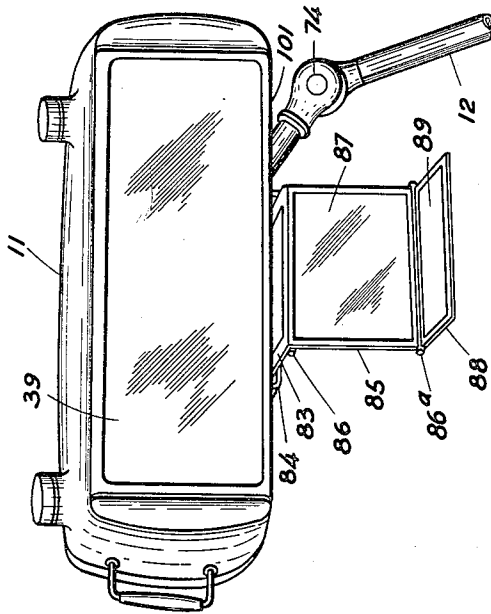


Fig. 7

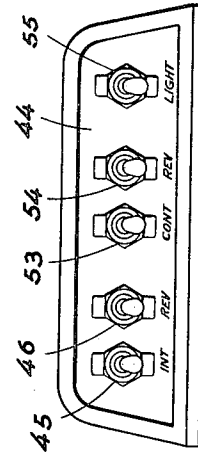


Fig. 10

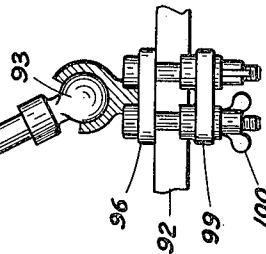


Fig. 11

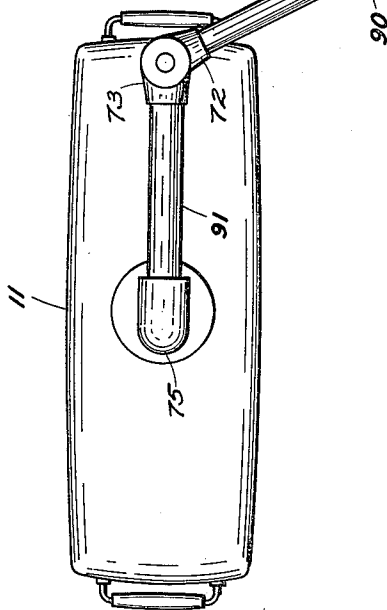
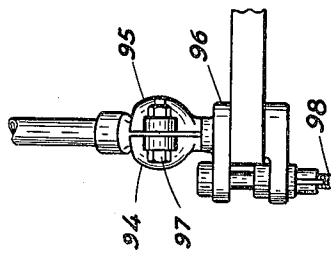


Fig. 12



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2,766,538

COMBINATION DENTAL X-RAY PROJECTOR AND CABINET

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Application October 25, 1951, Serial No. 253,080

12 Claims. (Cl. 40—31)

This invention relates to dental X-ray film projectors, and is particularly directed to a projector on which a series of X-ray photographs mounted on a continuous film, may be selectively and progressively projected and illuminated so that they can be observed by a patient.

It is particularly directed to a combination cabinet and projection unit which will enable a patient to simultaneously observe a projection of a set of X-ray photographs of his own teeth and compare them with a set of X-ray photographs of a corresponding set of teeth displayed on a continuous film while at the same time observing a reflection of his own teeth in a mirror.

The unit combines a cabinet for storing and filing X-ray films, which is fitted with a projection head, supported on the cabinet by a set of pivoted arms, in such a manner that when in use, the projection head may be moved to any convenient position or angle, relative to the cabinet, so that the projected film band may be readily observed by the patient simultaneously with his observation of a set of X-ray photographs of his own teeth and a mirror reflection of his teeth.

The projection head is so constructed and controlled as to enable an operator to selectively display a section of a continuous film band while it is moving in one direction, reverse the direction of the film, so as to selectively project another section thereof, or stop the film movement and project a section, or sections thereof, or individual X-ray photographs, or frames including sets of photographs of a patient's teeth, for a sustained period.

The unit is so constructed, that when out of use, the support arms of the projection head may be folded, so that the arms fit into the film storage cabinet, the projection head forming a top for the cabinet.

The object of my invention is to provide a projection unit for displaying X-ray photographs, mounted on a continuous film band, in such a manner that they may be illuminated and projected either continuously, or selectively in groups, under control of the operator.

A further object is to provide a projection head, which may be supported by a set of pivoted arms in such a manner that the head may be adjusted and retained in any convenient observation position when in use, and also retracted against the cabinet so that the projection head forms the top of the cabinet when not in use.

A further object is to provide a combination projection head, which will enable a person to simultaneously observe one set of X-ray photographs projected from a continuous film band, and another set of X-ray photographs supported in frames on an X-ray film card, and at the same time observe a reflection of his own teeth in a mirror.

A further object is to provide an X-ray projection unit, which will enable an operator to project the film band, while it is moved in either one direction, or the opposite direction, or while the film band is stationary, to enable the operator to select, at will, a portion of the photo-

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graphs on the film, which he wishes to display or stress at a particular time.

A primary object is to provide a combination cabinet and X-ray film projector which will combine in one compact unit, the functions of a film storage cabinet, a continuous X-ray film projector, and an individual X-ray film projector, the unit being so constructed that it can be operated, adjusted and controlled by a person of ordinary skill, without special tools or equipment.

The accompanying drawings, illustrative of one embodiment of my invention, and several modifications thereof, together with the description of their construction and the method of operation, control and utilization thereof, will serve to clarify further objects and advantages of my invention.

In the drawings:

Fig. 1 represents a vertical section through the projection head case, showing the driving mechanism for driving and supporting the continuous film band, and the support arms, which adjustably support the projection head on the cabinet.

Fig. 2 is a cross-section through the projection head case, taken at approximately the center thereof, at 2—2, Fig. 1, showing the motor and the pulleys used for driving the continuous film band selectively in opposite directions.

Fig. 3 is a cross-section through one end of the projection head case, taken at 3—3, Fig. 1, showing the rollers supporting the continuous film band, and the pulleys driving the film band support rollers.

Fig. 4 is a front elevation of the projection head, shown in Fig. 1, showing the location of individual X-ray photograph films on the continuous projection film band.

Fig. 5 is a rear elevation of a cabinet, with the projection head mounted thereon, the projection head being supported in the projection position by a set of pivoted arms.

Fig. 6 is a side elevation of the cabinet, shown in Fig. 5, with the side walls opened to show the X-ray film filing sections, and the projection head retracted so that it forms the top of the cabinet.

Fig. 7 is a modified front perspective view of the projection head, shown in Fig. 1, with a folding mirror, attached to the bottom of the projection head case, open and ready for operation.

Fig. 8 is a schematic wiring diagram of the projection head shown in Fig. 1, showing the electrical connections for the motor, the control switches, and the lighting control mechanism used in the projection head.

Fig. 9 is a front elevation of the film band, shown in Fig. 4, showing a pair of micro-switches, which engage a series of slots, formed in one edge of the film band, to shut off the flow of current to the motor in both directions.

Fig. 10 is a front elevation of the control panel and switches mounted on the projection head, shown in Figs. 1, 3 and 4.

Fig. 11 is a rear elevation of the projection head, shown in Fig. 1, with the head supported by a set of adjustable universal arms, a clamp being provided on one of the arms so that it can be clamped to a table or cabinet.

Fig. 12 is a side elevation of the lower support arm and clamp, of the projection head, shown in Fig. 11.

It will be understood that the following description of the construction and operation of the "combination dental X-ray projector and cabinet" is intended as explanatory of the invention and not restrictive thereof.

In the drawings, the same reference numerals designate the same parts throughout the various views, except where otherwise indicated.

One embodiment of the construction, shown in Figs. 1,

2, 3, 5 and 6, may be supported by a sectional floor type of cabinet 10, made of sheet metal, with a projecting head 11, adjustably attached to the cabinet by a pair of pivotally connected arms 12 and 13, in such a manner that the projecting head forms the top of the cabinet, when mounted in the closed position, shown in Fig. 6.

The projection head shown in Figs. 1, 2, 3 and 4 may be mounted within a case 15, of substantially rectangular form, the walls of the case blending smoothly into the upper end of the cabinet walls, in the closed position.

The continuous film illuminated by the projecting head, may be in the form of a wide continuous film band 16, made of a thin plastic sheet material, or similar thin sheet, with a series of dental X-ray photographs 17, of rectangular form, either inserted in the corresponding openings 18 formed in the continuous film band, or printed directly on the film band, where a light-sensitive film, such as a coated cellulose acetate strip is utilized. The X-ray photographs are mounted on the film band in sets of three, or in other suitable arrangement, each three photographs constituting a single frame, as indicated in Fig. 9.

One or more of the openings 18, formed in the film band, as indicated in Fig. 4, may be left open to enable an individual X-ray film, or a group of films in a frame, mounted on a card, to be illuminated and projected by the projecting head, in a manner hereinafter described.

The film band 16 may be driven by a pair of wide rollers 20 and 21, mounted adjacent the two ends of the projecting head case in the manner indicated in Fig. 3.

Each of the drive rollers 20 and 21, may be supported by stub shafts 22 and 23, projecting beyond the ends of the roller, the stub shafts being individually trunnioned in bushings 24 and 25, attached to the auxiliary support members 26 and 26a, of the projecting head case, respectively, in the manner indicated in Fig. 3. The sides of the film band may be maintained in contact with each of the rollers by a pair of formed spring clips 27, attached to the rear wall of the projector case, as indicated in Fig. 1, or by other suitable means.

The forward or projecting section of the film band, which is substantially parallel to the forward wall of the projector case may be supported by a pair of guide members 28, of L-shaped or other suitable form, the guide members being attached to the auxiliary support members of the case, by a pair of angles. The two ends of the guide members may be of arcuate contour in the form of substantially circular quadrants 29 and 29a, one pair of guide member quadrants guiding the film band from the roller 20 toward the horizontal section of the guide members, the opposite quadrant guiding the film band from the horizontal section, toward the opposite roller 21, as indicated in Fig. 1.

The rollers may be driven by a reversible electric motor 30, fitted with a built-in reduction gear speed reducer, to reduce the motor speed to the speed required to drive the film support rollers, the motor being mounted substantially in the center of the projecting head case, as indicated in Fig. 1, or in another suitable location in the case, through a pair of coiled spring belts 31 and 32, of circular or other suitable cross-section, each of said belts being driven by a grooved pulley 33 or 34, attached to the projecting end of the motor driven speed reducer shaft 35, as indicated in Figs. 1 and 2.

The opposite ends of the belts 31 and 32, engage a similar pair of grooved pulleys 36 and 37, mounted on the roller stub shafts 23 and 23a, respectively, thereby rotating both rollers in the same direction as the motor shaft is driven.

The roller drive pulleys 36 and 37 are of larger diameter than the motor speed reducer pulleys, to further step down the motor speed beyond that obtained with the reduction drive gearing, the ratio between the roller drive pulleys depending upon the stepped down motor speed, and the speed at which the film band 16, and consequently the drive rollers are to be driven.

While the speed of the film band may be varied to suit particular service requirements, and would depend upon particular operating conditions, it would normally be driven at a linear speed of approximately thirty feet per minute, the operating speed being essentially the same in both directions. The reduction gear mechanism, built into the motor, would be selected to run the roller drive pulleys at the speed required to obtain the required film band speed.

A window 39, made of flat glass, or a similar transparent material, may be supported between a set of Z-section frame members 40, attached to the forward wall of the projection head case, and a set of ledges 40a, riveted or otherwise attached to a set of formed angles, which are attached to the top and bottom walls of the case, as indicated in Fig. 3. The window is located substantially parallel to the outer surface of the film band in the projecting position, as indicated in Figs. 1 and 3.

A pair of channels formed between the Z-section members 40, and a set of angle members 40b, of right angle cross-section, each of which is attached to one leg of the corresponding Z-members, may be utilized to slidably support individual X-ray cards, containing a set of three or more X-ray photographs in front of the window 39. The photographic films mounted in the card may be illuminated through the openings 18, formed through the film band, as hereinbefore described.

One or more long fluorescent lamps 41 may be mounted within the case, substantially parallel to the projecting section of the film band, the contact ends of the fluorescent lamps being supported by a pair of brackets, attached to the walls of the projecting head case.

A long polished reflector 42, of arcuate cross-section may be mounted within the case, adjacent the fluorescent lamp 41, the sides of the reflector being supported by a plurality of brackets 43, attached to the auxiliary support members 26 and 26a, supported by the walls of the case.

The cross-section of the arcuate reflector, would be such as to project the light from the fluorescent lamp, over the entire surface area of the film band in the projecting position.

As indicated in the wiring diagram Fig. 8, and the projecting head control panel 44, shown in Fig. 10, the motor would be selectively controlled by a pair of snap switches 45 and 46, mounted on the control panel, one switch 45, operating the motor in one direction, to move the film band in the forward direction, the other switch reversing the direction of the motor to rewind the film band, by moving it in the opposite direction.

In order to progressively move the film band so that one set or frame of X-ray photographs, generally about three photographs, may be projected intermittently, the pair of intermittent snap switches 45 and 46 may be mounted on the control panel, the intermittent switch 45 selectively controlling the movement of the film band in the forward direction, the auxiliary intermittent switch 46, reversing the motor direction, where intermittent operation, in the reverse direction is desired.

When one of the snap switches 45 is closed, the current flows through the switch 45, thence through the normally closed micro-switch 49 to the motor, thus operating the motor in one direction.

In order to reverse the motor, the reverse snap switch 46 is closed after the snap switch 45 is reopened, the current flowing through the normally closed micro-switch 52 to the motor, thus reversing the motor.

The switches 45 and 46 may be combined into a reversing knife switch in which the current flows in one direction when the switch is thrown in one direction, the flow of current being reversed when the switch is thrown in the opposite direction, thus automatically opening the switch opposite the closed switch.

A normally closed micro-switch 49 having a roller 50, or other suitable engaging means, attached to the control arm thereof, may be mounted adjacent the film band, in

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the manner indicated in Fig. 9, the roller engaging one of a series of slots or indentations 51, formed in one side of the film band, as indicated in Fig. 9, to open the micro-switch and shut off the flow of current to the motor, when the required number of photographs in a frame, three as shown in Fig. 9, have been moved into the projecting position, in one direction.

Another normally closed micro-switch 52, having a similar roller fitted to the control arm thereof, may be located with its engaging roller 50a in substantial alignment with the slot 51a, formed in the film band, the slot being spaced approximately one frame from the slot 51, to shut off the flow of current to the motor when the film band has reached the end of its movement in the opposite direction, in substantially the same manner.

The micro-switches 49 and 52 may be located a sufficient distance ahead of the projecting position of the photograph frame in either direction, to allow the requisite number of projecting X-ray photographs to reach the point of projection, at substantially the center of the window 39, before the motor comes to a stop after the flow of current is shut off, the slots 51 and 51a formed in the edge of the film band being longitudinally offset a sufficient distance from the end of the corresponding frame, the center of the space between adjacent photographs, to provide a sufficient time lag to allow the motor to come to a stop, with the frame in the proper projecting position, relative to the window, or an electrically-operated brake, or a mechanical braking mechanism, may be fitted to the motor shaft or the speed reducer shaft, to arrest the rotation of the motor shaft, when the flow of current to the motor is shut off, thereby reducing the time lag, and approaching instantaneous stopping of the film band, when the flow of current to the motor is shut off by the micro-switches 49 or 52.

For continuous motor operation, a pair of continuous control snap switches 53 and 54 are provided on the control panel, the continuous control switches by-passing the micro-switches 49 and 52 respectively, so that the motor is operated continuously, the film band being moved continuously until the band reaches approximately the required projecting position, after which it is moved to the required position by progressively actuating one of the intermittent switches 45 or 46, after opening both continuous snap switches 53 and 54, to progressively move the film frame into the required projection position, in either direction.

When one of the continuous snap switches 53 is closed, the current flows from the motor line through the snap switch 53 to the motor, thus operating the motor in one direction, the intermittent operation snap switches 45 and 46 being open.

When the snap switch 53 is opened and the opposite continuous snap switch 54 is closed, the current flows from the opposite side of the motor line through the snap switch 54 to the motor, thus operating the motor in the reverse direction.

The continuous snap switches 53 and 54 may be combined into a reversing knife switch, in which the current flows in one direction, when the switch is thrown in one direction, the flow of current being reversed, when the switch is thrown in the opposite direction, thus automatically opening the side of the switch opposite the closed switch.

A separate light switch 55, may be mounted on the control panel, as indicated in the wiring diagram, Fig. 8, the current flowing from a separate light line through the switch 55 to the fluorescent lamp 41, mounted within the projection head case, as hereinbefore described, the current after leaving the lamp, flowing through the ballast 56, mounted in the projection head, and returning to the line. A starter 57, or starting compensator, also mounted in the cabinet, is connected to the terminals at the opposite side of the lamp.

The cabinet 10, which may be made of sheet metal or a similar sheet material may be made in a plurality of sec-

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tions, as indicated in Figs. 5 and 6. The two side walls 58 and 59 of the cabinet, which with the bottom 60 support the entire cabinet structure, may be open, the cabinet being supported by a set of casters 61, which are rotatably supported by the lower end of a set of tubular brackets 62, the upper end of each of which may be attached to one of the side walls of the cabinet.

Two film filing compartments 63, the lower end of each of which may be hingedly attached to the bottom wall of the cabinet, form the lower portion of the front and rear cabinet walls, in the closed position.

A plurality of filing separators 64, may be provided in each of the hinged compartments 63, the separators forming filing slots or spaces for filing and storing X-ray films and records.

The intermediate section 65 of the cabinet, which forms a support for the projection head, is located above the hinged compartments 63, and acts as a frame, supporting the entire cabinet structure.

The intermediate section, which is of substantially rectangular cross-section, which is the general cross-section of the entire cabinet, comprises a front and rear wall of arcuate, or other suitable contour, attached to or integral with a portion of the side walls 58 and 59, of the cabinet.

A formed plate bracket 66, the lower end of which may be attached to the upper wall 67 of the intermediate section of the cabinet, serves as a support for the pivoted arms 12 and 13, which adjustably support the projection head.

A pivot support bracket 68, the flanges at the lower end of which may be attached to the upper wall of the bracket 66, by a plurality of bolts 69, or other suitable attaching means, supports a pivot bolt 70, mounted above the center thereof, a socket 71, the lower end of which is trunnioned on the pivot bolt 70, supporting the lower arm 12.

Another pair of pivotally connected sockets 72 and 73, may be attached at the opposite end of the arm 12, as indicated in Figs. 1 and 5, one socket 72 receiving the opposite end of the tubular arm 12, the other socket 73 supporting one end of the projector head support arm 13, the sockets being connected by a central pivot 74.

A sleeve bracket 75 may be attached to the rear wall of the projection head 11, at the opposite end of the tubular arm 13, to rotatably support the projection head.

A cylindrical cavity 76 may be formed in the cylindrical portion of the sleeve bracket 75, to receive the outer end of the tubular arm 13, a tubular bushing 77, inserted in the cylindrical cavity, surrounding the end of the arm, thus enabling the bracket to be rotated about the arm 13.

A collar 78, attached to the tubular arm, adjacent the open end of the sleeve bracket 75, axially locates the arm 13, relative to the sleeve bracket.

A cylindrical stop pin 79, inserted through the outer wall of the cylindrical section of the sleeve bracket, engages one edge 80 of an open slot 81, formed in the end of the tubular arm 13, thereby limiting the angular movement of the sleeve bracket, and the projection head, when the head is rotated about the arm.

When the projection head is mounted in the storage position, shown in Fig. 1, with the window located at the top of the projection head, the pin 79 engages one edge 80 of the slot 81, formed in the end of the tubular arm, thereby limiting the angular movement of the socket in that direction.

When the projection head is rotated through an angle of 90° to the projection position, shown in Figs. 4 and 7, the pin 79 engages the opposite edge of the slot 81, thereby locating the sleeve bracket and the projecting head in the normal projection position.

A pair of handles 82, may be attached to opposite end walls of the projection head case, as indicated in Figs. 1 and 4, to enable the operator to maneuver the projection head.

A hinged mirror support structure may be attached to the bottom wall of the projector head case, in the manner indicated in Fig. 7, to enable a patient to observe the condition of his own teeth, at the same time as he observes the projection of the X-ray photographs mounted in the film band, or individual photographs, projected through openings formed in the film band, in the manner hereinbefore described.

The mirror support structure comprises a substantially horizontal support frame 83, slidably mounted in a pair of slide channel members 84, fitted to the slides thereof, the channel members being attached to the bottom wall of the projector case, with a substantially rectangular mirror frame 85, hingedly attached to the forward end of the support frame 83, by a pivot pin 86, a mirror 87 being mounted in channels formed in the frame 85.

Another substantially rectangular frame 88, hingedly attached to the lower end of the mirror frame 85, by a pivot pin 86a, supports an auxiliary window 89, made of glass or other transparent sheet material, to enable a patient to observe his teeth in the mirror 87, from various angles, while observing the projection of the X-ray photographs through the window 39, in the projection head.

When the mirror 87 is out of use, the mirror frame 85, and the auxiliary window frame 88, may be folded flat against the support frame 83, the frame members being angularly moved about the pivot pins 86 and 86a, respectively, the support frame with the mirror and window frames attached thereto, being slid backward along the slide channels until the entire unit rests in a flat position adjacent the bottom wall of the projection head case, thus enabling the projection head to be fitted to the top of the cabinet, in the position, shown in Figs. 1 and 6.

Figs. 11 and 12 show a modification of the projection head support structure, shown in Figs. 1, 3 and 5, in which the projection head 11 is separately mounted on a pair of pivotally connected tubular arms 90 and 91, attached to a bracket, which may be mounted on a table top 92, a shelf, or other suitable support means, the cabinet 10 being eliminated.

In the construction shown in Figs. 11 and 12, the upper arm 91 is substantially the same as that shown in Figs. 1 and 5, and hereinbefore described. A tubular extension having a substantially spherical ball end 93, formed integral therewith, may be attached to the lower end of the tubular lower arm 90, in the manner shown in Figs. 9 and 10.

The ball end 93 of the tubular extension, may be adjustably clamped between a pair of substantially hemispherical shoes 94 and 95, attached to or formed integral with a bracket 96, which rests on the top of a table or shelf 92, as indicated in Fig. 11 and 12.

The hemispherical shoes 94 and 95 may be clamped to one another against the ball end 93, by a pair of bolts 97, or other suitable clamping means, fitted through a pair of ears, formed integral with each of the shoes, adjacent a slot formed between the shoes. The bolts 97, in the clamping position, press the inner surfaces of the shoes against the ball end of the tubular extension, thereby retaining the lower arm in any desired angular position.

A plurality of bolts or studs 98 may be attached to the base plate of the bracket 96, a movable jaw 99 slidably supported by the bolts 98, engaging the opposite face of the table 92, in substantial alignment with the base plate of the bracket, when a pair of wing nuts 100, or other suitable type of nuts, threadably fitted to the bolts are tightened against the movable jaw 99.

The sleeve bracket 75, attaching one end of the upper arm 91 to the projector case, is substantially the same as that shown in Figs. 1 and 5, the bracket being either rotatably mounted on the outer end of the upper arm 91 in the manner hereinbefore described, thus enabling the position of the projecting head, relative to the arms, to

be adjusted in substantially the same manner, or the bracket may be fixed to the tubular arm.

The pivoted sockets 72 and 73, connecting the opposite end of the arm 91 to the upper end of the arm 90, may be substantially the same as those shown in Figs. 1 and 7, and hereinbefore described, the sockets being connected by a central pivot 74 in substantially the same manner.

In place of the angularly adjustable sleeve bracket 75, shown in Figs. 1 and 11, a fixed bracket may be attached to the bottom wall 101, or the rear wall of the projecting head case, located in the projecting position, shown in Fig. 7, the bracket being fixed to the outer end of the arm 91, thus retaining the projecting head case in the same position, relative to the plane of the arms 90 and 91 at all times, and avoiding the necessity for rotating the projecting head into the projecting position.

In place of the pivotally connected sockets 72 and 73, a pair of sockets, connected by a ball joint, similar to that supporting the tubular extension, attached to the lower end of the arm 90, may be substituted, thus providing an angular adjustment between the upper arm 91, and the lower arm 90, when a fixed sleeve bracket is used to support the projector case.

The individual photographs mounted in an individual frame on the film band may be equally spaced, as indicated in Fig. 9, the spacing between adjacent photographs at the start and finish of a frame being greater than that between intermediate photographs, to allow a greater adjustment in stopping the motor to show a specific film frame through the window.

The reduction gear speed reducer attached to the motor may be of the spur gear planetary type, or a combination of bevel and spur gears, or any other suitable reduction gearing may be substituted to obtain the final reduction gear shaft speed required.

The belts driving the film roller pulleys from the motor reduction gear shaft may be of the circular coiled spring type, as indicated in Fig. 1, or a belt of circular cross-section made of rubber, leather, or plastic material, or a V-belt may be substituted therefor, the contour of the grooves in both the motor speed reducer pulley, and the roller drive pulleys following the contour of the belt used.

In place of a single fluorescent lamp, shown in Fig. 1, two or more fluorescent lamps, mounted parallel to one another in either the same plane or in parallel planes may be substituted therefor, the contour of the reflector being altered to suit the number of fluorescent lamps used.

In place of the micro-switches used to engage the slots formed in the side of the film band to shut off the flow of current to the motor and therefore control the movement of the film band, a pair of photocells, operated in conjunction with openings formed in the film band, in place of the slots cut through the edge thereof, may be substituted, the photocells controlling the stopping of the motor in substantially the same manner as the micro-switches.

The width of the film band may be wide enough to accommodate a single row of X-ray photographs, as indicated in Fig. 9, or a wider film band accommodating two or more rows of photographs located parallel to one another or in any other suitable position, may be substituted therefor.

The overall length of the film band would be determined by the spacing between the film band support rollers.

The size of the projection head case would be determined by the width of the film band, the size of the film band support rollers and the spacing between the rollers.

It will be apparent to those skilled in the art that my present invention is not limited to the specific details described above and shown in the drawings, and that

various modifications are possible in carrying out the features of the invention and the operation, actuation, and utilization thereof, without departing from the spirit and scope of the appended claims.

What I claim is:

1. A combination film storage cabinet and illuminating apparatus, comprising a cabinet of rectangular cross-section, said cabinet having a pair of side walls, a bottom wall, a pair of angularly movable filing compartments pivotally attached to the bottom wall of the cabinet, the filing compartments forming the front and rear walls of the cabinet, when the filing compartments are located in their closed position, each of said filing compartments having a plurality of filing separators attached thereto, an intermediate section formed at the top of said cabinet, the top of said cabinet being normally open, a wall, substantially perpendicular to the cabinet axis, attached to the walls of said cabinet, below the top thereof, a film projector adjustably attached to said cabinet, said projector comprising a case having front, rear, bottom and side walls, the front wall having an opening cut therethrough, a transparent window mounted in alignment with the front wall opening, means attached to the case walls, supporting said window, a pair of rollers rotatably supported within said case, a continuous film band, having a plurality of openings cut therethrough, driven by said rollers, a plurality of transparent photographic films attached to the film band, in alignment with said openings, a pair of film guides, mounted adjacent the window, slidably supporting the projecting section of the film band, a reversible electrically operated motor mounted in said case, between said rollers, said motor having a speed reducer mechanism, fitted with a rotatably projecting shaft, incorporated therewith, means driving said rollers from the speed reducer shaft, illuminating means mounted in said case behind the projecting section of the continuous film band, a reflector mounted adjacent said illuminating means, switch means independently controlling the operation of said motor in both directions, a pair of arms, comprising an upper and lower arm, adjustably supporting the projector case, means connecting one end of the upper arm to the projector case, means pivotally connecting the adjoining end of said upper and lower arms, means pivotally connecting the opposite end of the lower arm to the cabinet, the outer contour of the projection head case conforming to the outer contour of the open top of the cabinet, said projecting head case being operative to form a closure for the open top of the cabinet when the projection head case is fitted in the open end of said cabinet, when the arms are in the folded position.

2. A combination X-ray film storage cabinet and illuminating apparatus, comprising a cabinet of rectangular cross-section, said cabinet having a pair of side walls, a bottom wall, a pair of angularly movable filing compartments pivotally attached to the bottom wall of the cabinet, the filing compartments forming the front and rear walls of the cabinet, when the filing compartments are located in their closed position, each of said filing compartments having a plurality of filing separators attached thereto, an intermediate section formed at the top of said cabinet, the top of said cabinet being open, a film projector adjustably supported by said cabinet, said projector comprising a case having front, rear, bottom and side walls, the front wall having an opening cut therethrough, a transparent window mounted in alignment with the front wall opening, a pair of rollers rotatably supported within said case, a continuous film band, having a plurality of openings cut therethrough, driven by said rollers, the projecting section of said film band being substantially parallel to the window, a plurality of transparent X-ray films attached to the film band in alignment with said openings, a pair of film guides, mounted adjacent said window, slidably supporting the projecting section of the film band, a reversible

electrically operated motor mounted in said case, between said rollers, said motor having a speed reducer mechanism, fitted with a rotatable projecting shaft, incorporated therewith, a pair of drive pulleys mounted on said speed reducer shaft, means driving the rollers from the speed reducer shaft pulleys, illuminating means mounted in said case behind the projecting section of the continuous film band, a reflector mounted adjacent said illuminating means, switch means independently controlling the operation of said motor in both directions, a pair of angularly mounted tubular arms adjustably supporting the projector case, means pivotally connecting one end of said arms, a socket attached to one wall of the projector case, means rotatably supporting the free end of one of said tubular arms within the socket, means pivotally connecting the free end of the other arm to the cabinet, the outer contour of the projection head case conforming to the outer contour of the open top of the cabinet, said projecting head case being operative to form a closure for the open top of the cabinet, when the projection head case is fitted in the open end of said cabinet, when the arms are in the folded position.

3. A combination X-ray film storage cabinet and illuminating apparatus, comprising a cabinet, of substantially rectangular cross-section, said cabinet having a pair of side walls, a bottom wall, a pair of angularly movable filing compartments pivotally attached to the bottom wall of the cabinet, the filing compartments forming the front and rear walls of the cabinet, when the filing compartments are located in their closed position, each of said filing compartments having a plurality of filing separators attached thereto, an intermediate section formed at the top of said cabinet, the top of said cabinet being normally open, a film projector adjustably supported by said cabinet, said projector comprising a case having front, rear, bottom and side walls, the front wall of said case having an opening cut therethrough, a transparent window mounted in alignment with the front wall opening, means supporting said window, a pair of rollers rotatably supported within said case, a continuous film band, having a plurality of openings cut therethrough, driven by said rollers, the projecting section of said film band being substantially parallel to the window, a plurality of transparent X-ray films attached to the film band in alignment with said openings, means mounted adjacent said window, slidably supporting the projecting section of the film band, a reversible electrically operated motor mounted in said case, said motor having a speed reducer mechanism, fitted with a rotatable projecting shaft, incorporated therewith, means driving the rollers from the speed reducer shaft, illuminating means mounted in said case behind the projecting section of the continuous film band, a reflector mounted adjacent said illuminating means, switch means independently controlling the operation of said motor in both directions, a pair of angularly mounted tubular arms adjustably supporting the projector case, means pivotally connecting one end of said arms, a socket attached to one wall of the projector case, means rotatably supporting the free end of one of said tubular arms within the socket, a pin inserted through said socket, the arm having an arcuate slot cut through one end thereof, the ends of said support arm slot engaging the socket pin to limit the angular movement of the arm in both directions, means pivotally connecting the free end of the other arm to the cabinet, the outer contour of the projector case conforming to the outer contour of the open top of the cabinet, said projector case being operative to form a closure for the open top of the cabinet, when the projector case is fitted in the open end of said cabinet, when the arms are in the folded position.

4. A combination film storage cabinet and illuminating apparatus, comprising a cabinet of substantially rectangular cross-section, said cabinet having a pair of side walls, a bottom wall, a pair of angularly movable filing compartments pivotally attached to the bottom wall

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of the cabinet, the filing compartments forming the front and rear walls of the cabinet, when the filing compartments are located in their closed position, each of said filing compartments having a plurality of filing separators attached thereto, an intermediate section formed at the top of said cabinet, the top of said cabinet being normally open, a plate attached to the walls of said cabinet, perpendicular to the cabinet axis, below the top thereof, a film projector adjustably supported by said cabinet, said projector comprising a case having front, rear, bottom and side walls, the front wall having an opening cut therethrough, a transparent window mounted in alignment with the front wall opening, means supporting said window, a pair of rollers rotatably supported within said case, a continuous film band, having a plurality of openings cut therethrough, driven by said rollers, the projecting section of said film band being substantially parallel to the window, a plurality of transparent photographic films attached to the film band in alignment with said openings, means slidably supporting the projecting section of the film band, a reversible electrically operated motor mounted in said case, said motor having a speed reducer mechanism, fitted with a rotatable projecting shaft, incorporated therewith, means driving the rollers from the speed reducer shaft, illuminating means mounted in said case behind the projecting section of the continuous film band, a reflector mounted adjacent said illuminating means, switch means independently controlling the operation of said motor in both directions, a pair of angularly mounted tubular arms, comprising an upper and lower arm, adjustably supporting the projector case, means pivotally connecting one end of said arms, a socket attached to one wall of the projector case, means rotatably supporting the free end of the upper tubular arm within the socket, a formed plate bracket attached to the cabinet plate, a pivot support bracket attached to said plate bracket, a pivot pin mounted in said bracket, a socket trunnioned on said pivot pin, said socket supporting one end of the lower support arm, the outer contour of the projector case conforming to the outer contour of the open top of the cabinet, said projector case being operative to form a closure for the open top of the cabinet, when the projector case is fitted in the open end of said cabinet, when the arms are in the folded position.

5. A combination film storage cabinet and illuminating apparatus, comprising a cabinet of rectangular cross-section, said cabinet having a pair of side walls, a bottom wall, a pair of filing compartments pivotally attached to the bottom wall of said cabinet, said compartments forming the front and rear walls of the cabinets, an intermediate section of rectangular cross-section formed at the upper end of said cabinet, the top of said intermediate section being open, a film projector adjustably attached to the intermediate section of said cabinet, said projector comprising a case having front, bottom and side walls, the front wall having an opening cut therethrough, a transparent window mounted in alignment with said opening, means supporting said window, a pair of rollers rotatably mounted within said case, a continuous film band, having a plurality of openings cut therethrough, driven by said rollers, the projecting section of said film band being substantially parallel to the window, a plurality of transparent photographic films attached to the film band in alignment with said openings, means mounted adjacent the window, slidably supporting the projecting section of the film band, a reversible electrically operated motor mounted in said case, between said rollers, said motor having a speed reducer mechanism, fitted with a rotatable projecting shaft, incorporated therewith, means driving the rollers from the speed reducer shaft, illuminating means mounted in said case behind the projecting section of the continuous film band, a reflector mounted adjacent said illuminating means, switch means controlling the operation of said motor in both direc-

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tions, a pair of angularly mounted arms adjustably supporting the projector case, means pivotally connecting one end of said arms, a socket attached to one wall of the projector case, means rotatably supporting the free end of one of said arms within the socket, means pivotally connecting the free end of the other arm to the intermediate section of the cabinet, the outer contour of the projection head case conforming to the outer contour of the open top of the cabinet, said projection head case being operative to form a closure for the open top of the cabinet, when the projection head case is fitted in the open end of the intermediate section of the cabinet, when the arms are in the folded position.

6. A combination X-ray film storage cabinet and illuminating apparatus, comprising a cabinet of rectangular cross-section, said cabinet having a pair of side walls, a bottom wall, a pair of filing compartments pivotally attached to the bottom wall of said cabinet, forming the front and rear walls of the cabinet, each of said compartments having a plurality of filing separators attached thereto, an intermediate section formed at the upper end of said cabinet, the top of said intermediate section being open, a film projector adjustably attached to the intermediate section of said cabinet, said projector comprising a case having front, bottom and side walls, the front wall having an opening cut therethrough, a transparent window mounted in alignment with said opening, means supporting said window, a pair of rollers rotatably supported within said case, a continuous film band, having a plurality of openings cut therethrough, driven by said rollers, the projecting section of said film band being substantially parallel to the window, a plurality of transparent X-ray films attached to the film band in alignment with said openings, means slidably supporting the projecting section of the film band, a reversible electrically operated motor mounted in said case, said motor having a speed reducer mechanism, fitted with a rotatable projecting shaft, incorporated therewith, means driving the rollers from the speed reducer shaft, illuminating means mounted in said case adjacent the projecting section of the continuous film band, a reflector mounted adjacent said illuminating means, switch means independently controlling the operation of said motor in both directions, a pair of angularly mounted arms adjustably supporting the projector case, means pivotally connecting one end of said arms, a socket attached to one wall of the projector case, means rotatably supporting the free end of one of said arms within the socket, means pivotally connecting the free ends of the other arm to the intermediate section of the cabinet, the outer contour of the projection head case conforming to the outer contour of the open top of the cabinet, said projection head case being operative to form a closure for the open top of the cabinet, when the projection head case is fitted in the open end of the intermediate section of the cabinet, when the arms are in the folded position.

7. A combination film projector case and film storage cabinet, comprising a cabinet of rectangular cross-section, said cabinet having a pair of side walls, a bottom wall, a pair of filing compartments pivotally attached to the bottom wall of said cabinet, said filing compartments forming the front and rear walls of the cabinet, each of said filing compartments having a plurality of filing separators attached thereto, an intermediate section formed at the upper end of said cabinet, the top of said intermediate section being open, a film projector adjustably fitted to the intermediate section of said cabinet, said film projector including a case having front, bottom and side walls, the front wall having an opening cut therethrough, a socket attached to the film projector case, a projector case support arm rotatably fitted to said socket, an auxiliary arm pivotally attached to the intermediate section of the cabinet, the opposite end of said auxiliary arm pivotally supporting the projector case support arm, the cross-section of the projector case conforming to the

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outer contour of the open end of the cabinet to form a top for said cabinet when the projector case is fitted to the open top of the intermediate section of the cabinet, the projector case being operative to fit the open top of the intermediate section of the cabinet, to form the top of the cabinet, when the projector case arm and the intermediate arm are fitted into the cabinet in the folded position.

8. A combination film projector case and film storage cabinet, comprising a cabinet of rectangular cross-section, said cabinet having a pair of side walls, a bottom wall, a pair of filing compartments pivotally attached to the bottom wall of said cabinet, said filing compartments forming the front and rear walls of the cabinet, an intermediate section formed at the upper end of said cabinet, the top of said intermediate section being open, a film projector adjustably fitted to the intermediate section of said cabinet, said film projector including a case having front, bottom and side walls, the front wall having an opening cut therethrough, a pair of angularly mounted foldable support arms connecting the projector case to the cabinet, means pivotally connecting one end of said support arms, a socket attached to one wall of the projector case, means rotatably supporting the free end of one of said support arms within the socket, means pivotally connecting the free end of the other support arm to the intermediate section of the cabinet, the outer contour of the projector case conforming to the outer contour of the open top of the intermediate section of the cabinet, said projector case being operative to form a closure for the open top of the cabinet, when the projector case is fitted to the open top of the intermediate section of the cabinet, while the projector case support arms are fitted into the cabinet in the folded position.

9. A combination film projector case and film storage cabinet comprising a cabinet of substantially rectangular cross-section, said cabinet having a pair of side walls, a bottom wall, a pair of filing compartments pivotally attached to the bottom wall of said cabinet, said filing compartments forming the front and rear walls of the cabinet, each of said filing compartments having a plurality of filing separators attached thereto, an intermediate section formed at the upper end of said cabinet, the top of said intermediate section being open, a film projector adjustably fitted to the intermediate section of said cabinet, said film projector including a case having front, bottom and side walls, the front wall of said case having an opening cut therethrough, a support socket attached to one wall of the projector case, a projector case support arm having one end thereof rotatably fitted to the support socket, said support arm being operative to adjustably support the projector case, an angularly positioned auxiliary arm connecting the projector case support arm to the cabinet, means pivotally connecting one end of the projector case support arm to the auxiliary arm, a mounting bracket attached to the intermediate section of the cabinet, a pivot support bracket fixedly attached to the mounting bracket, pivot means attached to the pivot support bracket pivotally supporting the adjacent end of the auxiliary arm, the outer contour of the projector case conforming to the outer contour of the open top of the intermediate section of the cabinet, said projector case being operative to form a closure for the open top of the cabinet, when the projector case is fitted to the open top of the intermediate section of the cabinet, the projector case support arm and the auxiliary arm being located within the cabinet, in a folded position.

10. A combination film projector case and film storage cabinet comprising a cabinet of substantially rectangular cross-section, said cabinet having a pair of side walls, a bottom wall, a pair of filing compartments pivotally attached to the bottom wall of said cabinet, said filing compartments forming the front and rear walls of the cabinet, each of said filing compartments having a plural-

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ity of filing separators attached thereto, an intermediate section formed at the upper end of said cabinet, the top of said intermediate section being open, a film projector adjustably fitted to the intermediate section of said cabinet, said film projector including a case having front, bottom and side walls, the front wall of said case having an opening therethrough, a support socket attached to the projector case, a projector case support arm having one end thereof rotatably fitted to the support socket, said support arm being operative to adjustably support the projector case, an angularly positioned tubular auxiliary arm connecting the projector case support arm to the cabinet, means pivotally connecting one end of the projector case support arm to the auxiliary arm, a mounting bracket attached to the intermediate section of the cabinet, a pivot support bracket fixedly attached to the mounting bracket, a pivot bolt attached to the pivot support bracket pivotally supporting the adjacent end of the auxiliary arm, the cross-sectional contour of the projector case side wall conforming to the outer contour of the open top of the intermediate section of the cabinet, said projector case being operative to form a closure for the open top of the intermediate section of the cabinet, when the projector case is fitted to the open top of the intermediate section of the cabinet, while the projector case support arm and the auxiliary arm are fitted into the cabinet, the projector case support arm and the intermediate arm being in a folded position, the projector case being mounted on the top of the intermediate section of the cabinet.

11. A combination film projector case and portable film storage cabinet comprising a cabinet of substantially rectangular cross-section, said cabinet having a pair of side walls, a bottom wall, a pair of filing compartments pivotally attached to the bottom wall of said cabinet, said filing compartments forming the front and rear walls of the cabinet, an intermediate section formed at the upper end of said cabinet, the top of said intermediate section being open, a tubular frame structure attached to the side walls of the cabinet supporting said cabinet, rotatable means attached to said tubular frame movably supporting the frame structure and the cabinet, a film projector adjustably fitted to the intermediate section of said cabinet, said film projector including a case having front, bottom and side walls, the front wall of said case having an opening therethrough, a support socket attached to one wall of the projector case, a projector case support arm having one end thereof rotatably fitted to the support socket, said support arm being operative to adjustably support the projector case, an angularly positioned auxiliary arm connecting the projector case support arm to the cabinet, means pivotally connecting one end of the projector case support arm to the auxiliary arm, a mounting bracket attached to the intermediate section of the cabinet, a pivot support bracket fixedly attached to the mounting bracket, pivot means attached to the pivot support bracket pivotally supporting the adjacent end of the auxiliary arm, the outer contour of the projector case conforming to the outer contour of the open top of the intermediate section of the cabinet, said projector case being operative to form a closure for the open top of the cabinet, when the projector case is fitted to the open top of the intermediate section of the cabinet, the projector case support arm and the auxiliary arm being located in a folded position within the cabinet.

12. A combination film projector case and portable film storage cabinet, comprising a cabinet of substantially rectangular cross-section, said cabinet having a pair of side walls, a bottom wall, a pair of filing compartments pivotally attached to the bottom wall of said cabinet, said filing compartments forming the front and rear walls of the cabinet, an intermediate section formed at the upper end of said cabinet, the top of said intermediate section being open, a tubular frame structure attached to the side walls of said cabinet supporting the

cabinet, a plurality of casters attached to said frame structure movably supporting the frame structure and the cabinet, a film projector adjustably fitted to the intermediate section of said cabinet, said film projector including a case having front, bottom and side walls, the front wall of said case having an opening therethrough, a socket attached to one wall of the projector case, a projector case support arm mounted adjacent the projector case, means rotatably supporting one end of said support arm within the socket, said support arm being operative to adjustably support the projector case, an angularly positioned tubular auxiliary arm connecting the projector case support arm to the cabinet, means pivotally connecting one end of the projector case support arm to the auxiliary arm, a mounting bracket attached to the intermediate section of the cabinet, a pivot support bracket fixedly attached to the mounting bracket, a pivot member attached to the pivot support bracket pivotally supporting the adjacent end of the auxiliary arm, the outer contour of the projector case conforming to the outer contour of the open top of the intermediate section of the cabinet, said projector case being operative to form a closure for the open top of the cabinet, when the projector case is fitted to the open top of the intermediate

section of the cabinet, the projector case support arm and the intermediate arm being located in a folded position within the cabinet.

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