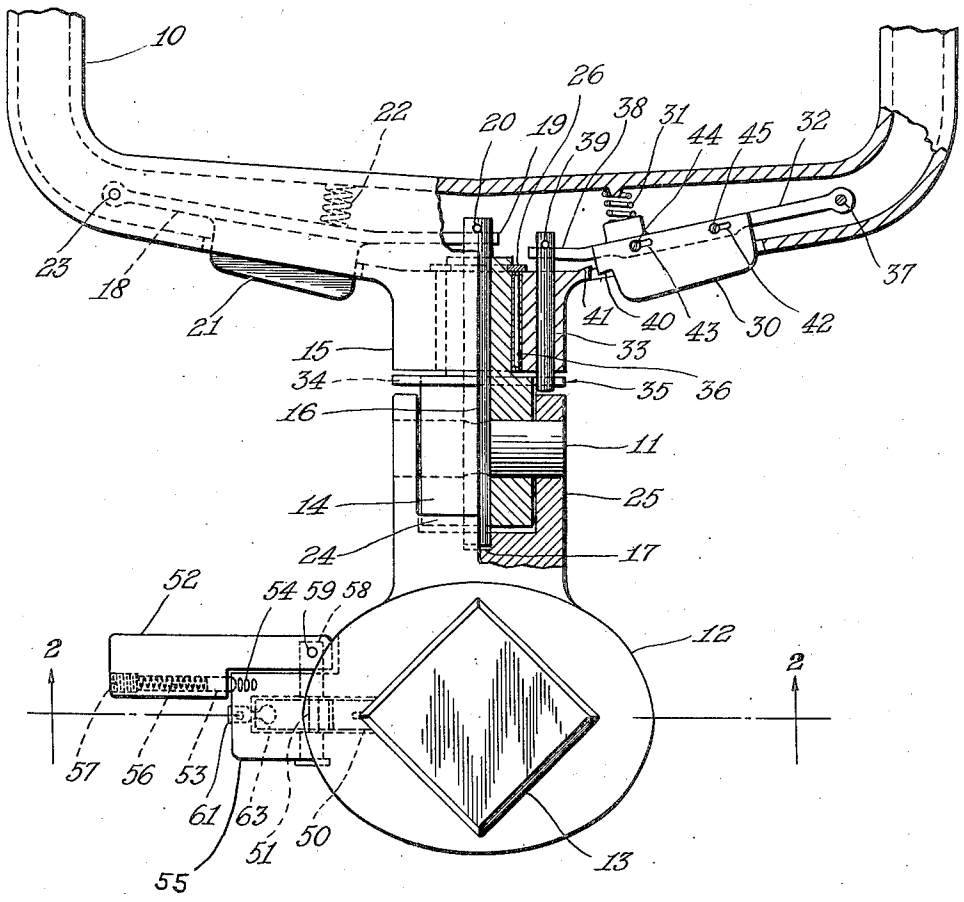
Jan. 17, 1950 W. KES 2,495,106

LOCKING BRACKET

Filed Oct. 12, 1946 2 Sheets-Sheet 1

FIG. 1.



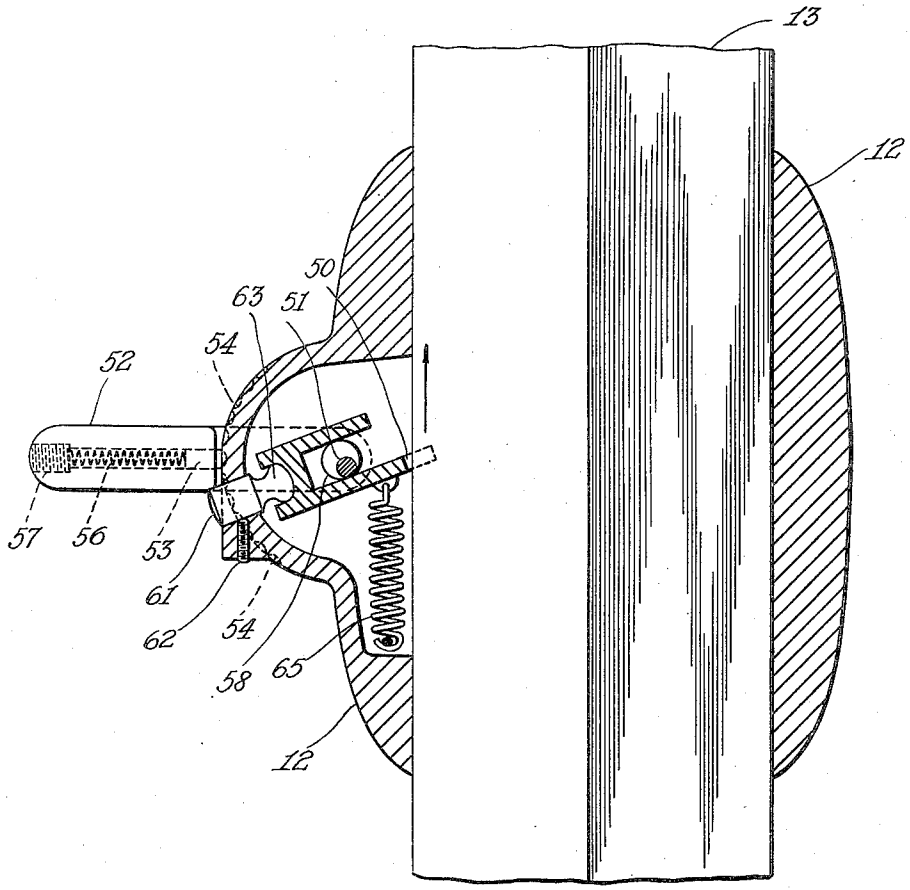
INVENTOR
WILLIAM KES
BY
AGENT

Jan. 17, 1950 W. KES 2,495,106

LOCKING BRACKET

Filed Oct. 12, 1946 2 Sheets-Sheet 2

Fig. 2.



INVENTOR
WILLIAM KES
BY
AGENT

Patented Jan. 17, 1950

2,495,106

UNITED STATES PATENT OFFICE

2,495,106

LOCKING BRACKET

William Kes, Bronx, N. Y., assignor, by mesne assignments, to Philips Laboratories, Inc., Irvington on Hudson, N. Y., a corporation of Delaware

Application October 12, 1946, Serial No. 702,914

4 Claims. (Cl. 248—125)

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My invention relates to a device for positioning the fluorescent screen of an X-ray apparatus. More particularly, the invention relates to a fluorescent screen holder which is selectively movable along a column and which may be conveniently rotated while locked in position along the column.

As is well known in the art, counter-balanced screen arms are generally used in connection with X-ray table examinations, the fluorescent screen being carried in a yoke which is slidably mounted on a fluoroscopic tower. For some purposes, e. g., radiographic examinations, it is advisable that the screen be locked in position over the table. However, for the examination of internal organs of the body wherein a permanent photographic record of the organ under study is desired, I have found that it is convenient for the operator to employ a lock which may, if desired, permit movement of the yoke along the column toward the table only. For example, while the yoke is locked against movement away from the table during the examination of internal organs subject to movement, the screen therein may be replaced by a spot film device and the holder may then be compressed against the body to prevent further movement of the organ under study. Moreover, I have found it useful to have the screen rotatable about a central axis in order to facilitate the examination of a patient on the table. Furthermore, after an examination it is often convenient for the holder to be swung away from the table without releasing the lock.

It is an object of my invention to provide a new and novel means for positioning a fluorescent screen, or the like in manner convenient for use in conjunction with an X-ray table which is simple and readily accessible.

It is a further object of my invention to provide a locking mechanism for a fluoroscopic screen holder on a column which permits an operator to effectively arrange the lock, first to lock the holder in position along the column, second to allow it to slide unidirectionally along the column and third to allow it to move freely along the column.

It is a still further object of my invention to provide a holder device for fluorescent screens so that the screen may be rotated about an axis passing through the column.

It is an additional object of the invention to provide a holding device for fluorescent screens so that the screen may be turned away from or toward an X-ray table associated therewith.

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These and further objects of my invention will appear as the specification progresses.

According to the present invention, a yoke adapted to receive the fluorescent screen of the X-ray apparatus is hinged to a holder which is slidably mounted on a fluoroscopic tower or column. The holder houses a locking mechanism comprising a jaw-like member for grasping the column when pressure is applied thereto. The jaw-like member may be selectively positioned so that, in one position the holder is locked to the column; in a second position the holder moves unidirectionally along the column; and in the third position the holder is free to move in either direction along the column. Moreover, means are provided whereby the yoke may be rotated pivotally around its central axis or locked in certain predetermined positions, and further means are provided whereby the yoke may be swung away from or toward the table.

In order that the invention may be more clearly understood and more readily carried into effect it will now be described with reference to the accompanying drawing in which like numerals refer to like parts and in which:

Fig. 1 is an embodiment of the invention in partial cross section; and

Fig. 2 is a cross section of the locking mechanism for holding the screen in position along the column taken along the line 2—2 of Fig. 1.

Referring to Fig. 1, a yoke 10 adapted to hold a fluorescent screen or a spot film device is hinged on a shaft 11 supported by a projection 25 of a housing 12 which surrounds a supporting column 13. The yoke 10 also rotates about swivel member 14 when a locking pin 33 is freed from a slot 34 in an axial projection 35 of swivel member 14. Housing 12, in the position shown, is locked to a supporting column 13 by a jaw-like member 50 which is secured unyieldingly to column 13 by a cam 51.

A detent lever 18 mounted in yoke 10 to pivot about a pin 23 is connected to locking pin 16 which is seated in a slot 17 of projection 25. The head of pin 16 is slotted to receive lever 18 which is prevented from slipping out of the slot by pin 20. When handle 21 is pressed against compression spring 22, detent lever 18 pivots about pin 23 lifting locking pin 16 out of slot 17 permitting shaft 11 to rotate carrying yoke 10 with it. To limit the swing of the yoke, projection 25 is provided with a shoulder 24 in the slotted portion thereof which prevents the yoke from rotating downward, in the position shown in the drawing, toward the column 13.

Swivel member 14 is journalled in a bearing 36 seated in an axial projection 15 of yoke 10 being secured thereto by a locking ring 26 seated in a circular slot of swivel member 14. Detent lever 32 is mounted pivotally on pin 37 in yoke 10 and engages locking pin 33 which is seated, in the locked position shown in the drawing in a slot 34 of axial projection 35 of swivel member 14. A handle 30 is slideably mounted on detent lever 32 and is provided with a curved portion 40 adapted to fit over a shoulder 41 on axial projection 15. Handle 30 is provided with slots 42 and 43 and is slideably secured to detent lever 32 by pins 44 and 45. When handle 30 is depressed inwardly against compression spring 31, locking pin 33 is lifted out of slot 34 and yoke 10 rotates about swivel member 14 journalled in bearing 36 of the axial projection 15. To permit yoke 10 to be continually rotated, handle 30 slides along detent lever 32 until curved portion 40 rests on shoulder 41 holding locking pin 33 away from swivel member 14. Swivel member 14 is provided with a plurality of slots similar to 34, of which two are shown on the drawing, and to lock yoke 10 in any position, handle 30 is released from its locked position allowing pin 33 to seat in one of the slots.

The yoke assembly is supported by a column 13. A housing 12, shown securely locked to the column in the drawing, is arranged for relative movement along column 13. A jaw-like member 50 actuated by a cam 51 unyieldingly grasps a corner of supporting column 13 thus preventing movement of housing 12 along column 13. A handle 52 pinned to shaft 58 rotates cam 51 to free jaw-like member 50 from column 13 to permit selective movement of housing 12 along column 13. To prevent undesired casual movement of handle 52, lock housing 55 is provided with a plurality of notches 54. A pin 53 frictionally seated in one of notches 54 holds handle 52 in position when jaw-like member 50 is set for selective movement or locked to column 13. To provide sufficient friction, a spring 56 held under compression by locking screw 57 applies pressure to pin 53 to prevent casual movement of handle 52.

The operation of the lock can be readily understood by referring to Fig. 2 wherein a sectional view taken along the line 2—2 of Fig. 1 is shown. Jaw-like member 50 angularly grasps column 13 and is secured to housing 12 by a mating member 61. Mating member 61 is locked to the housing by locking screw 62 and has a ball like portion 63 adapted to fit a socket like portion of jaw-like member 50. Cam 51 riding in a slotted portion of the jaw-like member 50 is journalled into housing 12. In the position shown, cam 51 presses against the jaw-like member 50 holding it securely in angular relationship against column 13. When handle 52 is rotated out of notch 54 in a counterclockwise direction, cam 51 rotates counterclockwise away from the inner face of jaw-like member 50, thus relieving the pressure on the jaw-like member 50. Spring 65 having one end secured to housing 12 then holds jaw-like member 50 against column 13 with sufficient pressure to prevent movement of the housing along the column in the direction of the arrow.

The jaw-like member 50 being in angular relationship with column 13, however, rides sufficiently free of column 13 to permit housing 12 to slide in a direction opposing the arrow. Rotating handle 52 further in a counterclockwise direction rotates cam 51 lifting jaw-like portion completely free of column 13 by pressing against the other face of the slotted portion of jaw-like member 50, thus permitting housing 12 to slide bidirectionally along column 13.

With lever 52 rotated to the intermediate position, cam 51 is free of the jaw-like portion 50 and the yoke assembly is free to move in one direction only as shown on the drawing in Fig. 2. This feature makes possible the movement of the screen toward an X-ray table while being locked against motion away from the table. For example, a patient may be placed on an X-ray table for examination of an internal disorder, and the screen may be conveniently placed in a position for making a visual examination of an internal organ under study. The screen can then be replaced by a spot film device and the yoke moved toward the table thus compressing the organ under study to prevent any further movement of the organ while an X-ray photograph is being taken. More particularly, in the examination of an intestinal organ, which may be subject to movement and as such will blur the photograph, it is possible with the compression feature employed in my locking arrangement to hold the organ substantially motionless to obtain a clear and sharp radiograph.

While I have described my invention with specific examples and applications, other variations thereof will be apparent to those skilled in the art without departing from the spirit and scope of my invention.

What I claim is:

1. In an X-ray apparatus, a locking device for selective movement of a holder for fluorescent screens and the like along a column comprising a housing slidably engaging said column, a member within said housing having one portion swivel joined to a mating member secured to said housing and having a jaw-like portion adapted to bear angularly against said column, said member also having a slotted portion, and a cam journalled in said housing and riding in said slotted portion whereby said cam may be selectively positioned first to cause said jaw-like portion to positively grasp said column in fixed position, second to cause said jaw-like portion to be free of the cam and thereby permit unidirectional motion of said housing along said column, and third to cause said jaw-like portion to be lifted free of said column to permit bidirectional motion of said housing along said column.

2. In an X-ray apparatus, a device for selective movement of a holder for fluorescent screens and the like comprising a column, a housing slidably engaging said column, a member within said housing having one portion swivel joined to a mating member secured to said housing and having another jaw-like portion adapted to bear angularly against said column, said member also having a slotted portion, means to hold said jaw-like portion against said column, and a cam journalled in said housing and riding in said slotted portion whereby said cam may be selectively positioned first to cause said jaw-like portion to positively grasp said column in fixed position, second to cause said jaw-like portion to be free of the cam and thereby permit unidirectional motion of said housing along said column, and third to cause said jaw-like portion to be lifted by said cam free of said column to permit bidirectional motion of said housing along said column.

3. In an X-ray apparatus, a device for selective movement of a holder for fluorescent screens

and the like along a column comprising a housing slidably engaging said column, a member within said housing having one portion swivel joined to a mating member secured to said housing and having another jaw-like portion adapted to bear angularly against said column, said member also having a slotted portion, means to hold said jaw-like portion against said column, a cam journalled in said housing riding in said slotted portion, and manually operable control means operatively associated with said cam whereby said cam may be selectively positioned, first to cause said jaw-like portion to positively grasp said column in fixed position, second to cause said jaw-like portion to be free of the cam and thereby permit unidirectional motion of said housing along said column, and third to cause said jaw-like portion to be lifted by said cam free of said column to permit bidirectional motion of said housing along said column.

4. In an X-ray apparatus, a device for selective movement of a holder for fluorescent screens and the like along a column comprising a housing slidably engaging said column, a member secured to said housing having a spherical portion thereof, a second member within said housing having a portion which is adapted to rock about said

spherical portion and having another jaw-like portion adapted to bear angularly against said column, said second member also having a slotted portion, a spring adapted to hold said jaw-like portion against said column, a cam journalled in said housing and riding in said slotted portion of said second member, and a lever operatively associated with said cam whereby said cam may be selectively positioned to cause said jaw-like portion to positively grasp said column in fixed position, second to cause said jaw-like portion to be free of said cam and thereby permit unidirectional motion of said housing along said column, and third to cause said jaw-like portion to be lifted by said cam free of said column to permit bidirectional motion of said housing along said column.

WILLIAM KES.

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