Sept. 19, 1944. W. C. DE VRY 2,358,692

FILM REEL SUPPORT FOR PORTABLE PROJECTORS

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Fig. 2.

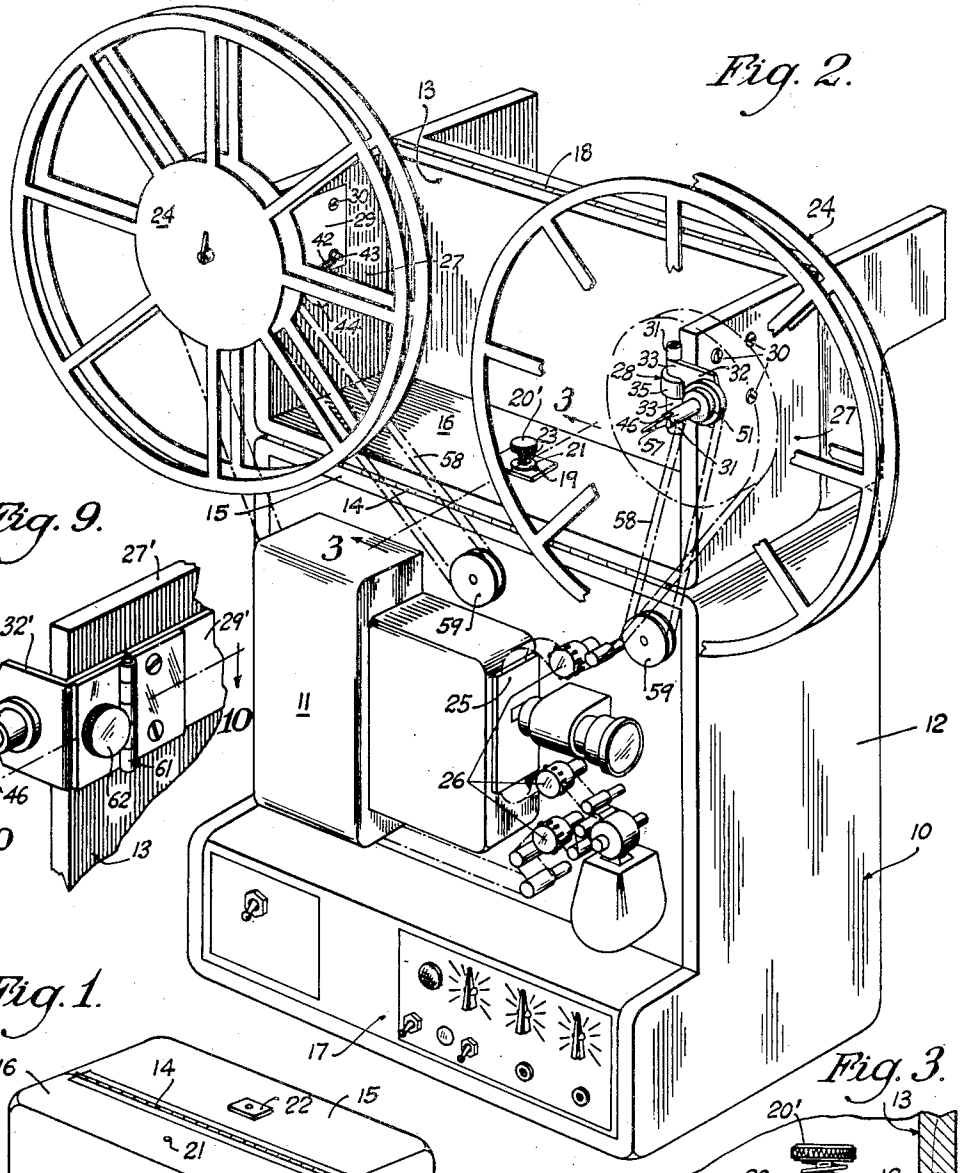

Fig. 9.

Fig. 1.

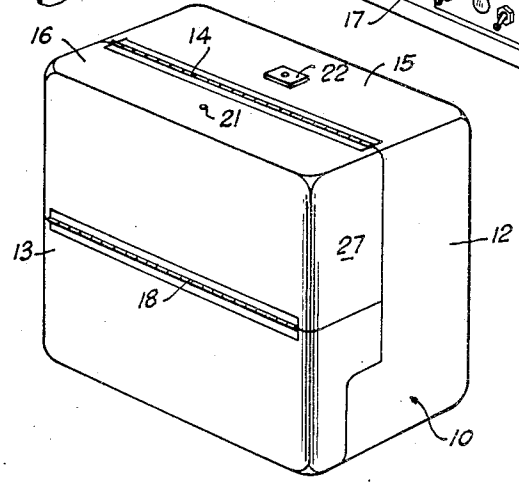

Fig. 3.

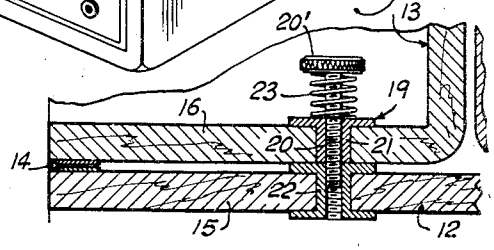

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Fig. 4.

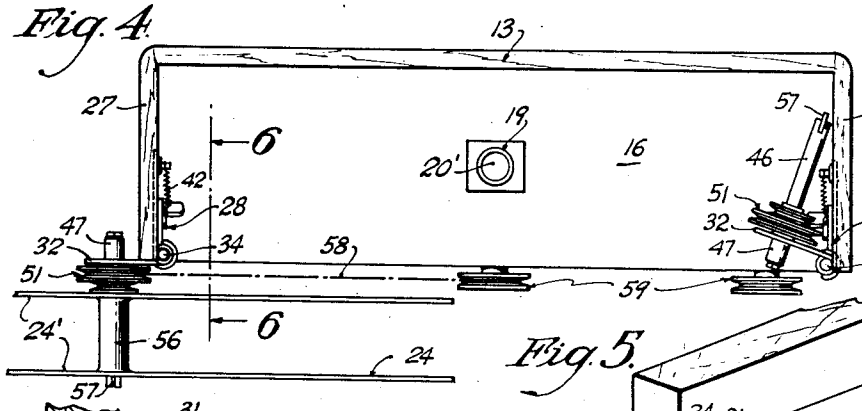

Fig. 5.

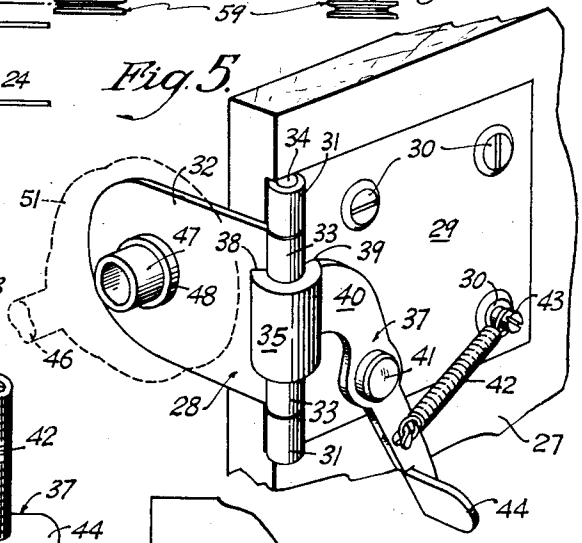

Fig. 8.

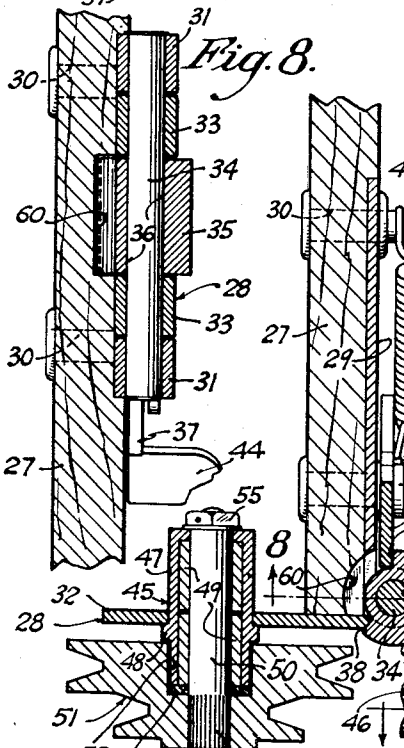

Fig. 6.

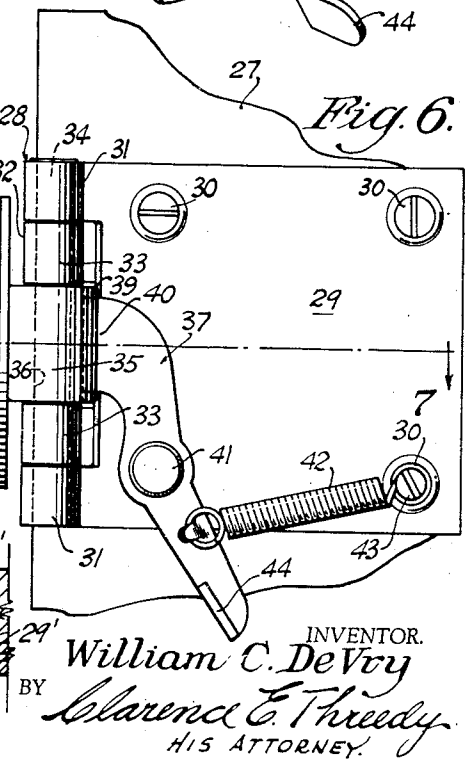

Fig. 7.

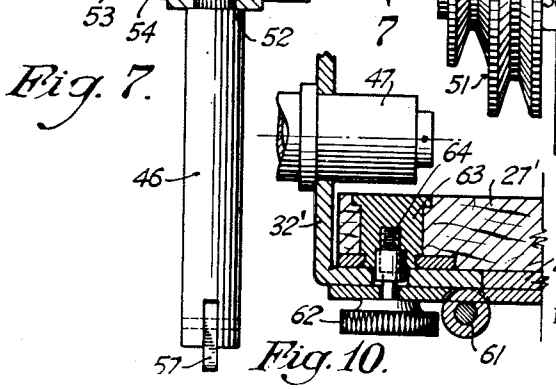

Fig. 10.

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2,358,692

UNITED STATES PATENT OFFICE

2,358,692

FILM REEL SUPPORT FOR PORTABLE PROJECTORS

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Application April 15, 1943, Serial No. 483,095

9 Claims. (Cl. 242—55)

This invention relates to portable motion picture projecting apparatus and more particularly to film reel supports especially adapted for use in portable projectors and has as its principal object the provision of such a support as will be simple in construction, economical in manufacture and highly efficient in use.

Another object of this invention is to provide in portable equipment a movable and collapsible support for a high-speed portion of a projector mechanism.

It is another object of my invention to provide a sturdy support for a movable element in a projector unit which support permits of facile retraction when not in use.

A further object of this invention is to provide in portable motion picture projectors a substantial reel support which will maintain high-speed reels in alignment with feed and drive means as a unitary structure and yet permit of a quick and simple disassembly to facilitate collapsibility of the portable projector.

Still another object of this invention is to provide a novel locking means for a swinging bracket support whereby to maintain the support rigid when in extended condition for use.

A still further object of my invention is to provide an anti-friction support for a high-speed pulley arrangement and for securely arranging such support in a firm and solid relation with respect to the cabinet with which it is associated to minimize vibratory action between such support and cabinet.

Other objects will appear more fully hereinafter.

The invention consists in the novel combination and arrangement of parts to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings showing the preferred form of my invention and in which:

Fig. 1 is a perspective view of a case for a portable motion picture projector in totally collapsed condition;

Fig. 2 is a perspective view of the device shown in Fig. 1 when the latter is opened and assembled for use as a projector;

Fig. 3 is a fragmentary sectional detail through a stabilizer for hinged sections of the portable case as seen along line 3—3 in Fig. 2;

Fig. 4 is a top plan view of the upper section of the portable case showing one reel support in extended condition and ready for use and another swung inward within the confines of the hinged portion of the case;

Fig. 5 is a perspective view of a reel support in extended condition with portions of the pulley drive thereof shown in dotted lines;

Fig. 6 is a side elevational view of the mobile support as seen from line 6—6 in Fig. 4;

Fig. 7 is a horizontal sectional detail through the supporting means as seen from line 7—7 in Fig. 6;

Fig. 8 is a fragmentary vertical sectional detail through the mobile supporting means as seen from line 8—8 in Fig. 7;

Fig. 9 is a perspective view of a modified form of support; and

Fig. 10 is a section thereof as seen along line 10—10 in Fig. 9.

Portable motion picture units are not new and many forms of portability have been employed in the development of this art. This invention contemplates the provision of an improvement in portable projector units whereby to produce a substantially solid and compact motion picture projector having all the benefits of a permanent projector unit and yet permitting of a demountable structure which by simple manipulations facilitates quick setting up of the portable projector.

Referring to the drawings Fig. 1 discloses a compact case 10 within which is contained the essential elements necessary to a complete projector mechanism 11. The case 10 comprises a base section 12 and a cover portion 13 therefore hingedly mounted as at 14 along the mid-region of the top wall 15 of the case thus providing a complementary wall 16 on the cover 13. The cover portion 13 is suitably secured in closed condition as shown in Fig. 1 by latch means (not shown) which may be any one of a number of well known forms of latching means. When unlatched the cover portion 13 is swung open into the position shown in Fig. 2 to expose the projector mechanism 11 and a control panel 17 therefore. The cover portion 13 is preferably, though not necessarily, constructed to break along a hinge line 18 to reduce the height of the cover as shown.

There is provided on the inside face of the complementary wall 16 of the cover 13 a means 19 for stabilizing the cover 13 relative to the base section 12. This means may be any one of a number of well known fastening means. I prefer, however, the stabilizing means 19 illustrated in Figs. 2 and 3 comprising a set-screw 20 threadably connected to a bushing 21 suitably pressed into an opening formed in the complementary wall 16 and in alignment with a like

bushing 22 secured to the top wall 15 of the case. A coil spring 23 surrounds the shank of the set-screw 20 and serves to frictionally engage the head 20' thereof to prevent accidental rotation of the set-screw 20 and permit of manual rotation thereof to screw the set-screw down into the bushing 22 in the top wall 15 of the cover. By this means 19 the cover portion 13 is rigidly secure to the base section 12 to provide a unitary structure between the base and cover.

The unitary structure thus formed provides suitable base means for film winding reels 24 essentially necessary to the completeness of the projector mechanism 11. As is conventional in the arrangement of the reels of a projector the reels 24 are adapted to be supported above the projector mechanism 11 whereby to feed film downwardly into the film gate 25 for movement therethrough by action of sprockets 26 back toward the take-up reel 24'. To this end there is mounted upon the vertically disposed walls 27 of the cover portion 13 a pair of reel supporting brackets 28, one on the left hand, the other on the right. Each of these reel supporting brackets 28 being identical in structure, although inverted with respect to each other, like reference numerals will be employed in the exposition of them, reference being had to Figs. 5 through 8, inclusive.

The bracket 28 includes a mounting plate 29 secured to the inside face of the vertically disposed wall 27 by means of screws 30 or the like and has a pair of trunnions 31 adjacent the vertical open face of the wall 27. Another plate 32 having a pair of aligned boss formations 33 formed on one side edge thereof is disposed to be mounted upon the mounting plate 29 with the boss formations 33 aligned with the trunnions 31. The two plates 29 and 32 are interconnected by a pin 34 which is adapted to rotate in the trunnions 31 and to be pressed into the boss formations 33 and to be tightly gripped thereby. In the course of interconnecting the two plates as aforesaid a keeper block 35 later to be explained, having a vertical passage 36 formed therethrough is disposed between the boss formations 33 with the passage 36 disposed in alignment with the bosses 33 and likewise receiving the pin 34 by a press-fit whereby to unite the plate 32, keeper block 35 and pin 34 into a common mass, movable in unison relative to the trunnions 31 on the mounting plate 29.

As seen in Fig. 7 the mounting plate 29 is seated in a recess formed on the inside face of the wall 27 so as to dispose the hinge connection formed by the trunnions 33 and pin 34 within the cover 13 and at the open front face of the wall 27. In this position both the inside face and the open front face of the vertical wall 27 are tangential with respect to the pin 34 and thus when the plate 32 is in extended condition it will bear against the open front face of the wall 27 to assure that the plate 32 is at right angle with respect to the mounting plate 29 as well as the general breadth of the case 10 and its associated projector mechanism 11. By reason of the foregoing disposition of the bracket 28 there is also provided a solid seat for the movable plate 32 to minimize its vibratory action by reason of the high speed of the reel which it is adapted to support.

Means for latching the movable plate 32 in extended condition is generally indicated at 37 and includes the keeper block 35 hereinbefore referred to. As is disclosed in the drawings (Figs. 7 and 8) the block 35 has a segmental portion thereof reduced in diameter to provide a bearing shoulder 38 and a keeper lug 39. The bearing shoulder 38 is fixed in bearing engagement with the movable plate 32 to transmit a force therefrom in pressing the plate 32 securely against the front face of the vertical wall 27 for reasons hereinbefore explained. The keeper lug 39 is spaced slightly from the inner face of the wall 27 to form a slot adapted to receive a manually operable latch bolt 40. In the present instance the latch bolt 40 is shown pivotally mounted as at 41 on the mounting plate 29 and normally urged in the direction of the keeper lug 39 by a tension spring 42 one end of which is affixed to the pivoted bolt 40 while the opposite end thereof is suitably anchored on an extended portion 43 on one of the mounting screws 30. The latch bolt 40 is provided with a handle 44 by which the bolt 40 may be moved, by hand, away from the keeper lug 39 against the action of the spring 42 whereby to release the movable plate 32 for rotative movement toward the inner confines of the cover portion 13.

The reel supporting bracket 28 is completed by the provision of an anti-friction bearing 45 and a rotatable shaft 46 carried thereby. The bearing 45 includes a housing 47 fixedly mounted with its long axis at right angle to the plate 32 and sweat onto the latter with an annular shoulder 48 abutting the plate 32. This housing 47 provides a fixed seat for a pair of roller bearings 49 which in turn rotatably support a reduced portion 50 of the shaft 46. The rotatable shaft 46 has a ratio varying pulley 51 mounted on a ribbed section 52 of the reduced portion 50 whereby to render the pulley 51 rotatable with the shaft 46. That face of the pulley 51 adjacent the plate 32 is formed to provide a seat 53 with sufficient clearance to rotate freely about the open end of the housing 47 which is sealed by a resilient gasket 54. The extreme end of the reduced portion 50 is further reduced and is threaded and extends through an opening in the end wall of the housing 47 to receive a lock nut 55 to secure the shaft 46 on the roller bearing housing 47 for rotation relative thereto.

The shaft 46 is received by the hub portion 56 of the reel 24 and has a locking lever 57 at its free end whereby to key and lock the reel 24 to the shaft 46 for rotation therewith in a manner well known in the art. As seen in Figs. 2 and 4 the pulley 51 is interconnected by a belt 58 to a drive pulley 59 which in turn is drivingly connected to a source of movement (not shown) forming a part of conventional projector drive mechanism.

A modified form of supporting bracket is shown in Figs. 9 and 10 wherein a swinging plate 32' is provided and carries the shaft 46 through the medium of a housing identical to the one hereinbefore explained. The plate 32' is hingedly connected to a mounting plate 29' by a conventional hinge 61 to mount the plate for rotation into the confines of the cover portion 13. The plate 32' has a swivel bolt 62 carried thereby and adapted to threadably engage a boss formation 63 seated in the side wall 27' of the cover 13 so that the threaded stud 64 of the bolt 62 may be screwed fast upon the side wall 27' to hold the swinging plate 32' in extended position.

With my improved arrangement of portable equipment there is provided a means whereby to

quickly set up a projector for use with little loss of time. Upon opening the case 10 in the manner hereinbefore explained with the cover portion secured to the top wall 15 by the stabilizer means 19, the reel supporting brackets 28 are found in the condition shown at the right in Fig. 4 with the bolt 40 bearing against the periphery of the keeper block 35 by action of the tension spring 42. As seen in Figs. 6, 7 and 8 the wall 27 is cut away as at 60 adjacent the keeper block to permit its rotative movement with the plate 32 as hereinbefore explained. The person setting up the projector need only swing each of the shafts 46 outwardly until the plate 32 engages the front face of the wall 27 whereupon the bolt 40 will automatically extend into latching engagement with the keeper lug 39 by action of the spring 42. The belts 58 are then stretched over their respective train of pulleys and the reels 24 taken from their storage place and mounted on their respective shaft 46, the locking levers 57 of which are quickly flipped into locking position and the film now fed from the feed roller through the circuit of movement over the sprockets 26 and back up for attachment to the take-up reel 24'. The projector thus set up provides a solid and substantial operating unit which is free from undue vibrations and in which the high-speed gyrations of the reels 24 have a firm foundation with the base portion 12 of the case 10.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modification as come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. A film reel supporting bracket for supporting a high-speed shaft in a portable case and comprising a mobile shaft-bearing plate swingably mounted adjacent an edge of one wall of the portable case, trunnion means on said wall adjacent the edge thereof, boss formations on said mobile shaft-bearing plate, a pintle hingedly securing said boss means in said trunnion means, and means for automatically latching said mobile shaft-bearing plate in engagement with the edge of said wall to maintain said mobile shaft-bearing plate in extended condition, said last named means being adapted to be manually released to permit said mobile shaft-bearing plate to be retracted within the confines of said portable case.

2. A film reel supporting bracket for supporting a high-speed shaft in a portable case and comprising a mobile shaft-bearing plate swingably mounted adjacent an edge of one wall of the portable case, trunnion means on said wall adjacent the edge thereof, boss formations on said mobile shaft-bearing plate, a pintle hingedly securing said boss means in said trunnion means, and means for automatically latching said mobile shaft-bearing plate in engagement with the edge of said wall to maintain said mobile shaft-bearing plate in extended condition, said last named means comprising a keeper block operatively associated with said mobile shaft-bearing plate and said pintle, and a movable bolt releasably urged toward said keeper block for latching engagement therewith when said mobile shaft-bearing plate is pressed against the aforementioned edge of said wall of the case.

3. In a folding bracket normally adapted to repose within the confines of a container and adapted to be moved into an extended condition relative to said container, the combination of trunnion means on a wall of said container at the point of convergence of the inner face thereof with an open front edge thereof, a movable plate on said trunnion means, and means for automatically latching said movable plate in engagement with the aforementioned open front edge.

4. In a folding bracket normally adapted to repose within the confines of a container and adapted to be moved into an extended condition relative to said container, the combination of trunnion means on a wall of said container at the point of convergence of the inner face thereof with an open front edge thereof, a movable plate on said trunnion means, means for automatically latching said movable plate in engagement with the aforementioned open front edge, said latch means comprising a keeper means unitarily formed as a part of said movable plate for movement therewith, a latch bolt mounted on said wall of said container for movement toward and away from said keeper means, and spring means for normally urging said latch bolt toward said keeper means for the purpose aforesaid.

5. In a retractible bracket for portable machinery and adapted to be confined within a folding case and swingable into an extended condition to support a high-speed shaft for operative association with said portable machinery, the combination of trunnion means on one wall of said case adjacent an open edge thereof, a shaft-supporting member, a keeper block operatively associated with said member, a pintle joining said member and said keeper block into a common mobile element and for mounting the latter in said trunnion means for rotative movement relative to said case, bolt means movably mounted on said case for movement toward and away from said keeper block, and means for urging the bolt means toward said keeper means whereby to automatically latch said shaft-supporting member when the latter is rotated into engagement with the open edge of said one wall of said case.

6. In a retractible bracket for a portable housing and including a mounting plate secured to an inner face of one wall of said housing, trunnion means formed on said mounting plate adjacent the edge of said wall, a movable plate having boss formations thereon arranged between said trunnion means, a keeper element arranged between said boss formations, said trunnion means, boss formations and keeper element having aligned pintle-receiving passages to dispose a pintle with its peripheral face in tangential relation with said edge of said wall to dispose said movable plate at right angle with respect to said mounting plate when the movable plate is in engagement with said edge of said wall, a pintle extending through said trunnion means and having a press-fit relative to said movable plate and said keeper element for joint movement on said trunnion means, and a latch bolt mounted on said mounting plate and releasably urged toward said keeper element whereby to automatically latch said movable plate in extended condition when the latter is in engagement with said edge of said wall.

7. In a portable machine having a base portion including a drive means and a cover for the base portion and hingedly mounted thereon for

swinging movement into superposed relation with respect thereto, the combination of a support for reel means employed in the operation of the machine and comprising a mounting plate secured to a vertical wall of the cover, a shaft bearing member hingedly mounted on said mounting plate and means for securing said shaft bearing member in extended condition, a rotatable shaft extending laterally from said shaft bearing member and adapted to be drivingly connected to the drive means in the base portion.

8. In a portable motion picture projecting machine having a base portion containing a driving means and a cover portion hingedly mounted on the base portion and swingable into superimposed relation with respect to the base portion and including vertical side walls, the combination of means for detachably connecting the cover portion to the base portion when the cover portion is superimposed on the base portion, film reel supporting brackets on the vertical side walls of the cover portion and each including a rotatable shaft and a movable support for said shaft movable to a position to dispose the shafts in substantial parallel relation with respect to each other in a horizontal plane, a driven element carried by each of said shafts, means connecting one of said driven elements with the driving means when said shafts are in said parallel relation with respect to each other, and means for releasably holding said movable support of each of said film reel supporting brackets in a position to support said shafts in said parallel relation with respect to each other.

9. In a portable motion picture projecting machine having a base portion containing a driving means and a cover portion hingedly mounted on the base portion and swingable into superimposed relation with respect to the base portion and including vertical side walls, the combination of means for detachably connecting the cover portion to the base portion when the cover portion is superimposed on the base portion, film reel supporting brackets on the vertical side walls of the cover portion and each including a rotatable shaft and a movable support for said shaft movable to a position to dispose the shafts in substantial parallel relation with respect to each other in a horizontal plane, a driven element carried by each of said shafts, means connecting one of said driven elements with the driving means when said shafts are in said parallel relation with respect to each other, and means for automatically latching said movable support of each of said film reel supporting brackets in a position to support said shafts in said parallel relation with respect to each other.

WILLIAM C. DE VRY.