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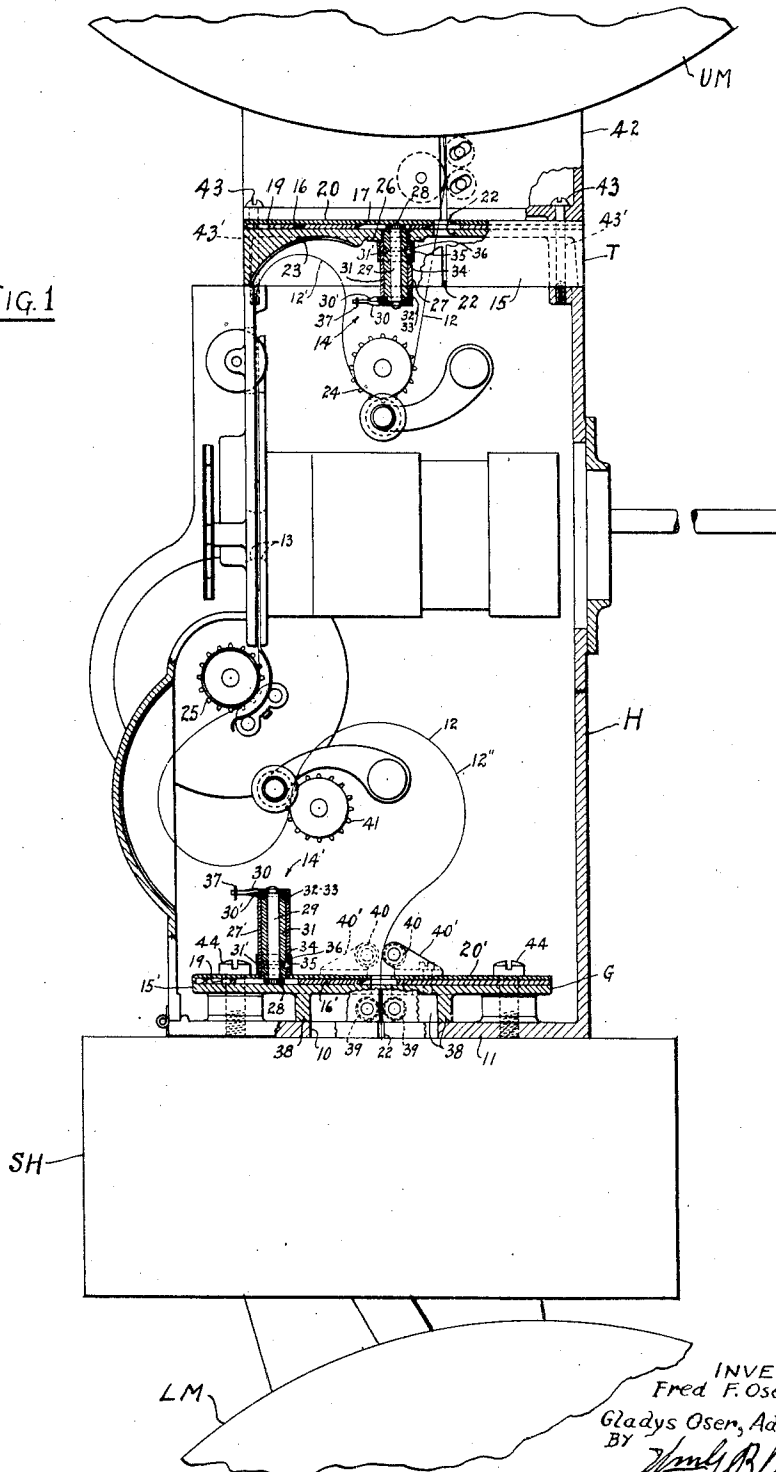
F. F. OSER

2,092,468

FIREGUARD

Original Filed April 20, 1933 3 Sheets-Sheet 1

FIG. 1



INVENTOR
Fred F. Oser, Deceased
Gladys Oser, Administratrix
BY *Wm. Blomstraw*
HIS ATTORNEY

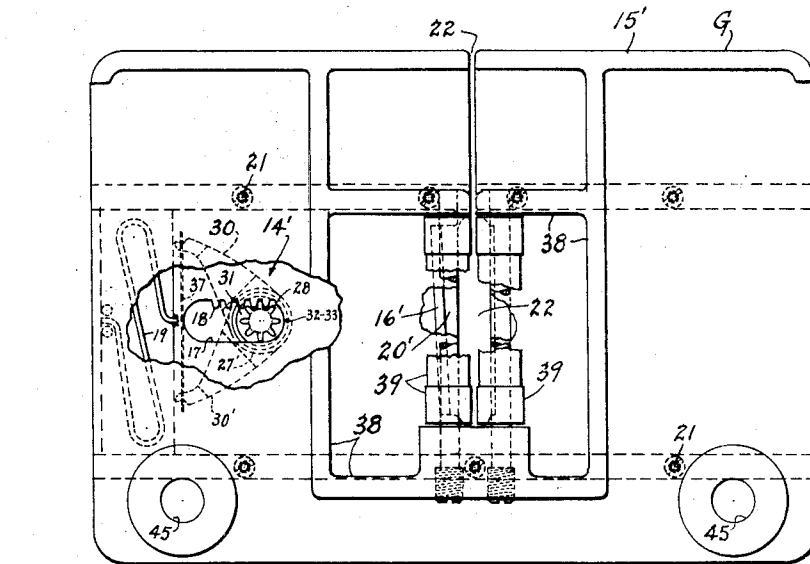
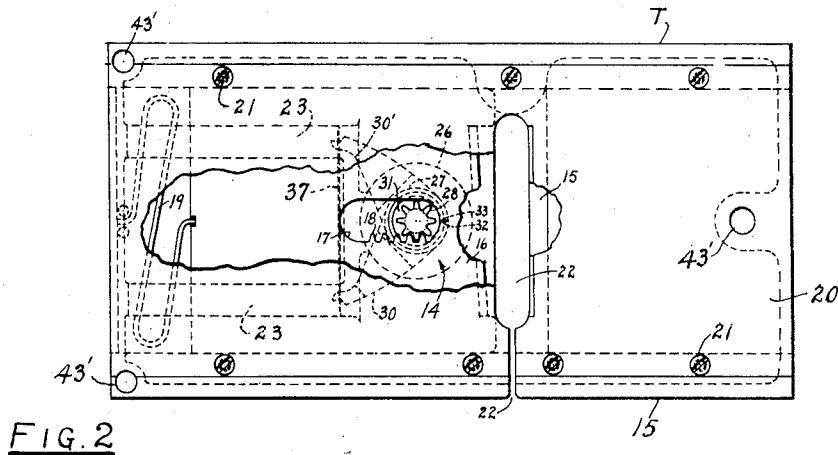
Sept. 7, 1937.

F. F. OSER

2,092,468

FIREGUARD

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INVENTOR
Fred F. Oser, Deceased
Gladys Oser, Administratrix
By *Amly Blomstran*
HIS ATTORNEY

Sept. 7, 1937.

F. F. OSER

2,092,468

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Original Filed April 20, 1933 3 Sheets-Sheet 3

FIG. 4

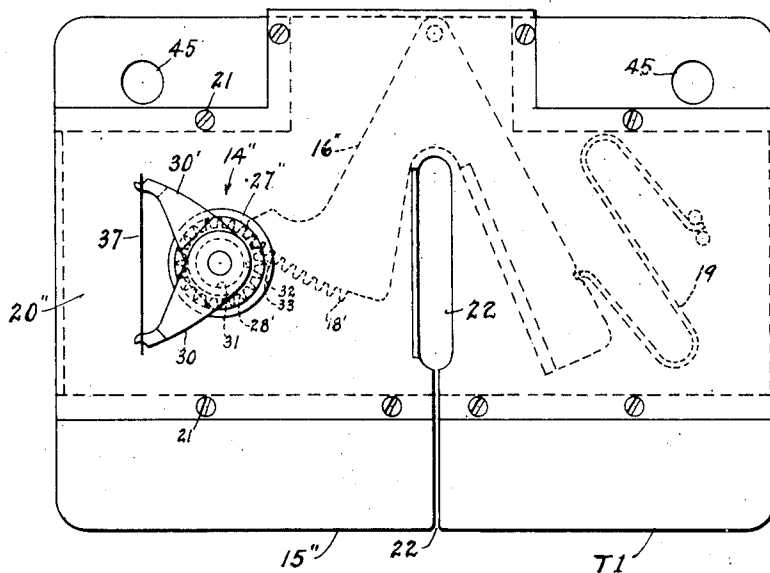
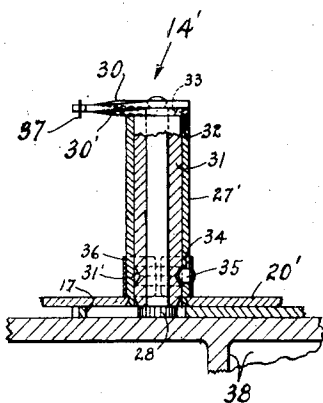


FIG. 5



INVENTOR
Fred F. Oser, Deceased
Gladys Oser, Administratrix
By *Wm. L. Blomstraw*
HIS ATTORNEY.

UNITED STATES PATENT OFFICE

2,092,468

FIREGUARD

Fred F. Oser, deceased, late of Chicago, Ill., by
Gladys Oser, administratrix, Chicago, Ill.

Application April 20, 1933, Serial No. 667,058
Renewed August 3, 1937

10 Claims. (Cl. 88—17)

This invention relates in general to fire guards or fire traps as used in connection with motion picture projecting machines, but more particularly it has reference to improvements in fire guards or fire traps which automatically operate to effectually confine the flames from burning film in a projecting machine head or mechanism housing within such head, and to prevent any burning film from leaving the interior of such head or housing, or of the film burning beyond the fire traps containing the improvements contemplated in my invention.

An important object of the invention contemplates the installation of the guard or trap directly attached to a projecting machine head or mechanism housing at its top and onto the bottom of such head or housing within the walls thereof.

Another important object of the invention contemplates the provision of a fire guard or trap which may be readily detachably secured, in the manner above mentioned, to any of the standard makes of projecting machine heads.

Another important object of the invention contemplates the provision of a fire guard or trap which may be readily detachably secured, in the manner above mentioned, to any of the standard makes of projecting machine heads without in the least interfering with the installation of sound producing mechanism, or the installing or removing of film magazines.

A further important object of the invention contemplates mechanism for automatically closing off the film openings or slots in the top and bottom of a motion picture projecting machine head or mechanism housing and simultaneously preventing any further progress of the film in either direction through said openings should the film be fired at the projection aperture of such projecting machine, and to prevent any flames from the burning film from going beyond said openings, or of leaving the interior of the housing as above stated.

The invention further contemplates a film opening or slot in the fire guard or trap and a spring actuated shutter or gate therefor, and a fire wall suitably arranged around said opening intermediate the said gate and the seat to which the fire guard may be attached whereby flames from the burning film are effectually prevented from igniting the film beyond the gate above or below the device, or from escaping through the film opening or slot in the bottom of a motion picture machine head or housing and into the head containing sound producing mechanism, or into the film magazines.

The invention further provides a pair of parallel guide rollers or guide chutes suitably arranged on either side of the film opening or slot as provided through the fire guard or trap and intermediate the fire walls disposed, as stated, around said film opening.

The invention further provides adjustable means, as a guide roller or guide chute, for guiding the film coming from the film feeding or operating mechanism in the mechanism housing or head of a motion picture projecting machine centrally through the film opening or slot as arranged in the fire guard or trap wherein are embodied the improvements contemplated in my invention.

The invention further contemplates a smooth arcuate surface which provides ample clearance and a guide for forming the film loop intermediate the continuously running film feed sprocket and the intermittent feed sprocket or film operating mechanism of a motion picture projecting machine.

The invention further contemplates automatic mechanism for closing off the film opening or slot provided in the fire guard or trap of my invention and simultaneously severing the film in such guard or trap as arranged at the upper and lower parts of a motion picture projecting machine head or mechanism housing should the film become ignited at the projection aperture of such projecting machine.

A further important object of the invention contemplates the provision of a detachable or removably secured automatically releasable locking device for locking the above mentioned closing off mechanism in position to operate to close off the film opening or slot provided in the fire guard or trap of my invention and of severing the film extending through the said slot and the film opening or slot of a motion picture projecting machine head or mechanism housing. The said device or locking mechanism also contemplates the provision of means whereby to attach a highly flammable or fusible link which provides a means to hold the said device or locking mechanism from operating to release the said closing off and severing mechanism only in case the film should become fired or ignited at the projection aperture of the projecting machine in which such mechanism may be installed. The said device or locking mechanism is adapted to be manually operated to arrange the said closing off mechanism to its normal locked position clear of the film opening in the said trap.

The invention further contemplates a neat, serviceable device of the character described

which may be readily installed or attached to any standard make of motion picture projecting machine head or mechanism housing without, in the least, having to make any changes or alterations in such machine head or housing, and, as before stated, without interfering with the attaching or removal of film magazines, or the installation of sound producing mechanism.

These and other objects of the invention will be better understood by referring to the several illustrations in the accompanying drawings, and more fully described in the following specification, and more particularly pointed out in the appended claims.

In the several illustrations,

Figure 1 is a side elevation of a motion picture machine head or mechanism housing with its side door and walls being broken away to show more clearly the film operating mechanism and the manner of installation of the fire guard or trap embodying the improvements of my invention as installed or attached relative to the mechanism and housing of such motion picture machine. Certain portions of the device and its housing are shown in section to more clearly show the relative position of its several parts;

Figure 2 is an enlarged top plan view of one form of the invention which may readily form the top wall of the mechanism housing of a projecting machine;

Figure 3 is an enlarged plan view of the underside of the invention which may be readily installed or attached to the bottom wall on the inside of the mechanism housing as is shown in Figure 1;

Figure 4 is a top plan view of the invention employing a rotatory or swingable shutter instead of a longitudinally movable shutter as employed in the devices shown in Figures 1, 2, and 3; and,

Figure 5 is an enlarged sectional view of a detachable shutter locking and operating mechanism embodying my invention, showing more clearly the method of removably securing the same in co-operative relation to the fire shutter or film cutting blade.

In the accompanying drawings similar characters refer to similar parts throughout the several views.

The invention consists essentially of a fire guard or trap removably mounted in the upper and lower parts of a motion picture projecting machine head or film operating mechanism housing designated by the reference character H. The guard or trap T, being mounted in the upper part of said housing H, is adapted to form the top wall of said housing, and the guard or trap, designated by the reference character G, being mounted on the bottom of the head H, and within the walls thereof, is adapted to form a fire guard over a film opening or passageway 10, provided in the bottom 11 of the said head.

Should the film 12 catch fire at the projection aperture 13, the flames therefrom will, substantially, instantly destroy a fusible or flammable link of a link locked fire shutter device 14, causing it to be released from its shutter locking position whereby, the shutter, being adapted to automatically operate to sever the film and to close off any means of outlet by which flames could escape from within the said housing in the upper and lower parts of the head, or of the burning film being operated beyond the said fire shutter or fire trap, or from within the said housing H, prevents, effectually, any danger of the film being burned or ignited in either the re-

spective upper or lower magazines, UM and LM, or of there being any danger of the mechanism of an installed sound producing head, designated by the reference characters SH, being destroyed by fire from burning film being confined within the said housing walls.

The devices T, and G, shown, respectively, in Figures 1, 2, and 3, and guard or trap T1, shown in Figure 4, comprises a rectangular shaped body portion 15, 15', and 15'', respectively, in each of which is mounted, respectively, a spring actuated shutter plate or fire guard 16, 16', and 16'', which is a swingable shutter, which, when operated, is adapted to sever film and close off an opening 22, in the several devices through which film is being operated, at the moment the film may be set afire at the projection aperture, as before stated.

In the plates 16, and 16', is formed a suitable longitudinal slot 17, having gear teeth 18, formed along one of its longitudinal sides. Suitably located in the body portion 15, 15', and 15'', is a shutter plate actuating compound bent spring 19, the same being adapted to instantly operate the said plate across the said opening to close the same and simultaneously sever the film should the same be set afire. Fastened to the body 15, 15', or 15'', as by means of screws 21, is respectively, a cover plate 20, 20', and 20'', which is adapted to hold said shutter plate, and said spring 19, in place and in operative relation to each other.

In each of the several devices T, G, and T1, a film opening or passageway 22, is formed inwardly from one of the lateral sides of the said body portions, and the cover plates. And in the body portion 15, and on the underside thereof, of the upper trap T, is formed a smooth arcuate surface 23, which is adapted to accommodate a film loop 12', formed in the film between the continuous film operating sprocket 24, and the intermittent film feeding sprocket 25. And on the underside of the body portion 15, of upper trap T, is formed a downwardly extending boss 26, into which is fastened, as by riveting, a shouldered tube 27, into which is inserted a fusible or flammable link locked fire shutter locking and operating device designated, generally, by the reference character 14. A device 14', and 14'' similar in construction to that of device 14, is, comparatively, longer than that shown mounted in trap T, and is fastened, in a like manner, to cover plate 20', of trap G, and 20'', of trap T1, instead.

The devices 14, 14' and 14'', comprise a pinion gear 28, and 28', for device 14'', formed concentrically on one end of a shaft or rod 29. To the shaft on the end opposite the pinion is rigidly fastened a fusible or flammable link attachment arm 30. Over said rod 29, and between pinion 28, or 28', and arm 30, is workably fitted an annularly grooved sleeve bearing 31, to which is rigidly fastened, at the end adjacent arm 30, a similar arm 30', thus forming unit devices 14, 14', or 14'', as the case may be, which may be removably secured into tube 27, which accommodates device 14, or into tube 27', which is adapted to accommodate device 14', or into tube 27'', which is adapted to accommodate device 14''. The arm 30' being suitably located angularly, about 45°, from a vertical plane extending through the axis of the device, 14, 14' or 14'', and coincident with a vertical plane extending longitudinally central through traps T, G, and T1, by a locating pin or key 32, being fastened in, preferably, the tubes 27, 27', and 27'', and

extending up from the end of the tubes whereby the same will engage a corresponding size opening 33, formed in arm 30', on inserting unit 14, 14', or 14'' in their respective tubes 27, 27' or 27''.

5 Tubes 27', and 27'', being similar to tube 27, may be, in like manner, fastened, as before stated, to cover plate 20', or 20'', instead. Through the wall of tubes 27, and 27' is located an opening 34, to correspond to the location

10 of a groove 31', formed annularly around sleeve bearing 31, as is shown in Figures 1 and 5. Through opening 34 extends a round-ended spring actuated latch pin 35, which is fastened to, preferably, a flat wire spring 36, being coiled

15 around the tubes 27, and 27', as is shown in Figures 1 and 5. Pin 35 extends sufficiently through opening 34, whereby it will engage groove 31', and hold unit 14 or 14', in place and from accidentally coming out on the same being properly inserted through their respective tubes. Tubes 27, 27', or 27'', being properly located with respect to rack teeth 18, or, 18', pinion gear 28, or 28', as the case may be, will engage its respective rack 18, or 18', on the units being

25 inserted through their respective tubes. By virtue of arm 30, being rigidly fastened to pinion shaft 29, and pinion 28, being in proper engagement with rack 18, any turning of arm 30, and likewise for unit 14'', will operate its respective shutter plate 16, 16', or 16'', from its closed position across film opening 22, to its normal releasably locked operative position clear of said opening 22. The plate 16, 16', or 16'', on being operated to its said locked position by arm 30, automatically locates arm 30, to an angle of about

30 90°, from arm 30', whence, a fusible or flammable link 37, is connected or attached to the end of each of the arms 30, and 30', locking the unit together with its respective shutter plate in their normal releasably locked operative position in their respective traps T, G, and T1. The unit and shutter being in position in its respective trap in the housing of a motion picture projecting machine, and should the film, as before

40 stated, catch afire at the projection aperture, the flames or heat from the burning film will instantly destroy the said link connection and therefore release arm 30, from holding pinion 28, or 28', in locked engagement with rack 18, or 18', whence the shutter plate will instantly and automatically operate to close off opening 22, and simultaneously sever the film thereat, due to the action of spring 19.

Referring to Figures 1, 3, and 5, it will be seen

55 that trap G, is provided with a fire wall 38, extending downward from the underside of body portion 15', and surrounding film opening 22, and also opening 10, formed in the bottom 11. The wall extends down sufficiently to be in contact with the top surface 11', of bottom 11. Intermediate wall 38, and centrally parallel to opening 22, a pair of parallel guide rollers or guides 39, are installed whereby to guide the film centrally through the film opening so that

60 there will be no danger of the film being marred or scratched while passing through the said opening. And, to further prevent the film from coming into contact with the sides of said opening, a parallel guide roller or guide 40, is provided and adjustably mounted, in a bracket 40', which is fastened to cover plate 20', on either side of and parallel to the said opening 22, whereby to accommodate the film coming from the lower film operating sprocket 41, and direct or

75 guide the film centrally through said opening.

When sound producing mechanism is employed in connection with motion picture projecting machines, it is customary to install such mechanism below the projecting machine intermediate the projecting mechanism housing and film take-up magazine LM. In such cases, it becomes necessary that the film, between the said sprocket 41, and the sound producing mechanism be more or less loose in the form of a loop 12'', therefore, to provide against the film vibrating against the sides of said opening 22, previous to its entering the sound producing mechanism, it becomes necessary to provide such film guiding mechanism as guide rollers 39, and 40, which, however, may be replaced by suitable smooth

15 surfaced guide chutes.

In order to install upper trap T, and provide a top wall for the housing H, it will be only necessary to remove the upper film magazine well 42, by removing its fastening screws 43, and replace it with trap T, then replace well 42, over trap T, and refasten both together by longer screws 43, inserted through openings 43' in trap T. And, in order to install lower trap G, or T1, it will be only necessary to remove film operating mechanism

25 bracket fastening screws 44, place said trap G, or T1, properly upon the floor of housing H, and fasten it down by means of fastening screws 44, inserted through openings 45, provided in traps G, or T1.

Should any breakage or damage occur to either of the said traps, it will only be necessary to remove the respective screws and the damaged trap and replace it with a perfect one, in the manner above stated, while the damaged one is being

35 repaired.

Having thus described the invention, it can be readily understood that the minor details of its construction may be altered in several ways without departing from the spirit and scope of the invention, and without losing any of its attendant advantages. Therefore, what is claimed and desired to be secured by Letters Patent is:—

1. The combination in a device of the character described, comprising a removable fire guard

45 shutter plate locking and operating device, a fixed shouldered tube in which to mount said operating device, a mounting frame in which to rigidly secure said tube, of a pinion gear formed on one end of a shaft, a fusible or flammable link engagement arm rigidly secured to the end of said shaft opposite said gear, a sleeve bearing workably secured over said shaft between the said gear and the said arm and having a similar link engagement arm rigidly secured thereon adjacent

55 the arm on said shaft, an annular groove suitably formed around the said sleeve, the said plate locking and operating device being adapted to be removably secured in said tube, a spring actuated latch suitably located around said tube and adapted to releasably engage said groove, an opening through which said latch may operate being provided in said tube and arranged in correlation to said groove, and a locating pin suitably located to prevent said sleeve from turning around

65 and maintain the arm secured thereon in a desired angular position, substantially as and for the purpose specified.

2. A device of the character described, having a rectangular shaped body portion, the same having a transverse opening arranged therethrough providing a film passage-way, a spring-actuated shutter for closing the said passage and for severing film passing therethrough slideably arranged in said body portion, a readily removable flam-

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5 mable or fusible link carrying and shutter operating mechanism, being provided with link engaging members, the said mechanism being detachably secured in a tube being fastened in said body, a flammable or fusible link attached to said members, the said link being adapted to releasably hold said mechanism from being operated by the said shutter while the same is in its retracted normal position clear of said passage, a compound bent spring adapted to operate said shutter, a portion of said mechanism having a gear-toothed member being adapted to operate said shutter to its normal retracted position clear of said opening, the said member being adapted to maintain said link carrying mechanism in operative engagement with said link, a smooth arcuate surface formed on the underside of the said body portion, and the said device or fire trap being adapted to be secured in the upper part of a motion picture projecting machine head or film operating mechanism housing and form a combined fire guard and a top therefor, substantially as shown and for the purpose specified.

3. In a device of the character described, a rectangular shaped body portion having a transverse opening arranged therethrough providing a film passage-way, an automatically operated shutter for closing the said passage and for severing film passing therethrough slideably mounted in said body, a readily removable flammable or fusible link carrying and shutter operating mechanism, a pinion gear forming a portion of said mechanism being adapted to engage and automatically operate and hold said shutter from its closed to normal position clear of said opening, the said mechanism being detachably secured in a tube being fastened in said body, and the said device being adapted to form a combined fire guard or fire trap and a top for a motion picture film operating mechanism housing.

4. In a device of the character described, a rectangular shaped body portion having a transverse opening arranged therethrough providing a film passage-way, an automatically operated shutter for closing the said passage and for severing film passing through said opening, a tube in which to detachably secure a shutter operating mechanism, the said tube being fastened in a plate being attached to said body, a readily removable flammable or fusible link carrying and fire shutter operating mechanism having a pinion gear member forming a portion thereof, the said mechanism being detachably secured in said tube, link engaging members included with said mechanism, a flammable or fusible link connecting said members, the said pinion member being adapted to engage said shutter and operate the same from its closed to normal open position and to maintain said link carrying mechanism in operative engagement with said link, a fire wall or guard extending down from the underside of said body portion and surrounding the said opening, a pair of parallel guide rollers or film guides disposed on each side of said opening intermediate the said wall, and a guide roller or film guide adjustably mounted on the top of said body parallel to said opening, the said guide roller being adapted to be arranged on either side of the said opening.

5. In a device of the character described, a rectangular shaped body portion having a transverse opening arranged therethrough providing a film passage-way, a spring-actuated shutter for closing said opening and for severing the film passing therethrough, a detachably secured and

readily removable flammable or fusible link carrying mechanism having a pinion gear forming a portion thereof, a tube in which to removably attach said mechanism, the same being fastened in a plate being attached to said body, and the said mechanism being adapted to engage and automatically operate and hold said shutter from its closed to normal position clear of said opening.

6. In a device of the character described, a rectangular shaped body portion having a transverse opening or slot arranged therein providing a film passage-way, a longitudinally operable shutter or fire trap for closing said slot and for severing film passing therethrough, a detachably secured and readily removable fusible or flammable link carrying mechanism, a said mechanism mounting tube being fastened in said body portion, a pinion gear forming a portion of said mechanism adapted to automatically engage said shutter and hold the same in its normal open position from said slot, and a double acting spring adapted to automatically operate said mechanism to operative engagement with a flammable or fusible link and to operate said shutter to its film severing and closed position across the said opening.

7. In combination with a motion picture projecting machine housing enclosing the usual film operating mechanism, a detachable fire guard or trap, of the character described, including an automatically operated combined fire shutter and film cutter operating mechanism, the said trap being adapted to be mounted in the upper part of a motion picture projecting machine head or film operating mechanism housing and form a top therefor, and a similar detachable fire guard or trap having a similar mechanism, the same being adapted to be mounted on the floor or bottom of said housing within the walls thereof, the said trap providing a readily detachable fire shutter and film cutter actuating mechanism having a shutter operating pinion gear forming a portion thereof, the said gear being operatively connected to a fusible or flammable link carrying mechanism, and a double acting spring for automatically operating the said mechanism.

8. In a fire guard or trap of the character described, a rectangular shaped body portion having a transverse film opening or passage-way extending in from one of its longitudinal parallel sides, a shutter plate being adapted to function as a film cutter across said opening, the same being suitably mounted in said body portion, a slot provided in said plate having opposite parallel sides and having a gear rack formed in one of the sides of said slot, and a readily detachable shutter plate and a flammable link carrying arm actuating mechanism having a pinion gear forming a portion thereof, the said gear being detachably engageable with the gear teeth of said rack.

9. In combination, a fire guard shutter plate mounting frame or housing, a fire guard shutter plate and film cutter having a slot with a gear rack formed therein, a readily detachable operating mechanism for actuating said plate, the said mechanism having a pinion gear formed thereon, the said gear being adapted to be removably engaged to said rack, a fusible or flammable link engagement arm rigidly connected to said gear, a removable sleeve bearing into which to workably secure said mechanism, a link engagement arm rigidly secured on said sleeve arranged to cooperate with the said other arm, an annular groove suitably formed around said sleeve, means comprising a spring actuated latch

adapted to automatically releasably engage said groove, and a fixed bearing comprising a shouldered tube in which to detachably mount said mechanism, the said means being mounted on said tube in co-operative relation to said groove, the said fixed bearing being rigidly secured in said housing.

10. In combination, a motion picture projecting machine film feeding mechanism head or housing inclosing usual film feeding and take-up mechanism therein, a fire guard or trap housing including a spring actuated fire shutter and a fire shutter operating and flammable or fusible link carrying mechanism being detachably secured as a unit to said trap housing, the said trap housing being adapted to provide a top or upper

wall to the said mechanism head, and a similar fire trap housing including a similar fire shutter and shutter operating and flammable or fusible link carrying mechanism being detachably secured as a unit to said trap housing and including a suitable arrangement of guide rollers, the said similar trap housing being adapted to be mounted upon the floor or bottom wall of said head, the said trap housings being readily detachably installed in their respective places without having to alter the said head in the least, substantially as described and for the purpose specified.

FRED F. OSER,
By GLADYS OSER,
Administratrix of Fred F. Oser, Deceased.