May 9, 1933. P. SWANSON 1,907,611

SWITCH STAND LOCK

Filed June 13, 1932 3 Sheets-Sheet 1

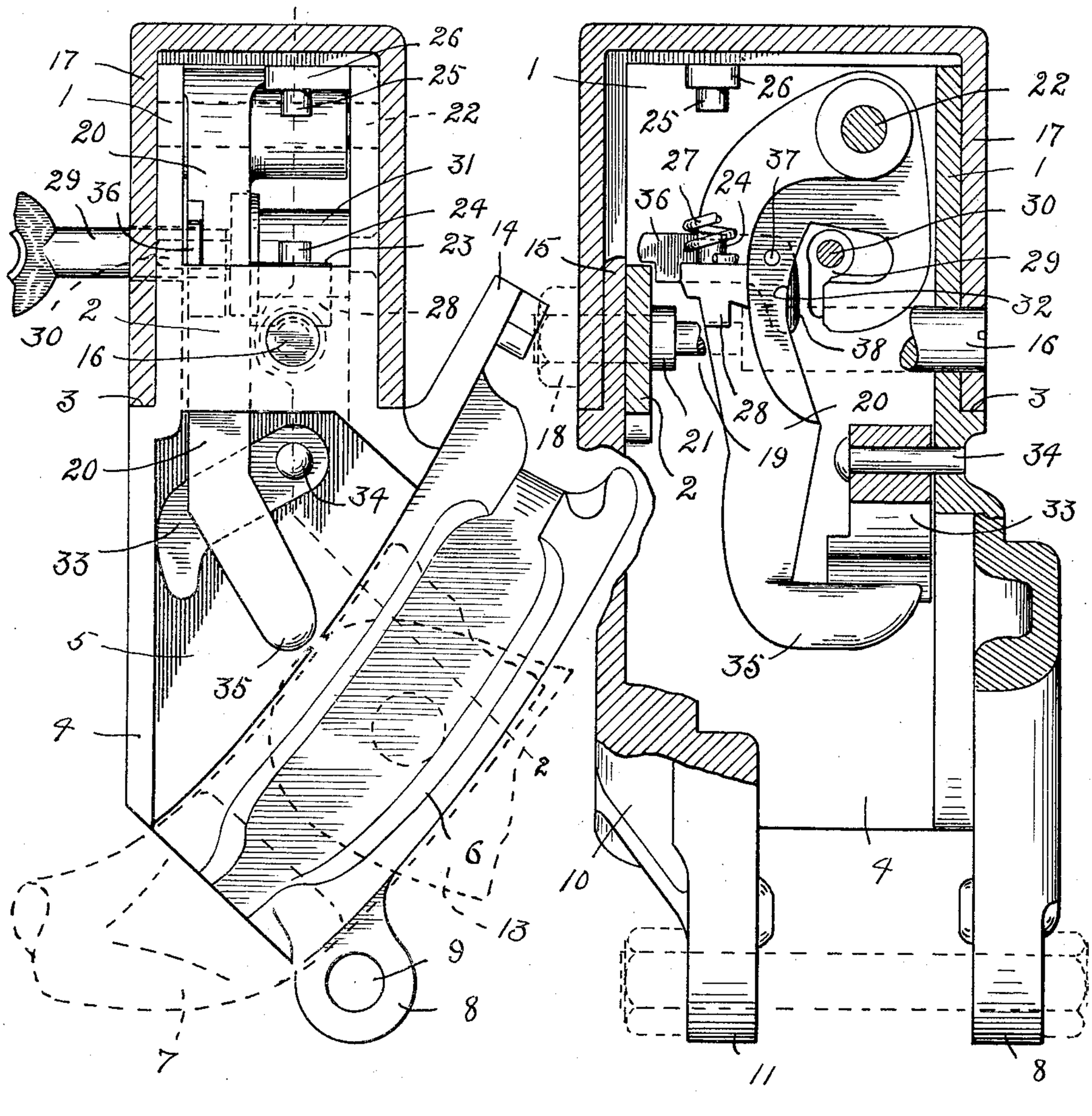

Fig. 1.

Fig. 2.

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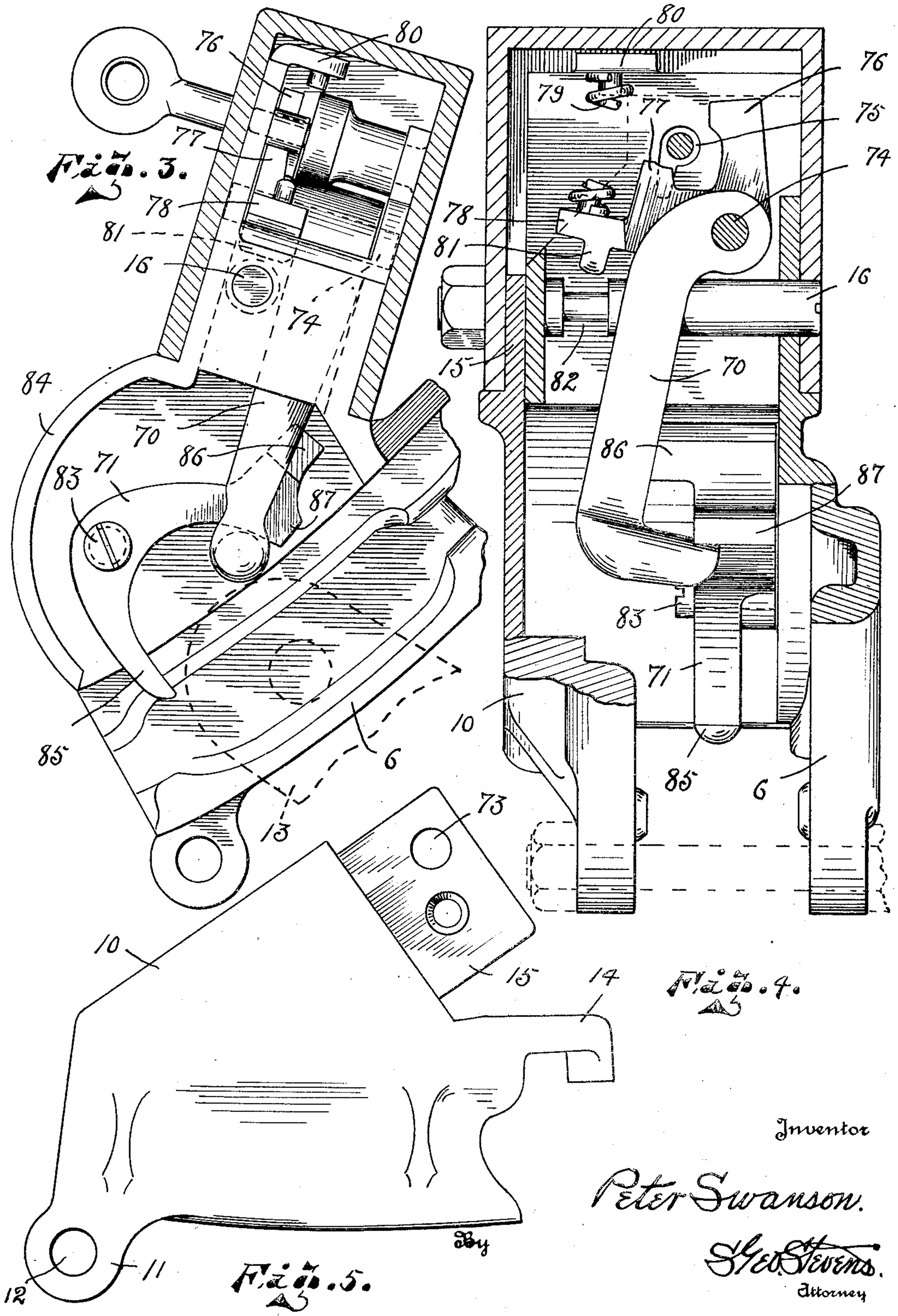

Fig. 3.

Fig. 4.

Fig. 5.

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Fig. 8.

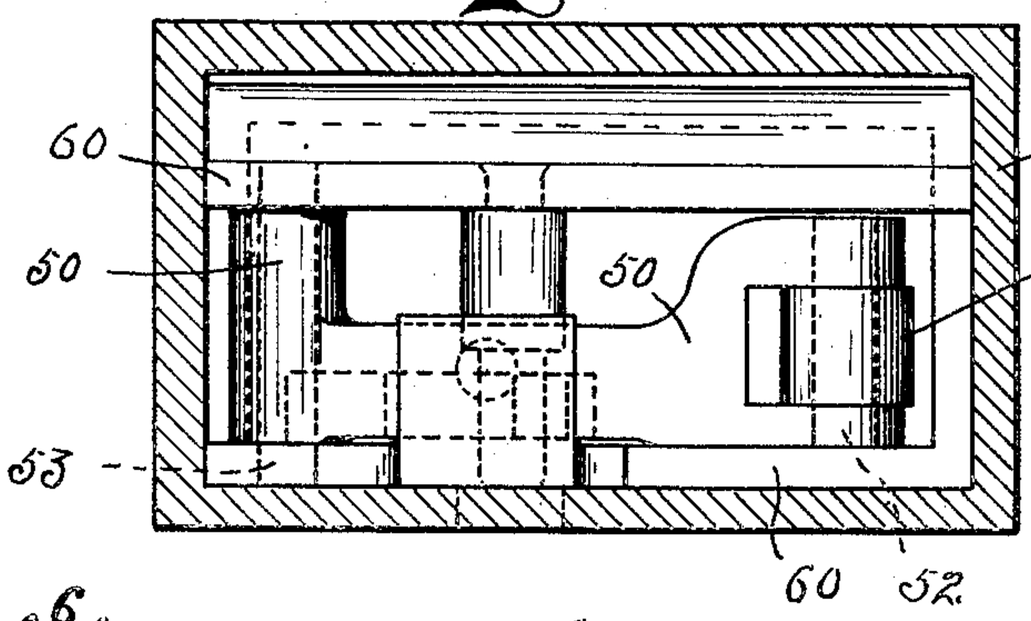


Fig. 7.

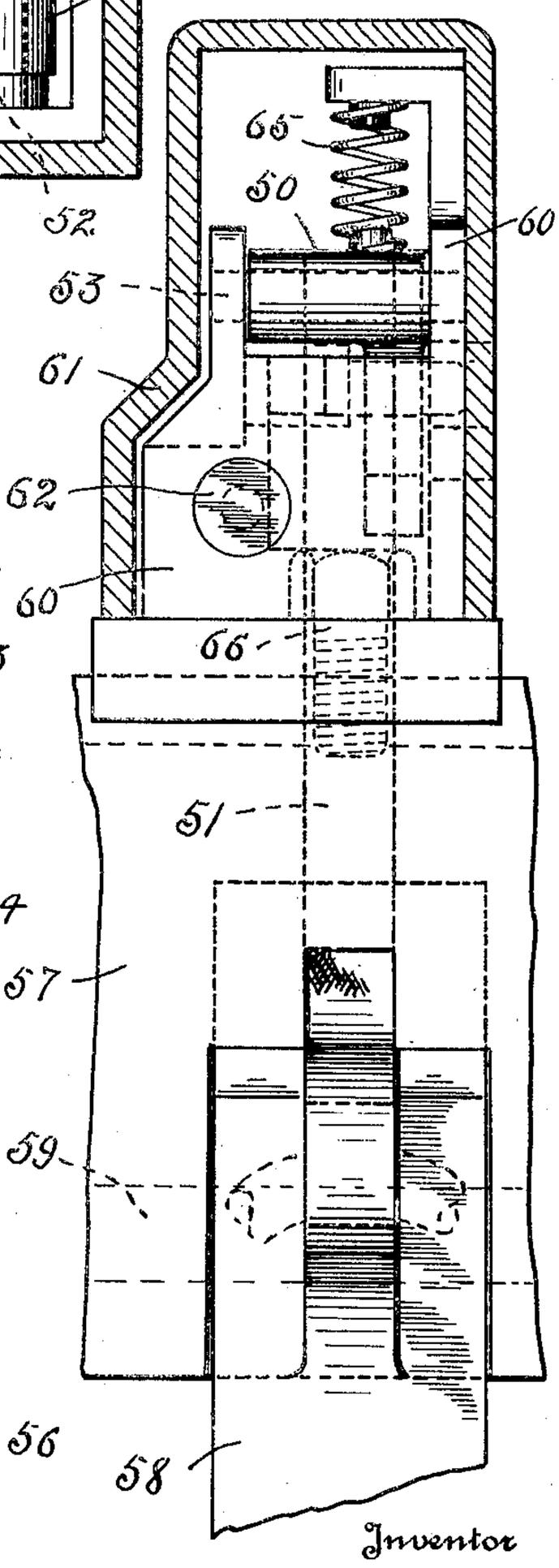
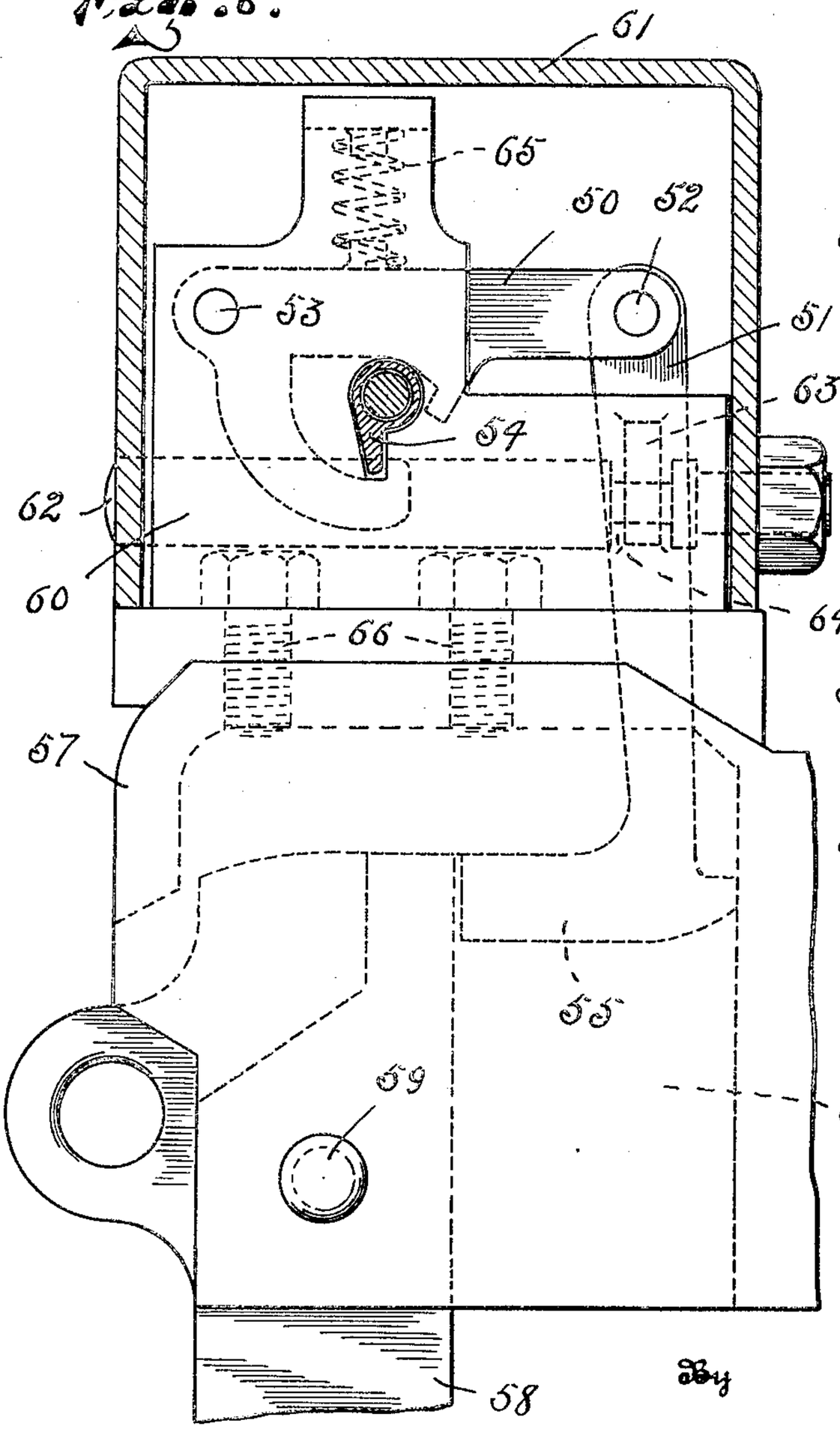


Fig. 6.



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UNITED STATES PATENT OFFICE

PETER SWANSON, OF ELY, MINNESOTA

SWITCH STAND LOCK

Application filed June 13, 1932. Serial No. 616,906.

This invention relates to railroad switch stand locks and is designed to be adaptable with comparatively slight modifications to two different types of switch stands, for example those illustrated one in my former patent, 1,835,442 of Dec. 8, 1931, and one in my former Patent 1,812,179, of June 30, 1931, in which latter the head of the switch stand is both rotatably and reciprocably movable when the switch is to be operated; that is to say the switch operating handle is pivotally mounted upon the head of the switch stand adjacent the lock.

The principal object of the instant invention is to further simplify the construction of such a lock and better adapt it to the various circumstances and requirements arising in the art; for example whereby it may be made as a lock readily applied to the handle of one type of switch stand, or to the head of the switch stand as preferred.

Other objects and advantages of the invention will appear in the following description thereof.

Referring now to the accompanying drawings, forming part of this application, and wherein like reference characters indicate like parts;

Fig. 1 is an elevation partly in section of one of the locks with one side of the clamping portion of the housing removed;

Fig. 2 is a broken section partly in elevation, taken on the line 2—2, Figure 1;

Fig. 3 is a view similar to Fig. 1 of a slightly modified form of lock and housing therefor;

Fig. 4 is a view similar to Fig. 2, though of Fig. 3;

Fig. 5 is a side elevation of the removable clamping portion of the housing;

Fig. 6 is a side elevation partly in section of a modified form of the lock as applied to a switch stand in which the switch lever is pivotally attached adjacent the lock;

Fig. 7 is a front elevation partly in section at right angles to Fig. 4; and

Figure 8 is a top plan view with the cover portion of the lock housing in section.

1 represents the main body portion of the lock housing which is rectangular in shape upon the top and bottom and preferably open upon the upper portion of one side, the lower portion of this side being indicated at 2, and the object of which will be described later. A ledge 3 is formed wholly about the base of the main body portion of the housing, while upon one side and face thereof there extend the walls 4 and 5, they being integral with each other. The wall 5 has a somewhat arcuately shaped extension, indicated at 6, hollowed out to fit one side of the switch stand handle which is indicated in dotted lines at 7, and is also provided with a downwardly extending lug 8 having a hole 9 therethrough for cooperative clamping engagement with the removable clamping side portion 10, shown in Figure 5, this latter also having a lug 11 with the hole 12 therethrough for such clamping engagement by means of the single bolt indicated in dotted lines, Fig. 4, so that when these two side portions are united about the handle, the lock housing will be securely held in proper position over the bifurcated portion of the handle through which the switch stand lug indicated in dotted lines at 13 protrudes when the handle is in locked position. It will be noted that both the clamping side portions 6 and 10 of the attachment are provided with hooked finger like projections 14 which are designed to assist in the firm engagement of the lock housing upon the switch handle. Furthermore the slide clamp 10 is provided with a filler or spacer projection 15 for lying against the narrow wall 2 of the housing body when in position thereupon and provided with a hole therein for registration with the house bolt 16. The cover part of the housing is illustrated at 17 and is open only upon the under side thereof for application to and upon the main body portion overlapping the projection 15 of the side clamp 10, it having previously been put into place supposedly upon the handle when installation takes place. Then the house bolt 16 is applied and held in position by a suitable nut 18.

The house bolt 16 is provided with a cut-out portion 19 registering with certain portions hereinafter described of the locking dog 20 and forming the limiting collar 21 with

respect to its extent of thrust into the assembly, and which thrust is designed to bring the blank head of the bolt 16 flush with the cap or covering member 17 of the housing as clearly shown in Figure 2 of the drawings, with only the nut 18 protruding upon the opposite side thereof, it being seen that the collar 21 impinges the inner face of the narrow wall 2 of the housing when the bolt is in position.

The gravity locking dog 20 is pivotally mounted upon the pin 22 journalled within the opposite walls of the inner portion 1 of the housing and is held therein only by installation of the cap 17 so that extremely easy means for disconnecting same is thus afforded. This locking dog is provided with a laterally extending arm or finger 23 carrying the pin 24 on the upper face thereof directly above which is a similar depending pin 25 fixed to the bent over portion 26 of one side wall of the housing 1, and intermediate of and about such pins is installed the expansive helical spring 27 for the purpose of biasing the locking dog 20 to its locking position and prevent tampering. A wedge like depending extension 28 is formed integral with the finger 23, and slightly arcuate upon the under side thereof to register within the cut-out space 19 of the housing bolt 16 when the locking dog is in locking position so that even when the nut 18 is removed from the protruding end of the house bolt the latter could not be removed until the locking dog had assumed unlocked position. Now such unlocked position of the dog 20 is accomplished as is obvious by the action of the key 29, as clearly shown in Figure 2 of the drawings. For such purpose the key is trust into the usual key hole provided on the front face of the assembled housing and onto the key pin 30 which protrudes from the cylinder like structure 31 extending from the back wall of the housing 1, and when turned engages the arcuately shaped edge of the locking dog, as at 32, and when the key is further turned it will swing the lower end of the dog out of locking position, and, if peradventure such movement of the locking dog has occurred prior to the entrance of the lug 13 into the lower portion of the lock housing, the dog 33 pivoted as at 34 will drop as by gravity down in front of the finger 35 of the locking dog and prevent removal of the key from the lock until the lug 13 or similar device is thrust into the lock to remove the latch 33 from such retarding position. Thus the lock is rendered absolutely safe against the removal of the key after once being unlocked without the element which is intended to be locked in such position being within the lock.

As a further means to insure against tampering of the lock, or in the event of by some means the spring 27 failing to function, I have provided the dog 36 pivoted as at 37 to the dog 20, with one arcuate end 38 thereof extending beyond the inner edge of the arcuate portion 32 of the locking dog so that the key will first engage the end, and tip up the opposite free end which is notched for engagement with the upper inner corner of the wall 2 where it has previously acted as a bar against unlocked movement of the locking dog 20, so that irrespective of the action of the spring 27, the locking dog 20 cannot be moved, thus providing an auxiliary safety feature of the lock.

From the above it is obvious that the paramount novelty of the instant structure is that of the locking dog, which directly engages the switch stand lug, being of unitary structure and directly operated by the key both to locked and unlocked position, and that the same is operable in no other manner normally except by the key.

Furthermore it is obvious that neither the locking dog nor its support has anything whatever to do with the assembly of the parts of the housing with the exception that it prevents the disassembly of such parts when in locked position, and that it cannot be unlocked normally without the key.

Thus I have provided a lock and housing therefor, the latter being applicable, when disassembled, to a common switch stand handle, and securely attached thereto by the house bolt and an auxiliary clamping bolt, which latter is the single bolt previously referred to, and one which cannot be removed from the handle without first unlocking the dog, removal of the house bolt, and subsequent removal of the key.

In the modification shown in Figures 6, 7, and 8, embodying the same principals of operation of the mechanism just described, the distinction is that the locking dog is composed of the two parts 50 and 51, pivotally united as at 52 with the portion 51 being pivoted as at 53 and directly operable by the key illustrated at 54, the gravitating feature of which dog is obviously augmented by the depending portion 51 provided with the horizontal head 55 operable within the chamber 56 of the switch stand head 57. This latter is of the type lastly spoken of in the preamble of the specification and which both rotates and vertically reciprocates with the throwing of the switch. The depending handle of this type, when the switch is locked, depends as at 58 and is pivotally mounted on the switch head as at 59. In this instance the inner portion of the lock housing is illustrated at 60 and the outer portion or cap at 61, and these two parts are held together as by the house bolt 62, similar in all respects to the house bolt 16 in the formerly described type, it being seen that the shank of the portion of the locking dog 51 carries a laterally projecting member 63, which, when the dog is in its depressed locked position, functions within the

cut out portion 64 of the bolt 62, similar to the action of the web 28 in the cut out portion 19 in the bolt 16 of the former structure. As a non-tampering element in this instance I provide the expansive helical spring 65 above the portion 50 of the locking dog to more forcibly bias same to locked position, and combat any effort at raising same without the proper key.

Furthermore it will be noted that the holding bolts of this lock are indicated at 66 and occur within the outer cover member 61, they being directly carried by the inner portion 60 and inaccessible until the cover member 61 is removed, such removal being impossible without a procedure identical with what was previously described in respect to the first mentioned embodiment of the invention.

In the modification shown in Figures 3 and 4 is illustrated a slightly different shaped locking dog 70, as well as a differently shaped cooperative latch 71, together with slight modification of the housing for the lock. It is thought that the housing arrangement for the lock is obvious in view of the description of same respecting Figures 1 and 2, and the removable clamping member shown in Figure 5 is identical in either case, except, for the modified lock, a hole 73 is provided for the bolt 16, it being in a slightly different position from that shown in Figures 1 and 2. In this structure the locking dog 70 is mounted upon the transverse shaft 74 occurring intermediate of the bolt 16 and the key hole 75 and the dog is provided above its pivotal support with an offset extension comprising the major and minor uprights 76 and 77 intermediate of which the key when inserted within the lock is designed to function in operating the dog and is provided also with the lateral extension 78 which carries a stub pin for the reception of the expansive helical spring 79, the opposite end of which spring is mounted upon a like stub on the bracket like extension 80 of the inner portion of the housing. The extension 78 is also provided with a depending portion 81 which is operable to and from the notch 82 in the bolt 16 in accordance with the position of the locking dog 70. That is to say when the locking dog is disengaged from the horn or lug 13 of the switch stand, as illustrated in Figure 4, the extension 81 is free from the notch 82 in the bolt 16 and the latter may then be removed. However it is obvious that this position of the dog cannot exist except as by the action of the key or the like.

Now the essential feature of this modified form is the provision of means for forcibly actuating the latch 71 by the action of the horn 13 of the switch stand in providing against the dog 70 assuming a locked position, and thereby permitting removal of the key from the lock when the switch is not closed. This is accomplished by the latch 71 being pivotally mounted on the pin 83 in the arcuate extension of the housing indicated at 84 and essential for such purpose although differing somewhat from the structures shown in Figures 1 and 2, and said latch being arcuate in shape to approximately fit the arcuate or rounded end of the switch stand horn. So that, assuming the lock to be in the position shown in Figures 3 and 4 and the lever forced down upon the horn, the latch will swing upwardly by engagement therewith freeing its upper notched end from engagement with the free end of the locking dog 70, and allowing the latch to drop as by gravity and also assisted by the spring 79 into locked engagement with the horn, simultaneously insuring the bolt 16 against removal and freeing the key.

It will be noted also that as the switch handle is raised, assuming the key to have actuated the locking dog for such purpose, that as the horn 13 leaves the lock it will automatically reverse the position of the latch by engagement with the lowermost finger 85 thereof, thus interposing the opposite notched end of the latch between the shank of the dog 70 and the wall of the housing, as well as also permitting the latch to ride on the finger of the dog, thus insuring its proper position for the subsequent reception of the horn. The lateral extension 86 of the latch is that portion which holds the dog away from the path of the horn while the arcuate extension 87 of the latch is the element which rides the finger of the dog to keep the latch in the proper position.

It will be obvious that when the latch is thrown upwardly by the horn, the extension 86 falls back of the dog out of the way of its advancement to locked position, when such is in order.

In this embodiment of the invention it is apparent that the positioning of the latch becomes a positive action free from any liability of failure to function, as for example by reason of snow, frost or ice.

By this arrangement, it will be noted that in the modified form the key operates in the opposite direction to unlock the dog to the direction in which it operates in the embodiment shown in Figures 1 and 2, thus making the invention adaptable to either right or left hand operation of the key.

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

1. A switch lock of the type described comprising a separable housing, a two-part pivotally united locking dog within the housing, a bolt for holding the parts of the housing in assembled position and means whereby one part of the dog prevents the removal of the bolt while the dog is in locked position.

2. A key controlled switch lock of the type described comprising a separable housing, a

bolt for holding the separable parts of the housing together, a dog for directly locking the switch handle, said dog pivotally mounted within the housing and normally biased to locked position, and means whereby the bolt is held against removal by the dog when the latter is in locked position.

3. A key controlled switch lock of the type described comprising a separable housing, a bolt for holding the separable parts of the housing together, a dog for directly locking the switch handle, said dog pivotally mounted within the housing and normally biased to locked position, and means whereby the bolt is held against removal by the dog when the latter is in locked position, and automatic means directly engaging the dog for holding it in unlocked position.

4. The combination with a switch stand lock having a locking dog therein for engagement with the horn of the switch stand, of a latch pivotally mounted adjacent the dog for interlocking engagement therewith to both prevent the dog from assuming a locked position and to maintain proper alignment of said latch in respect to said horn.

5. In a switch stand lock for attachment to the head of a switch stand wherein the switch handle is pivotally mounted, a two part locking dog comprising a normally horizontally disposed portion pivotally mounted at one end to the lock housing, and a depending vertically reciprocable portion pivotally attached to the other end of the horizontal portion and preventing movement of the handle when in its lowermost position.

6. In a switch stand lock for attachment to the head of a switch stand wherein the switch handle is pivotally mounted, a separable housing for said lock, a bolt having a notch therein for holding the housing in assembled relation, and a two part locking dog within the housing for normally preventing movement of the switch handle, a portion of said dog fitting within said notch only when the switch is locked.

7. A switch stand lock comprising a separable housing, a bolt having an annular notch therein for holding the housing in assembled relation, and a locking dog within the housing engageable within said notch only when the switch is locked.

In testimony whereof I affix my signature.

PETER SWANSON.