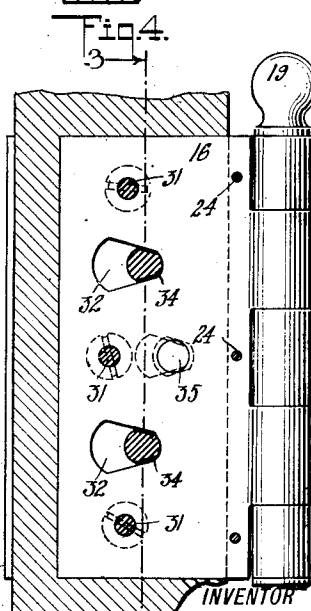
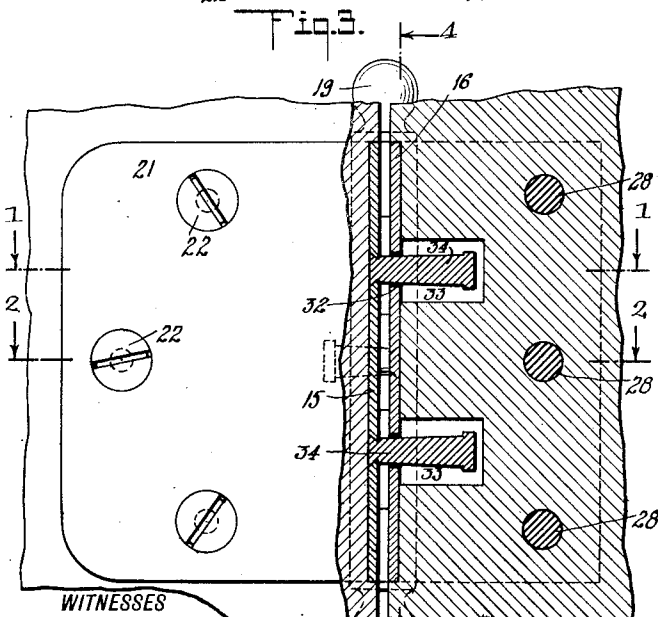
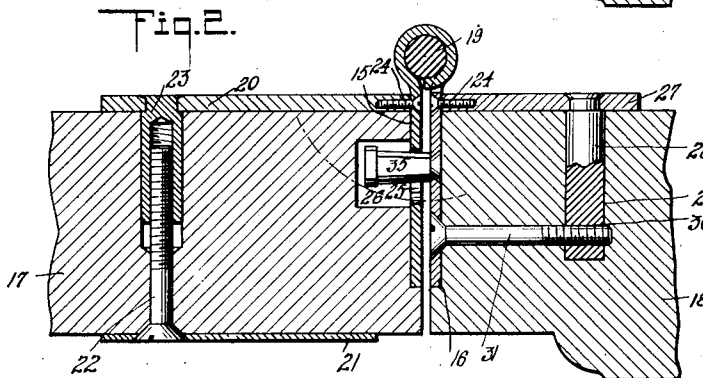
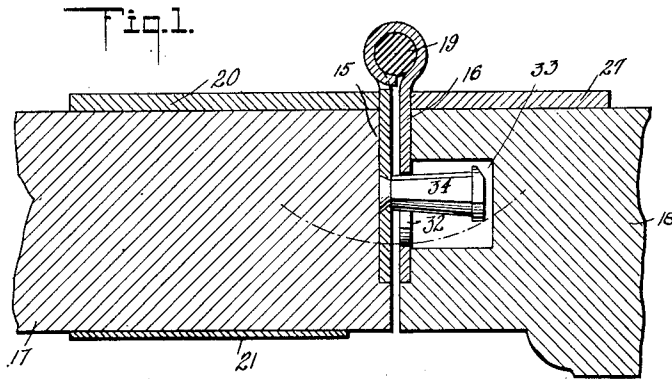


F. J. DOWLING.
LOCKING HINGE OR CONNECTOR.
APPLICATION FILED JUNE 2, 1920.

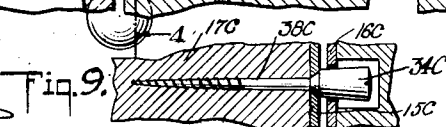
1,391,304.

Patented Sept. 20, 1921.

3 SHEETS—SHEET 1.



WITNESSES
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3 SHEETS—SHEET 2.

Fig. 5.

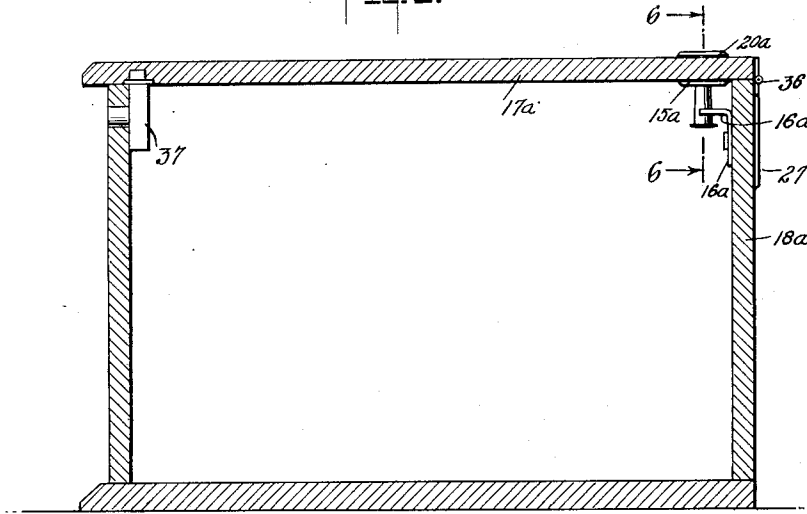


Fig. 6.

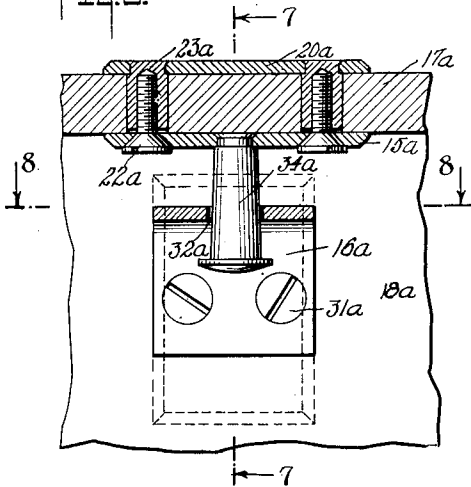
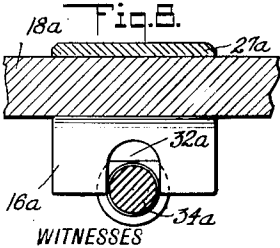
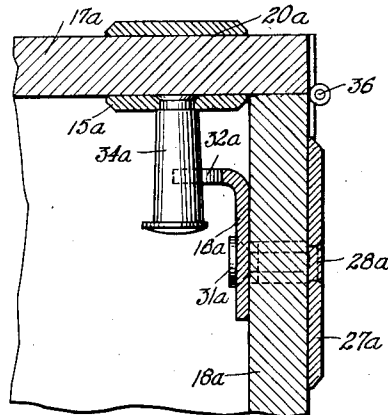


Fig. 7.



Frederick Diehl,
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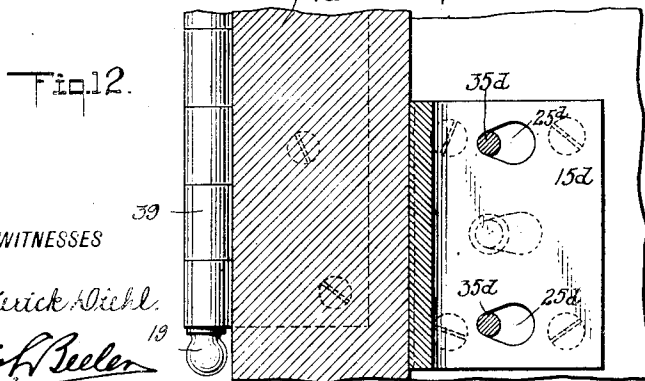
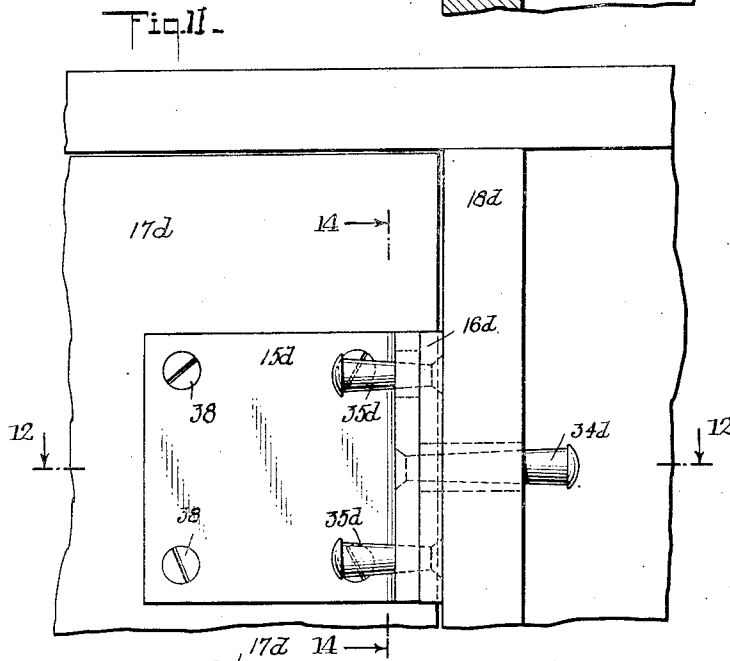
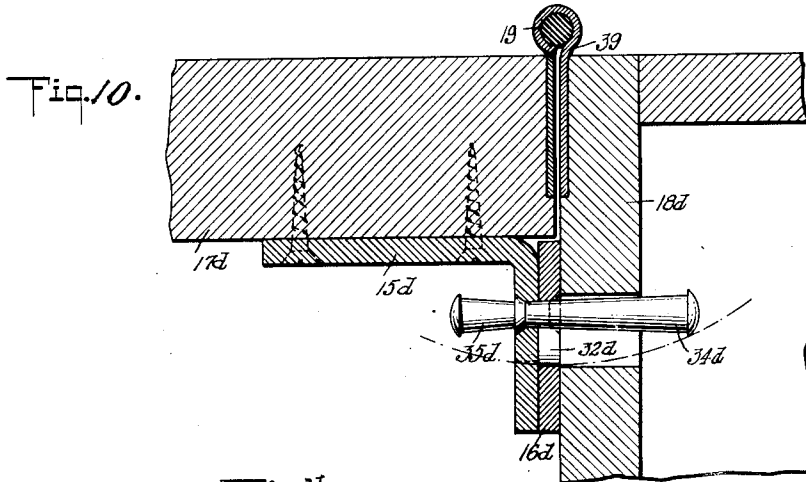
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1,391,304.

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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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LOCKING HINGE OR CONNECTOR.

1,391,304.

Specification of Letters Patent. Patented Sept. 20, 1921.

Application filed June 2, 1920. Serial No. 386,008.

To all whom it may concern:

Be it known that I, FRANCIS J. DOWLING, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Locking Hinge or Connector, of which the following is a full, clear, and exact description.

This invention relates to builders' hardware and has particular reference to hinges or analogous means for connecting one part of a machine or device movably or removably to another.

Among the objects of the invention is to provide a hinge or connector comprising two plates, or their equivalent, adapted to be secured to the door and jamb respectively, or their equivalent, and so arranged that, whether the hinge pin is used or not, they will prevent the movement of the door, or its equivalent, in any direction with respect to the jamb except the door be first unlocked so that it may be swung or moved in its intended direction.

Another object of the invention is to provide an auxiliary locking device either as a part of the hinge or separate therefrom, the auxiliary device including a plate having an opening and secured to one of the parts, the door or the jamb, and another plate having a head pin which when the movable part of the device, such as the door, is moved into closed position in the normal manner will enter and interlock in said opening or slot and so prevent all movement of the movable part except in the reverse direction.

Another object of the invention is to prevent the opening of a door or lid as a result of the removal of the hinge pins.

Another object of the invention is to provide a connector for the door or lid of a tool chest or the like which will prevent the opening of the door or lid even though the hinges thereof be removed or detached.

With the foregoing and other objects in view the invention consists in the arrangement and combination of parts hereinafter described and claimed, and while the invention is not restricted to the exact details of construction disclosed or suggested herein, still for the purpose of illustrating a practical embodiment thereof reference is had to the accompanying drawings, in which like

reference characters designate the same parts in the several views, and in which

Figure 1 is a horizontal sectional view of one form of my invention on the line 1—1 of Fig. 3.

Fig. 2 is a similar view of the same on the line 2—2.

Fig. 3 is a partial side elevation and partial vertical section on the line 3—3 of Fig. 4.

Fig. 4 is a vertical section on the line 4—4 of Fig. 3.

Fig. 5 is a vertical transverse section of a tool box or the like showing a modified form of the invention.

Fig. 6 is a vertical sectional detail on the line 6—6 of Fig. 5.

Fig. 7 is a vertical section on the line 7—7 of Fig. 6.

Fig. 8 is a horizontal section on the line 8—8 of Fig. 6.

Fig. 9 is a detail view indicating a combined connector pin and screw.

Fig. 10 is a horizontal section on the line 12—12 of Fig. 11 indicating another form of my improvement applied to a door auxiliary to an ordinary door hinge.

Fig. 11 is a side elevation of that form of the invention shown in Fig. 10.

Fig. 12 is a vertical section on the line 12—12 of Fig. 11.

For convenience of description I shall hereinafter employ the term "door" to cover any kind of a movable or removable door, lid, cover, or the like ordinarily attached to a relatively stationary part by a hinge or hinges. By the term "jamb" also I shall mean to cover a door post, jamb, or other relatively stationary part of the structure.

Referring to the first set of figures I show a hinge comprising two plates 15 and 16 secured to the door 17 and jamb 18 respectively by any usual or well known means and movably attached together by a hinge pin 19 which ordinarily is removable for the purpose of taking the door off the hinges without disconnecting the hinge plates. Auxiliary to the door plate 15 and constituting one of the means for attaching the plate 15 to the door is a plate 20 applied to or against one side of the door. A secondary plate 21 may be applied to or against the opposite side of the door parallel to the plate 20. Screws or similar fasteners 22 are passed through the plate 21 preferably from the

side opposite the hinge pin 19 and cooperating with socket pieces 23 countersunk or otherwise permanently fixed to or in the plate 20. This plate may be spoken of as a
 5 blind plate inasmuch as it may appear to an unauthorized person to be the only plate of the adjacent part of the hinge, but inasmuch as the fastening means for the plate 20 is hidden from the outsider it is impos-
 10 sible for him to disconnect the hinge or connector on the outside of the door. The plate 15 may be secured directly to the door 17 in the usual manner, or it may be connected only to the blind or auxiliary plate 20 by
 15 suitable means such as screws or the like indicated at 24. The plate 15 is provided with one or more slots or openings 25 and if necessary the door is provided with a cavity 26 just within the opening 25. This slot or
 20 opening 25 is preferably tapered toward the hinge pin 19.

The hinge plate 16 has its auxiliary or blind plate 27 secured rigidly as by screws 24 thereto. The socket pieces 28 of the blind
 25 plate 27 are fitted directly into drill holes 29 of the jamb and each of these socket pieces is provided with a tapped hole 30 perpendicular to the axis of the socket piece and into which a clamping screw 31 is adapted
 30 to be driven after first passing through the hinge plate 16. I indicate three of these screws 31 which serve to hold the plate 16 directly to the jamb and coincidentally lock the socket pieces 28 to the jamb, thus making
 35 a most effective anchorage for the hinge plate and blind plate 16 and 27.

The hinge plate 16 is provided with one or more openings or slots 32 substantially similar to the opening 25 of the other plate and
 40 likewise tapered toward the hinge pin 19. Adjacent to these openings 32 the jamb is provided with cavities 33.

Each of the plates 15 and 16 carries a rigid headed stud the axis of which is substantially perpendicular to such plate, such
 45 stud cooperating with one of the tapered openings or slots in the companion plate. In the form now being described the plate 15 carries two of the studs 34 cooperating with
 50 the slots 32, while the plate 16 carries one stud 35 cooperating with the slot 25. The larger or flaring end of each slot is so disposed as to provide for the free swing or movement relatively of the head portion of
 55 the stud cooperating with that particular slot. In other words as will be noted from Fig. 1 with the door swinging around the axis of the pin 19 the head of the stud 34 will pass freely outward through the larger
 60 end of the opening or slot 32, but when in closed position the shank portion of the stud lies nested closely in the smaller end of the slot 32. The same description applies to the studs 35 although as a matter
 65 of fact in the form now being described these

studs are stationary and the slots 25 will pass outward over the heads thereof when the door is swinging open. Thus it will be seen that the studs 34 and 35 will in no manner interfere with the normal swinging
 70 of the door on its hinges, but if the door hinge pins 19 were to be removed in an attempt to take the door off its hinges or open the door without unlocking it, the studs will prevent relative movement be-
 75 tween the door and the jamb in any direction. If the door be jimmied along its hinge line the heads of the studs, as well as the taper thereof, will prevent such attempt. The door could not be shoved inward be-
 80 cause this movement would be resisted directly by the studs 35. It could not be shoved or moved outward because of the cooperation between the studs 34 and the small ends of the slots 32. Obviously the
 85 door could not be moved up or down because of the interlocking action of all of the studs. In the preferred form of the invention, as illustrated in Figs. 1 to 4, the sides of the pins or studs 34 and 35 which contact with
 90 the beveled edges or walls of the slots 32 and 25 respectively, are flattened, and therefore there is insured a flat gripping contact between the studs and the plate making it
 95 an impossibility for the plates to move relatively outward toward the heads of the studs. I therefore do not need to rely upon the heads to prevent the stripping of the plates over the ends of the studs.

Referring now to Figs. 5 to 8 the door 17^a
 100 constitutes a box lid or cover having ordinary hinges 36 which are ordinarily applied to the outer surface of the structure and which for this reason are frequently de-
 105 tached in order to give access by an unauthorized person to the chest without unlocking the door at the lock 37. In this form of my invention the connector is not a structural part of the hinge and is shown
 110 as comprising an anchor plate 16^a attached to the jamb 18^a and a rigid stud 34^a fixed to the plate 15^a and having interlocking co-
 115 operation with the anchor plate in a slot 32^a. The anchor plate 16^a is so disposed that the stud 34^a cooperates with the slot 32^a in ex-
 120 actly the same manner as has already been described in the normal opening of the door around the axis of the hinge 36. The plate 15^a is preferably attached to the door 17^a
 125 by means of a blind plate 20^a having pieces 23^a for cooperation with screws 22^a passing through the plate 15^a. The anchor plate 16^a is adapted to be secured to the jamb by any suitable reliable means, but preferably I
 130 employ clamping screws 31^a passing through the anchor plate into the socket pieces 28^a having fixed cooperation with a blind plate 27^a corresponding generically to the cor-
 135 respondingly numbered parts in Figs. 1 and 2. It will be apparent that even though the

hinge pins, or even the hinges 36 be removed the door 17^a cannot be opened or moved in any direction with respect to the stationary part of the structure without first unlocking the same at 37. The door could not be jimmied without lifting it from the jamb, but this movement would be prevented by the head or tapered portion of the stud, and as in the other form of the invention the auxiliary devices cannot be tampered with from the outside of the structure because of the blind plates.

As indicated in Fig. 9 any of the studs such as 34^c may be combined with a screw 38^c so as to embody in the same element the features of the interlocking stud for coöperation with an oppositely disposed plate 16^c and a screw for locking a plate 15^c to the door 17^c.

In Figs. 10 to 12 I show that form of my invention adapted for application to a door and jamb in a structure already provided with a hinge 39 having a pin 19, that is to say, in any finished structure including a door 17^d and a jamb 18^d I may attach a plate 15^d on the inner face of the door for coöperation with an anchor plate 16^d fixed to the jamb. Each of these plates is provided with one or more studs, as 34^d or 35^d coöperating with a slot 32^d or 25^d respectively. These parts may be attached to the respective supports by any suitable means such as screws 38 and do not interfere in any manner with the usual hinges 39 or the operation thereof. The manner of use, however, and functions of these auxiliary locking devices are essentially the same in all forms of the invention.

In the preferred forms of the invention in which there are employed more than one stud it will be observed that the studs are of different lengths so that the longer studs enter their slots before the shorter studs enter their slots when the connector is going into closed or locked position. Consequently for the disconnection of the parts the shorter studs are first to leave their slots. This fact of construction makes it obvious that if the two plates having interlocking studs and slots are to be separated from each other surreptitiously or by relative movement in any other direction than that intended, the disparity in lengths of studs will make it exceedingly more difficult for such separation or opening to be accomplished. I wish to point out also that the walls or edges of the slots which coöperate directly with the tapered sides of the studs are similarly beveled or tapered so that there is produced a relatively flat and strong bearing contact rather than an edge or biting contact in practice. If the connector for instance is employed in connection with a device or machine in which there is considerable vibration an edge or

biting contact between the wall of the slot and the stud would cause the stud to be worn in such a manner as to set up considerable vibration and looseness or rattling.

As predicated above it will be understood that this device may be employed for connecting independent parts of knock-down structures or machinery as well as for the purposes otherwise specified.

I am aware that it is not broadly new to provide hinge plates with interengaging features in addition to the hinge pin and knuckles connected thereby, but so far as I am aware it is new to provide interlocking plates, whether for hinges or otherwise, which have interlocking means preventing positively all relative movement between the two plates except in one predetermined direction.

I claim:

1. A device of the character set forth comprising two plates adapted for normal movement with respect to each other in a certain direction, one of the plates having an opening, rigid tapering means carried by the other of the plates and coöperating with said opening to prevent relative movement between the plates in any other direction than said normal direction.

2. A device of the character set forth comprising a pair of plates, pivot means serving to provide for the movement of one of the plates in the arc of a circle with respect to the other plate, rigid tapering means fixed to one of the plates and overlapping the other plate and serving to prevent relative movement between the plates in any other direction than in the direction stated.

3. A device as set forth in claim 2 in which the rigid tapering means projects perpendicularly from the plate that carries it.

4. A device as set forth in claim 2 in which the rigid means consists of a headed stud projecting from the plate at right angles and coöperates with a slot formed in the other plate.

5. The herein described locking device comprising a plurality of plates, means to cause said plates to move apart in a predetermined normal direction, each of said plates having an opening with beveled edges and each of the plates furthermore being provided with a rigid stud tapered to conform to the edges of the opening therefor, the stud of one plate having interlocking coöperation with an opening of the other plate whereby to prevent relative movement between the plates in any other direction than the normal one intended.

6. A device as set forth in claim 1 in which the rigid means comprises a tapered stud having flat sides.

7. A device as set forth in claim 1 in which the rigid means comprises a stud having flat sides, the stud being flared out-

ward toward its free end, and a plate having a slot to receive the stud and having tapered or beveled engaging walls for cooperation with said flat sides of the stud.

- 5 8. The herein described hinge comprising a pair of plates, a hinge pin connecting them for movement in an arc of a circle, another pair of plates connected respectively to the first mentioned plates and extending there-
 10 from at right angles and connecting means to secure the respective pairs of hinge plates to the door and door jamb, said connecting means including a secondary plate, a socket piece connected to one of the hinge plates,

and a screw passing through the secondary 15 plate into the socket piece.

9. A device as set forth in claim 1 in which rigid means are carried by each of the plates for cooperation with the other plates respectively.

10. A device as set forth in claim 1 in which rigid interlocking means are carried by both of the plates for cooperation with the other plates respectively, some of the rigid means being longer than the others 25 whereby the rigid means enter the respective plates at different times.

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