United States Patent [19]

Joersz

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[54] **LOCKING DEVICE**

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[52] **U.S. Cl.** **70/19;** 70/77; 70/95; 70/DIG. 63

[51] **Int. Cl.**[2] **E05B 65/00;** E05B 65/08; E05B 73/00

[58] **Field of Search** .... 292/256, 281, 288, DIG. 46; 70/14–15, 18, 262, 263, DIG. 63, 19, 237, 238

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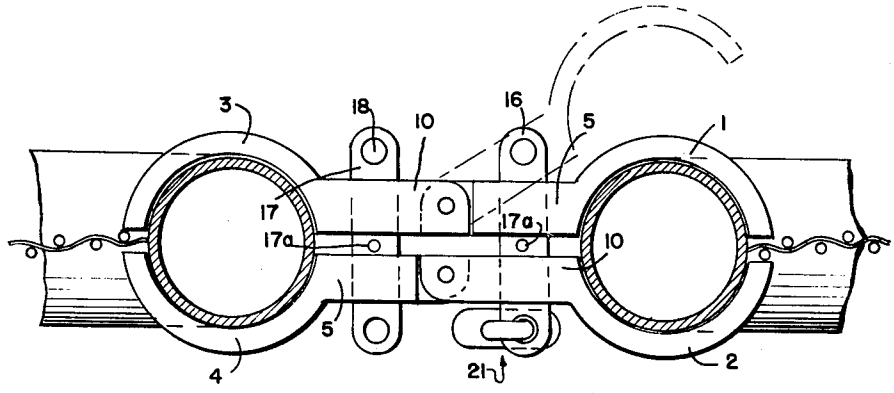
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[57] **ABSTRACT**

The invention concerns a detachable locking device to prevent relative movement of swinging or sliding closure members. The locking device accomodates a plurality of separate locks accessible from either side of the closure members when in closed condition. The construction of the locking device permits all the locks to be opened by a common means, key or combination, or any one of the plurality of locks may be opened separately by a different key or combination to gain access through the closure members.

5 Claims, 3 Drawing Figures



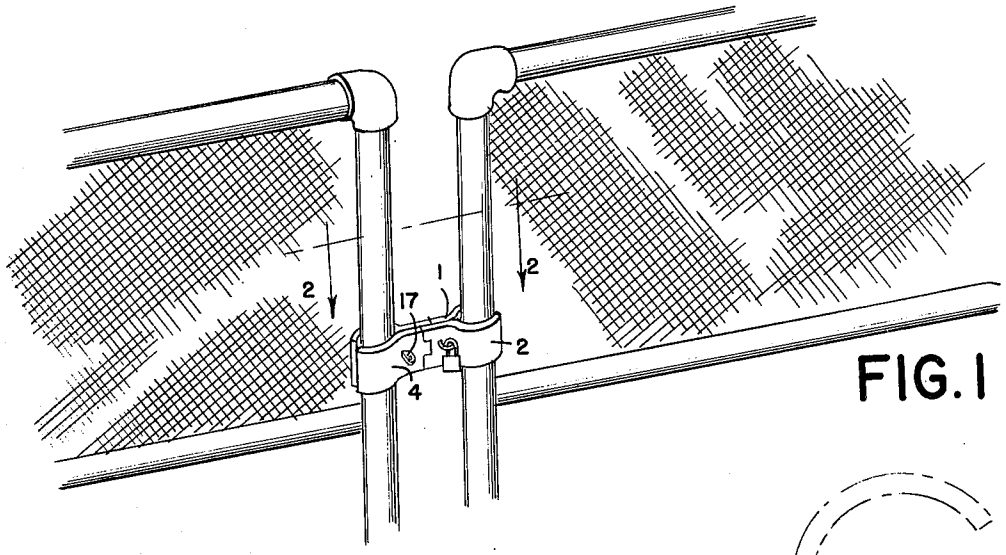
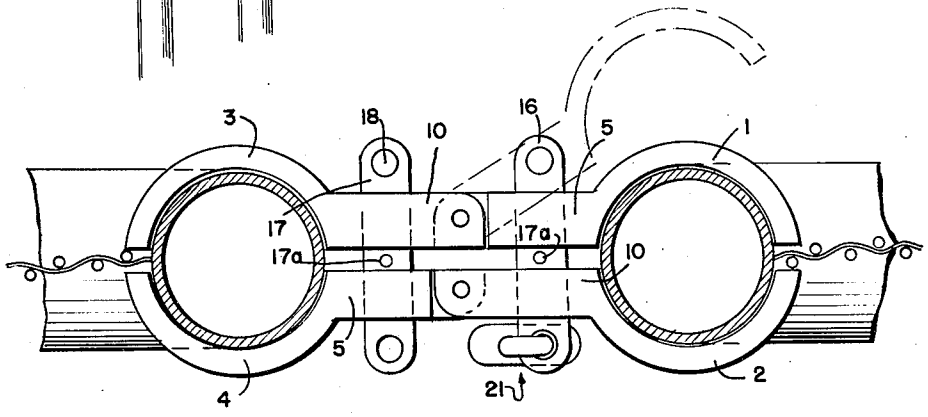


FIG. 1

FIG. 2



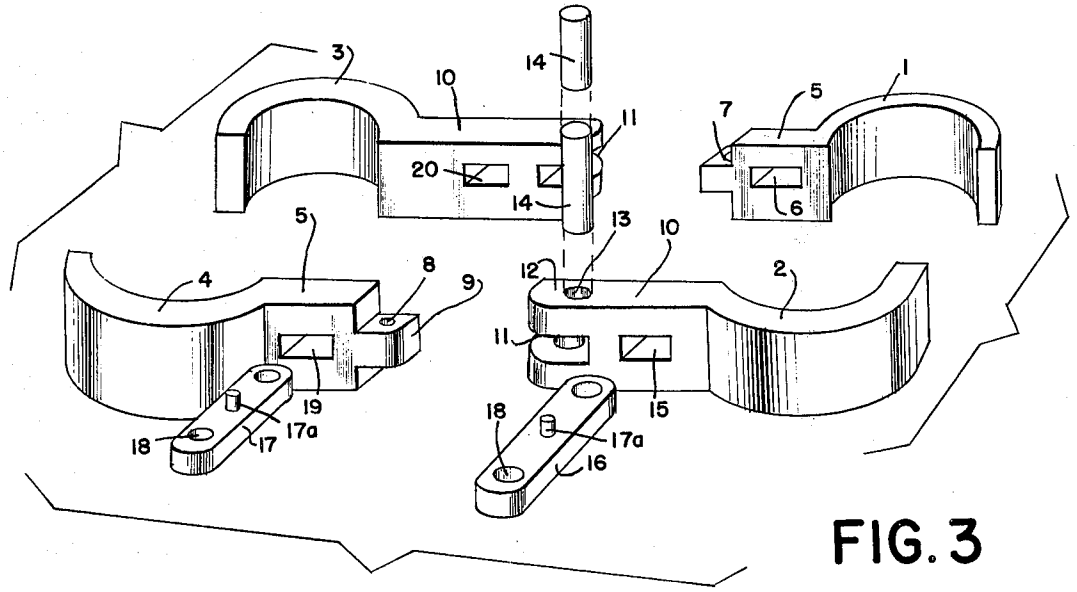


FIG. 3

LOCKING DEVICE

The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment of any royalty thereon.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention is in the field of locking devices. More particularly it concerns a detachable locking device in which a plurality of separate locks are used in a detachable construction to maintain adjacent, sliding or swinging closure members in a closed, locked condition but in which any one lock of the plurality of locks may be opened by a key or a combination means to permit opening the closure members for access therethrough with the remaining locks in a locked condition. Alternatively, all the plurality of locks may be opened by a single key or combination.

2. Description of the Prior Art

The most rudimentary, well-known form of locking device in the prior art for preventing closure members from sufficient movement to permit access to an area in a chain connecting the closure members wherein the ends of the chain are joined in a closed loop by a single locking means. In circumstances where more than one lock is needed to give access to a closed area by more than one person, in this arrangement, then more than one chain loop, each closed by a separate lock, is required. This can be cumbersome and may not be capable of being accomodated by a particular construction of a closure means. Hasp and staple type locking means for maintaining abutting doors in closed condition are shown by Fairand in U.S. Pat. No. 1,566,662. May in U.S. Pat. No. 2,629,619 describes a hasp and staple arrangement for sliding doors. Both of these arrangements permit locking and unlocking from either side but differ structurally from the instant invention and must be permanently secured to the closure members whereas the instant invention is a detachable device. Thomas in U.S. Pat. No. 2,963,895 discloses a locking device which embodies a pair of arms which may be connected and are attached to a sliding member encased in a guide. The sliding members and the guide have holes, which when in registering position, accept a pair of locks which, when locked, prevent sliding movement of the sliding member relative to the guide and keep the arms in closed condition. Although this device is detachable and can be used for fence gates and permits use of the same or a different key for each lock it differs structurally and operates differently from the instant invention herein described. The Thomas device has the same limitations as a plurality of chains each closed by a lock if more than two locks using different keys are used in a space which can only accomodate one set or pair of clamping arms and consequently a limited number of locks which in turn limits the primary purpose of the device. A locking device employing a sliding bar having an opening for receiving a lock to keep the locking device in closed condition is shown by Hysmith in U.S. Pat. No. 3,498,400 for a battery. This device differs in structure from the instant invention and employs only a single lock. If a plurality of these devices were used to plural locks it would have the same disadvantage as the Thomas device described above. Locking devices employing oppositely disposed clamping members such as in handcuffs or fettering devices are known for example, as in Smith U.S. Pat. No. 3,618,345. Smith shows a hinge sructure connecting the handcuffs and a lock cooperating with a ratchet mechanism for maintaining the handcuffs in closed condition. The interengaging hinge structure and cooperating lock arrangement are a more complex construction than the simple device of the instant invention and would require a plurality of such devices to satisfy the need for more than two locks and would be cumbersome. This structure lacks the simplicity of the structure of a sliding bar, accomodating the locks, interconnecting the hinges of the plural clamping members as in the instant invention.

SUMMARY OF THE INVENTION

The invention is a detachable locking device having oppositely disposed pairs of clamping members adapted to grip the contour of a part of sliding or swinging closure members to maintain the closure members in a closed, locked condition. Each clamping part of the oppositely disposed pairs of clamping members terminates in a projection adapted for hinged interengagement with a projection on a similar clamping part of an oppositely disposed pair of clamping members. A bar member having holes in the terminal ends thereof passes through bores in the projections located between the hinge point and the clamping part. When in position for locking the pairs of clamping members to maintain the sliding or swinging closure members in locked condition the bars are transverse to the axis of the hinge, interconnect the projections by passing through the bores with the holes extending beyond the projections to receive locking means in the terminal holes. Unlocking of any one locking means and removal from the opening in the associated bar permits removal of the bar from the bores of the projections which it interconnects. Upon sliding removal of the bar from the bores the clamping parts of the particular pair of clamping members may be rotated to open position about the hinge joints in the projections associated with the particular pair of clamping members permitting the swinging or sliding closure members to be opened. The oppositely disposed pairs of clamping members receive two bars in the projections, each bar having terminal holes in the ends thereof can accomodate two locking means or a total of four locking means for each detachable clamping device. The locking means may each be opened by a separate key or combination or alternatively, all or any combination of locking means may be opened by the same key or combination. In instances where entrance to an area which is protected by a perimeter fence with swinging or sliding closure members is desired, entry by four separate agents or employees of, for example, contractors or maintenance organizations is possible. Each agent or employee is provided with a key or combination to open just one of the locking means from inside or outside the enclosure which permits removal of the corresponding bar member by sliding out of the bores of the particular associated pair of clamping members, rotating the clamping part of the associated pair of clamping members to permit opening the closure members and gain entry to the enclosed area. In cases where locked equipment may be within the enclosed area, the key or combination which opens the locking device of the instant invention may also be used to open the locking means on the equipment thus reducing the number of keys or combinations required to open both the sliding or swinging closure members

to the enclosure and the equipment. Each employee or agent thus has access to the enclosed area and access only to specified equipment with a single key or combination. The clamping device of the instant invention has rugged, simple, easily fabricated parts which may be readily replaced in the event of attempted vandalism or other damage or deterioration through wear. The prior art devices have the disadvantages noted above and are not as readily or simply applicable for securing sliding or swinging closure members to areas desired to be secured or restricted only to authorized entry.

It is a principal object of the invention to provide a detachable locking device adapted for use with sliding and swinging closure members wherein a plurality of locking means connected to hinged pairs of clamping members permit selective operation of said clamping members.

It is a further object of the invention to provide a detachable locking device wherein locking bar means cooperate with hingedly connected pairs of clamping members for use with sliding and swinging closure members.

It is a further object of the instant invention to provide a detachable locking device having pairs of hinged interconnected clamping members adapted to lock swinging or sliding closure members and including locking bars adapted to receive locking means, said locking bars simultaneously interconnecting and locking said clamping members.

It is a further object of the invention to provide a detachable locking device for use with swinging or sliding closure members having pairs of oppositely disposed, separable clamping members contoured to portions of said closure members wherein said separable clamping members include hinged, interengaging projections receiving locking bar means disposed transversely to the axis of said hinge for uniting said separable clamping members in locked condition.

These and other objects will become apparent from the description of the invention wherein:

FIG. **1** is a view showing the manner of using the detachable locking device on a gate for a fence;

FIG. **2** is a view in the direction of the line **2**—**2** of FIG. **1** of the detachable locking device when in closed position of the clamping members except with a separable portion of one pair of clamping members in open position; and

FIG. **3** is an exploded view of the detachable locking device showing the individual components and their interrelation.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Reference is made to FIG. **3** of the drawing wherein the preferred embodiment includes a first and second pair of clamping members having separable portions **1**, **2**, **3** and **4**. The contour of the clamping members are shown as arcuate but may be any convenient contour corresponding to the peripheral shape of the part of the closure member to which the locking device is attached. Extending from clamp portion **1** is a projection **5** having a bore **6**, which may be of any desired convenient cross-section, the axis of which is in a direction parallel to the length of the tongue **7** at the terminal end of the projection **5**. Tongue **7** is provided with a hole, not shown, but similar to **8** in tongue **9** on clamp portion **4**. it is noted that clamp portions **1** and **4**, diagionally disposed, are of similar configuration. Clamp portion **2** has an extension **10**, provided with a clevis or groove **11**, each leg **12** of which has a hole **13** therethrough and the holes in each leg are in registering relation to receive a pin **14**. Pin **14** interconnects and retains tongue **9** in groove or clevis **11** and forms the hinge connection of the diametrically opposed clamp portions **2** and **4** and **1** and **3**, respectively, of each of the pairs of clamping members when they are in assembled condition. Projection **10** is provided with a bore **15** which in the locked condition of the clamping members **1** and **2** will be in registry with bore **6** and receive locking bar **16**. It is noted that clamp portions **2** and **3**, diagonally disposed, are of similar configuration. Locking bar **16** is provided with holes **18** ajdacent the ends of the bar. When bar **16** is received in bores **6** and **15** of clamp portions **1** and **2**, the bar is of sufficient length so the ends with the holes **18** project beyond the outside ends of the bores **6** and **15** and the clamp portions **1** and **2** have their facing surfaces in contact. When the bar **17** is received in bores **19** and **20** of clamp portions **3** and **4**, holes **18** of bar **17** project beyond the outer edges of bores **19** and **20**. Bars **16** and **17** are provided with pin **17***a* which prevents the locking bars from falling out or being removed upon removal of any one lock.

When it is desired to lock sliding or swinging closure members, the instant locking device is attached to the closure members in the manner shown in FIG. **1** with the hinge pins **14** inserted through the bores **8** and **13** of the interengaging tongue **7** and clevis **11** portions and the bars **16** and **17** are received in the registering bores **6**, **15** of clamp portions **1**, **2** and bores **19** and **20** of clamp portions **3** and **4**. Padlocks are secured through the openings **18** of the bars **16** and **17** as shown at **21** in FIG. **2**. Any one of the clamp portions **1**, **2**, **3** and **4** can be unlocked and swung on it's hinge by unlocking either one of the padlocks associated with the bar nearest the clamp portion to be opened.

The drawing in FIG. **1** shows the locking device in use on aligned closure members. By orienting the locking device in a direction perpendicular from that shown in FIG. **1** it could be used on non-aligned, sliding closure members which move in a parallel direction. It is evident that any one of the four locks, when unlocked, will permit opening of one or both of the associated clamping portions.

A rugged, simple, easy to manufacture, detachable locking device accomodating a plurality of independently operated locks from inside or outside of a secured area is provided which overcomes the disadvantages of the prior art devices as noted above.

Variations of the specific embodiment which will be apparent to those skilled in the art can be made without departing from the teachings of the instant invention.

I claim:

1. A detachable locking device for securing adjacent, cooperating closure members to prevent relative movement of the closure members comprising:

a. opposed pairs of clamping members having first and second longitudinally aligned portions, said members configured to engage closure members and said first and second portions including projections with centrally located receiving means;

b. interengaging, hinged connecting means joining the ends of said projections of said first portions with the ends of said projections of said second portions of each of said pairs of clamping members and cooperating with said portions to maintain

them in predetermined relation when said clamping members are in closed condition; and

c. removable lock engaging members joined said first portions together and said second portions together when said clamping members are in closed condition, said lock engaging members disposed within said receiving means and having ends with openings therein projecting beyond the edges of said projections to receive locking means and extending transversely of the length of said projections when said clamping members are in closed condition whereby said locking device maintains the closure members in predetermined relation when said removable lock engaging member joins said first and second portions of each of said pairs of clamping members and receives said locking means.

2. A detachable locking device for securing adjacent, cooperating closure members to prevent relative movement of the closure members comprising:

a. pairs of clamping members disposed in tandem arrangement and comprising first and second portions, said first portions having aligned facing surfaces and said second portions having aligned facing surfaces in closed condition of said pairs of clamping members, said members configured to engage closure members;

b. said first and second portions of each of said pairs of clamping members disposed for mutual relative movement of said first and second portions, such relative movement creating diametrically opposed openings between facing surfaces of each of said pairs of clamping members;

c. hinged members projecting from said portions of said pairs of clamping members interconnecting said first and second portions of each of said pairs of clamping members, said hinged members having centrally located receiving means on either side of the hinges; and

d. removable means disposed within said receiving means interconnecting said hinged members and adapted to receive locking means for maintaining said first and second portions of each of said pairs of clamping members in closed condition when said locking means are in locked condition and to permit said first and second portions of each of said pairs of clamping members to be selectively, individually, relatively moved to an open position when said locking means are unlocked to permit relative movement of the adjacent, cooperating closure members.

3. A detachable locking device for securing adjacent, cooperating closure members to prevent relative movement of the closure members comprising:

a. pairs of clamping members disposed in tandem arrangement and comprising first and second portions, said first portions having aligned facing surfaces and said second portions having aligned facing surfaces in closed condition of said clamping members;

b. said first and second portions of each of said pairs of clamping members disposed for mutual relative movement of said first and second portions, such relative movement creating diametrically opposed openings between facing surfaces of each of said pairs of clamping members;

c. said first and second portions including projections, the ends of each of said projections engaging an end of a projection on a corresponding diametrically opposed portion in hinged relation; and

d. removable means interconnecting said projections of each pair of said clamping members, said means adapted to receive locking means and maintain said first and second portions of each of said pair of clamping members in closed conditions when said locking means are in cooperating engagement with said interconnecting means and in locked condition and to permit selective, independent, relative hinged movement of each of said first and second portions when said locking means are unlocked to permit relative movement of the adjacent, cooperating closure members.

4. A locking device as recited in claim **1** wherein said means for securing closure members comprises said first and second portions of said clamping members configured to the circumferential outline of the portions of the adjacent, cooperating closure members engaged by said clamping members.

5. A locking device as recited in claim **3** wherein said projections have tongue and groove portions with a first bore therethrough and axle means received in said first bore to provide engagement of said tongue and groove portions of said projections and relative rotation of said projections; each of said projections further provided with a second bore located intermediate said tongue and groove portion and said first and second portions of said clamping members in registering relation when said first and second portions of said clamping members are in registering relation; the axis of said second bore being substantially normal to the axis of said first bore in each of said projections; said means interconnecting said projections received in said second bore of each of said projections when said second bores are in registering relation; said means interconnecting said projections including apertures, said apertures projecting beyond the ends of said second bores when said projections of said first and second portions are in registering relation and adapted to receive locking means.

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