

March 3, 1964

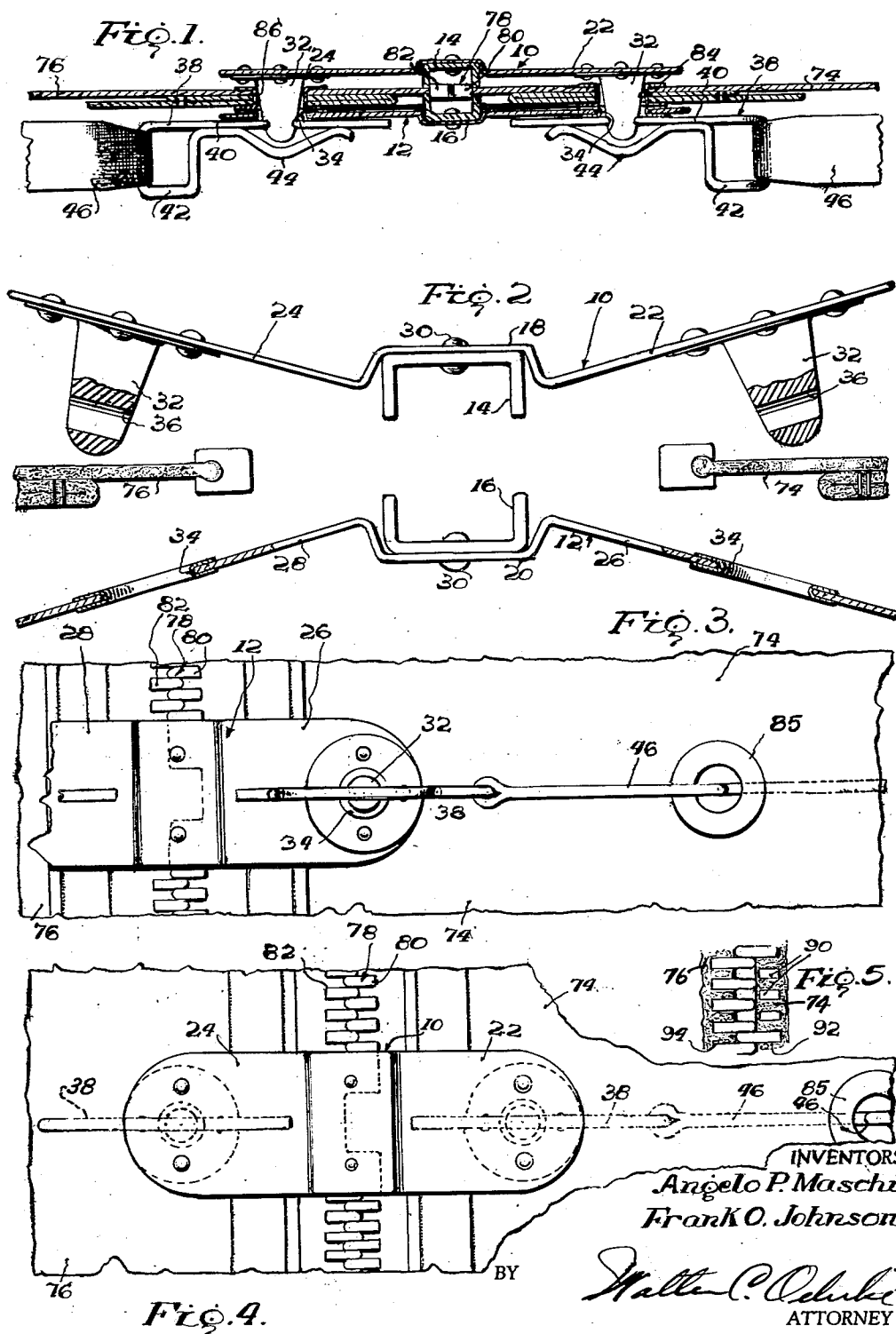
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3,122,808

SLIDE FASTENER AND QUICK RELEASE

Filed Jan. 9, 1962

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2 Sheets-Sheet 2

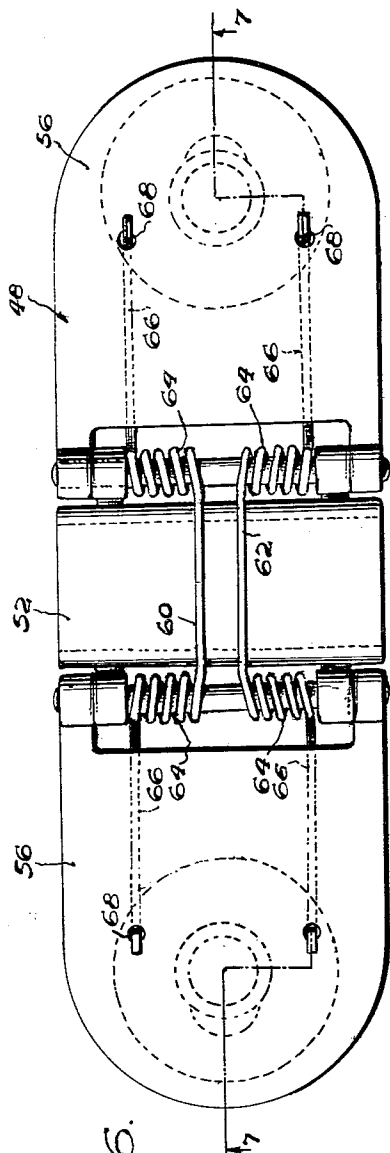


Fig. 6.

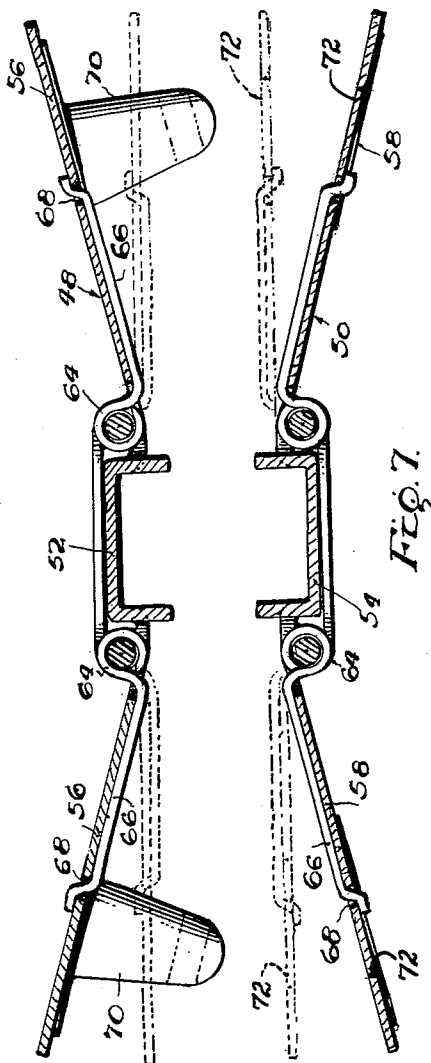


Fig. 7.

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SLIDE FASTENER AND QUICK RELEASE

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America as represented by the Secretary of the Army
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9 Claims. (Cl. 24-205)

(Granted under Title 35, U.S. Code (1952), sec. 266)

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

The present invention relates to releasable connecting
mechanisms for use in conjunction with slide fasteners
and more particularly to a mechanism which is operable
to effect substantially instantaneous end to end release
or parting of a closed slide fastener.

While mechanisms for releasing the starting ends of
the stringers in slide fasteners from positions at which
they may be caused to interlock by the passage of a
slider along the same so as to permit complete separation
of the stringers are known, these mechanisms require that
the stringers first be uncoupled to the fullest extent possi-
ble by means of the slider. These mechanisms thus fail
to take advantage of the fact that coupled stringers will
separate substantially instantaneously from end to end
thereof without the aid of a slider solely in response to
the release of one or more pairs of the interlocked claws
or teeth in the coupled stringers at some point in the end
to end length thereof, such as the starting point of the
stringers. The releasable connection of the present in-
vention, in contrast to known releasable connections, is
designed for this latter purpose so that a slide fastener may
be adapted to be separated substantially instantaneously
throughout its length by equipping the same with the con-
nection of the present invention.

Accordingly, an object of the invention is to provide
a new and improved releasable connection by means of
which substantially instantaneous separation of the string-
ers in a slide fastener throughout their end-to-end length
may be effected.

Another object of the invention is to provide a new and
improved releasable connection by means of which
separation of the stringers in a slide fastener may be ef-
fected without the aid of a slider.

Yet another object of the invention is to provide a new
and improved releasable connection as defined in the
preceding objects including latching mechanism to lock
the improved connection in operative position with respect
to a slide fastener which latching mechanism is biased so
as to open with a snap action when released.

A further object of the invention is to provide a new
and improved releasable connection as defined in the pre-
ceding object in which means is provided to release the
latching mechanism from positions remote from the re-
leasable connection.

A still further object of the invention is to provide a
new and improved wall construction including separable
sections connected together by a fully separable quick-
release type slide fastener and a quickly-releasable con-
nection which upon release initiates substantially instan-
taneous separation of the slide fastener throughout its
length and thereby releases the wall sections from inter-
connection substantially instantaneously.

A more general object of the invention is to provide a
new and improved quickly-releasable connection for the
purposes described above which is simple, inexpensive
and durable in construction, easy to operate and yet fully
reliable in operation.

These and other objects, advantages and capabilities of
the invention will become apparent from the following

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description wherein reference is had to the accompanying
drawings in which:

FIGURE 1 is a sectional view of the improved con-
nection of the present invention in operative or locked
position;

FIGURE 2 is a side elevational view on an enlarged
scale of the releasable connection of the present inven-
tion fully released;

FIGURE 3 is a fragmentary plan view of the under or
downwardly facing side of the releasable connection of
the present invention;

FIGURE 4 is a fragmentary plan view of the top or
upwardly facing side of the releasable connection of the
present invention;

FIGURE 5 is a fragmentary view of a somewhat mod-
ified slide fastener, showing the point from which quick
parting of the stringers thereof may commence;

FIGURE 6 is a top plan view of a modified form or
releasable connection; and

FIGURE 7 is a cross sectional view of the connection
shown in FIGURE 6 with the parts in fully released
position.

Referring to the drawings wherein like characters of
reference are used to designate like parts throughout the
several views and more particularly to FIGURE 2, the
improved releasable connection of the present invention
includes a pair of elongated connecting members 10 and
12 which may comprise elongated straps of spring steel
(see FIGURE 4) and rigid generally channel shaped in-
termediate body members 14 and 16, respectively. The
resilient straps are conformed to provide generally chan-
nel shaped intermediate parts 18 and 20, respectively,
from which extensions or wings project laterally in op-
posite directions, those on intermediate part 18 being
numbered 22 and 24 and those on intermediate part 20
being numbered 26 and 28. By reference to FIGURE 2,
it will be noted that these lateral extensions or wings 22,
24, 26 and 28 are biased to lie in planes inclined from
or bowed outwardly of the planes of the intermediate
channel shaped parts 18 and 20 when the connecting mem-
bers are in relaxed condition. The intermediate channel
shaped parts 18 and 20 of the resilient straps are fixedly
secured to the webs of the rigid channel shaped body
members 14 and 16, respectively, as by riveting, for ex-
ample, as shown at 30 in FIGURE 2.

Elongated connecting member 10 has cone shaped pro-
jections 32 secured thereto adjacent the extremities of the
lateral extensions 22 and 24 in any suitable manner, while
the second elongated connecting member in each pair, i.e.
connecting member 12, has grommets 34 adja-
cent the extremities of the lateral extensions 26 and 28
which define sockets dimensioned to receive the locking
cones 32 previously described. The latter have trans-
verse apertures or bores 36 adjacent the spherically
rounded apical ends thereof into and through which latch
pins 38 (FIGURE 1) may be projected for a purpose to
be described. These latch pins, which may be made of
resilient wire, each are formed to provide a straight por-
tion 40 to engage in the transverse aperture 36 in a lock-
ing cone 32, a looped portion 42 at one end thereof and
a humped portion 44 forming a detent to cooperate with
the apical portion of a locking cone when the latch pin
is seated in the transverse aperture 36 therein to prevent
accidental dislodging of this latch pin from seated or
locking position in the transverse aperture 36.

Separate pull cords 46 looped, respectively, through the
looped portions 42 on the latch pins 38 are provided
forceably to withdraw the latch pins from seated position
in the transverse apertures 36 in the locking cones 32 in
opposition to the resilience of the humped detents 44.

The modified releasable connection disclosed in FIGURES 6 and 7 comprises elongated connecting members 43 and 50 having rigid generally channel shaped intermediate parts 52 and 54, respectively, to which rigid lateral extensions or wings are hinged, those on the connecting member 43 being numbered 56 and those on the connecting member 50 being numbered 58. A pair of stressed double grasshopper torsion springs 60 and 62 each having intermediate portions 64 coiled around the pintles upon which the lateral extensions 56 and 58 are hinged and laterally extending fingers 66 hooked at the outer ends in apertures adjacent the outer extremities of the hinged lateral extensions as shown at 68 normally bias the latter into planes inclined to the planes of the webs of the intermediate channel shaped parts 52 and 54 as shown in FIGURE 7.

As also shown in that view, the connecting member 48 has transversely apertured locking cones 70 rigidly fixed adjacent the outer extremities of the hinged extensions 56 thereon similar to the cones 32, and the second elongated connecting member 50 has apertures 72 in the outer extremities of the hinged extensions 58 dimensioned to receive the locking cones 70.

The improved releasable connection of the present invention was designed particularly for use upon air erected and supported building structures of the type disclosed in Walter W. Bird et al. application for patent, Serial No. 26,382 for a "Quickly Strikable Air Supported Building Structure" filed May 2, 1960, and the use thereof in conjunction with such a structure will now be described. Building structures of this type have a flexible wall of sectional construction, the structure disclosed in the aforesaid patent application consisting of two sections releasably connected together by a completely separable quick release type slide fastener running in opposite directions along the ridge line of the building structure from a starting point intermediate the ends of this ridge line. While the aforesaid application for patent discloses a connection for releasably holding the starting ends of the slide fasteners at this starting point, the releasable connection of the present invention is designed to be substituted for that connection, although it is not intended that use of the invention be limited to this one purpose.

Assuming FIGURES 3 and 4 show a fragment of a building structure of the type disclosed in the aforesaid application of patent, separable wall sections corresponding to the two halves of the building are indicated at 74 and 76 releasably connected together by a slide fastener 78 including stringers 80 and 82 of the quick release type. These stringers are designed to part in substantially instantaneous response to release from operative relationship of the portion thereof bridged by the elongated connecting members 10 and 12 by virtue of stress on the stringers due to the pressure which must be maintained in the building structure to keep it erect. Separation of the stringers 80 and 82 proceeds in opposite directions from the region shown in FIGURES 3 and 4 toward the opposite ends of the stringers.

As indicated in FIGURE 1, the adjacent wall sections 74 and 76 have grommeted apertures 84 and 86, respectively, dimensioned to receive the locking cones 32. Referring to FIGURES 3 and 4, it will be seen that wall section 74 has a second grommeted aperture 85. Wall section 76, likewise, has a second grommeted aperture (not shown) similarly located with respect to the first grommeted aperture 86. The purpose of these second apertures will be described subsequently.

In the use of the improved releasable connection, the two elongated connecting members 10 and 12 are disposed in opposed relation on opposite sides, i.e., the inner and outer sides of the adjacent wall sections 74 and 76 of a deflated building structure with the open sides of the rigid channel shaped body members 14 and 16 facing each other and in close straddling relation to the opposed stringers 80 and 82 in the slide fastener 78 as shown in

FIGURE 1. The locking cones 32 will then be aligned with the first grommeted apertures 84 and 86 in the adjacent wall sections 74 and 76, respectively, and with the apertures or sockets 34 in the lateral extensions 26 and 28 on the connecting member 12. By forcing together the lateral extensions on the two connecting members on first one side and then the other of the parting line between the adjacent wall sections 74 and 76, defined by the slide fastener 78, until the locking cones 32 project through the grommeted apertures 84 and 86, respectively, in the wall sections and seat in the sockets 34, and then locking the cones 32 in this position by projecting latch pins 38 into the transverse apertures 36 in the cones as shown in FIGURE 1, the opposed sections 74 and 76 of the building structure may be releasably connected together by the use of the releasable connection of the present invention at least in the immediate vicinity of the area bridged by the connecting members 10 and 12.

As best seen in FIGURE 3, the pull 46 for the latch pin 38 shown in that view is threaded through grommeted aperture 85 to lead the same from the inside to the outside of the building structure. The pull cord for the latch pin 38 (FIGURE 4) associated with the second wall section 76 likewise should be threaded through the second grommeted aperture (not shown) in this second section. These apertures thus guide the pull cords 46 for the two latch pins 38 outwardly of the slide fastener 78 which forms the parting line between the two wall sections 74 and 76. On the exterior of the building structure, the pulls 46 may be led in any desired direction.

In describing the manner in which the improved releasable connection of the present invention operates to effect a substantially instantaneous end-to-end separation of the slide fastener 78, it will be assumed that a building structure having slide fastener connected adjacent wall sections, as described in the aforesaid application for patent, has been erected by inflating the same to the required pressure and that the opposed wall sections in this building are held in operative relation to each other in the region at which it is desired to have a quick parting of the slide fastener 78 commence by a releasable connection of the type herein disclosed. When one of the pull cords 46 in this building structure, for example, that shown in FIGURE 3, is pulled sufficiently to withdraw the latch pin 38 from the transverse aperture 36 in the locking cone 32 shown in that view, the inherent resilience of the lateral extensions 22 and 26 of the elongated connecting members 10 and 12 will cause the lateral extensions to spring apart thereby disengaging locking cone 32 from the grommeted aperture 34 in the wall section 74. Due to the tension or stress generated in the opposed wall sections 74 and 76 as a result of the pressure necessary to keep the building structure erected, a substantially instantaneous parting or separation of the slide fastener stringers 80 and 82 in both directions from the region bridged by the releasable connection will occur upon release of the aforesaid locking cone 32. It is to be understood that only one of the locking cones 32 need be released to start this quick separation, and release of either of the two cones 32 in a releasable connection will suffice for this purpose.

It is also to be noted that the adjacent wall sections 74 and 76 could be connected together by two slide fasteners running in opposite directions from a starting point in the region of the releasable connecting members 10 and 12 and a single slide fastener could be used for this purpose running from end to end of the parting line between the adjacent wall sections 74 and 76. In the latter event, a few of the claws or teeth in the region in which it is desired to have parting commence should be ground down, or cutoff, as indicated at 90 in FIGURE 5, so that the two stringers 92 and 94 therein shown could not interlock along this short portion of their length. Thus when the releasable connection holding the adjacent wall sec-

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tions together in this region is released, the slide fastener stringers 92 and 94 are free to separate or part in opposite directions from the region of the cut off teeth 90. It should be understood that in the modified slide fastener of FIGURE 5, channel shaped members (not shown) but similar to members 14 and 16 of FIGURE 1, engage the outside edges of the stringers 92 and 94.

Since the modification disclosed in FIGURES 6 and 7 operates upon the same principle as does that disclosed in FIGURE 1, the manner of separation thereof should be obvious and will not be described in detail.

While a preferred embodiment of the invention has been shown and described, it will be apparent that variations and modifications thereof may be made without departing from the underlying principles of the invention. For example, projections of other shapes than conical could be used in place of the locking cones 32. It is desired, therefore, by the following claims, to include within the scope of the invention, all such variations and modifications by which substantially the results of the invention may be obtained through the use of substantially the same or equivalent means.

We claim:

1. A releasable connection for use in conjunction with a slide fastener to adapt the same for substantially instantaneous end-to-end parting without the aid of a slider, comprising a pair of elongated connecting members, transversely apertured locking cones adjacent the extremities of one of said connecting members, the other of said connecting members having sockets located and dimensioned to receive said cones, and latches projectable into the transverse apertures in said cones to lock said cones and sockets against separation, said connecting members each having a rigid intermediate portion and lateral leaf spring-like extensions bowed to urge the extremities of said extensions toward positions in opposed spaced relation to each other when said connecting members are disposed in operative relationship so that the said extension must be flexed to bring said locking cones into engagement with said sockets sufficiently to cause said bowed extensions to spring a cone and socket apart with a snap-like action when the latch locking the said cone and socket against separation is retracted.

2. A releasable connection as defined in claim 1 wherein the said intermediate portions of said connecting members are of channel shape in transverse section and are arranged to bring the open sides thereof into opposed relation when said connecting members are locked in operative relationship by said cone and socket connections.

3. The combination with a wall construction including separable sections connected together by a completely separable slide fastener having opposed stringers, of a connection releasably to hold the opposed stringers in said slide fastener at positions at which interlocking of the same may be effected by a slider and to free the same and said wall sections for quick parting when said connection is released, comprising a pair of connecting members having intermediate parts to straddle opposite sides of said slide fastener stringers in the area in which quick parting is to commence so as to sandwich the same therebetween and extensions projecting laterally relative to said intermediate parts, transversely apertured locking cones on the lateral extensions on one of said connecting members, sockets located in lateral extensions on the other of said connecting members located and dimensioned to receive said cones when said connecting members are disposed in close sandwiching relation to said slide fastener, said separable sections having apertures located and dimensioned to receive said cones when said connecting members are in the aforesaid closely sandwiched relation, and latches to project into the transverse apertures in said locking cones for locking the same against separation from said sockets, at least the lateral extensions on said connecting members being biased to spring a cone and socket apart when the latch locking

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the same against separation is retracted thereby releasing said connecting members from straddling relation to said slide fastener stringers so that said stringers are then free to separate substantially instantaneously from end-to-end.

4. The combination defined in claim 3 wherein the intermediate parts of said connecting members are channel shaped and substantially completely encompass the intermediate portion of said slide fasteners when said connecting members are locked in sandwiched relation.

5. The combination with a wall construction including separable sections connected together by a completely separable slide fastener having opposed stringers, of a connection releasably to hold the opposed stringers in said slide fastener at positions at which interlocking of the same may be effected by a slider and to free the same and said wall sections for quick parting when said connection is released, comprising a pair of connecting members having intermediate parts to straddle the opposite sides of said slide fastener stringers in the area in which quick parting is to commence so as to sandwich the same therebetween and extensions projecting laterally relative to said intermediate parts, transversely apertured locking cones on the lateral extensions on one of said connecting members, sockets in the lateral extensions on the other of said connecting members located and dimensioned to receive said cones when said connecting members are brought into closely sandwiched relation, latches to project into the transverse apertures in said locking cones for locking the same against separation from said sockets, at least the lateral extensions on said connecting members being biased to spring a cone and socket apart when the latch locking same against separation is retracted thereby releasing said connecting members from straddling relation to said slide fastener stringers so that the said stringers then are free to separate substantially instantaneously from end-to-end, and pulls for retracting said latches from locations remote from said connecting members, said separable sections having apertures therein through which said pulls extend to guide the same outwardly of the connecting members.

6. The combination defined in claim 5 wherein separate apertures are provided in said separable wall sections for each of said pulls and the said apertures are located to guide said pulls outwardly in opposite directions from said connecting members.

7. A releasable connection for use in connection with a slide fastener to adapt the same to substantially instantaneous end-to-end parting without the aid of a slider, comprising a pair of elongated connecting members, said members each having a substantially rigid and fixed intermediate portion and a pair of oppositely directed extensions, at least one pair of said extensions being individually movable relative to its intermediate portion toward and away from the other pair of extensions, a locking cone fixed to each extension of one pair of extensions and extending therefrom toward the other pair of extensions, each cone being formed with a transverse aperture therethrough, said last named extensions being formed with sockets located and dimensioned to receive said cones therein, latches projectable into and retractable from said apertures of said cones for respectively locking said cones in said sockets and releasing the same for withdrawal therefrom, and means biasing at least one of said pairs of extensions in directions to separate said cones and sockets in substantially instantaneous response to retraction of said latches from said cones.

8. A releasable connection as defined in claim 7, wherein at least said biased pair of extensions is formed of resilient material, and said means biasing such extensions being generated by the flexure which must be imposed upon such extensions to seat said cones in said sockets.

9. A releasable connection as defined in claim 7, there being hinge means hingedly connecting at least said biased pair of said extensions to their fixed intermediate portion,

and torsion springs operatively connected to said hinged extensions to provide said means biasing the same in cone and socket separating directions.

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