

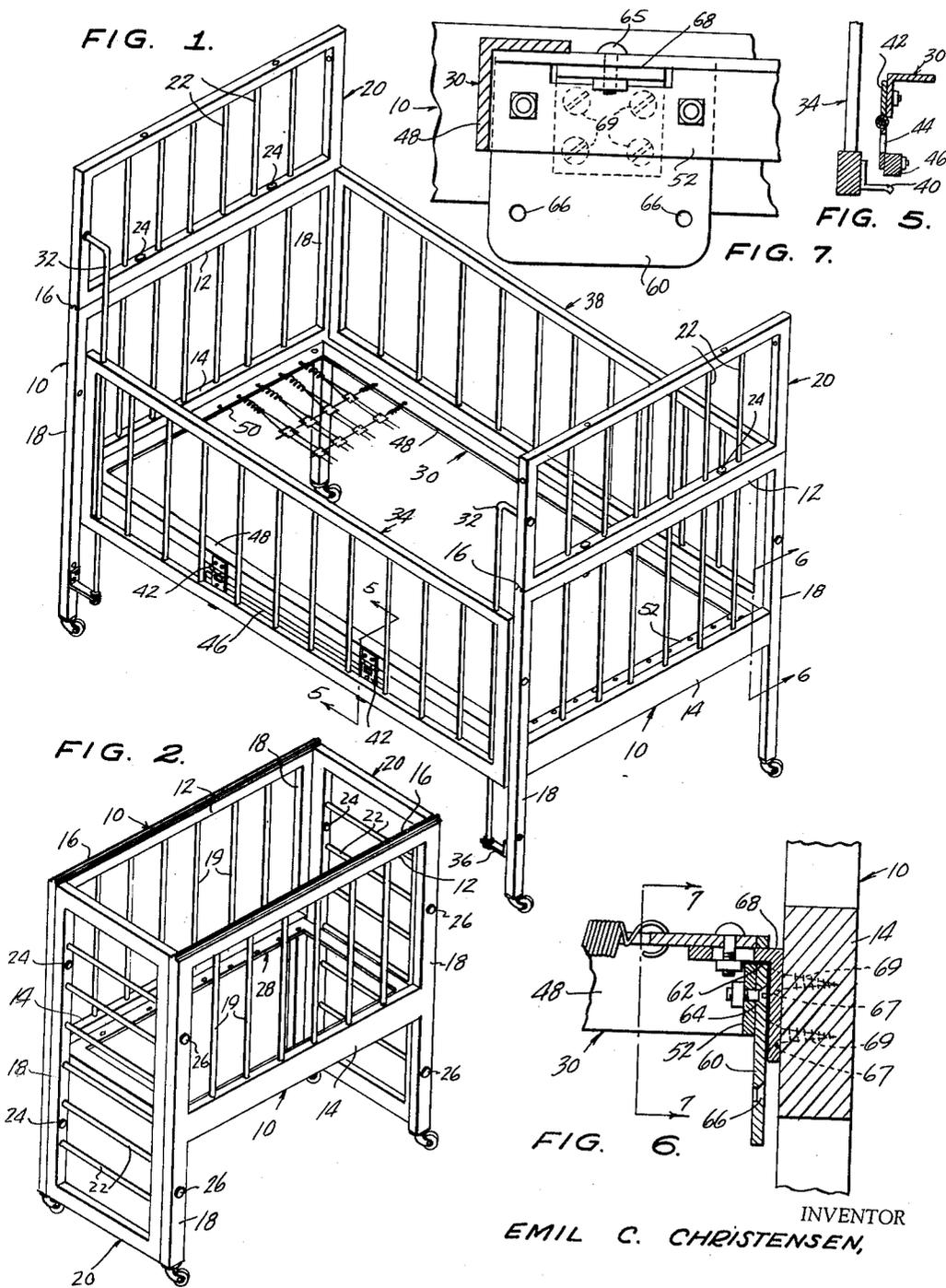
May 11, 1954

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CONVERTIBLE BED

2,677,832

Filed Sept. 14, 1951

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

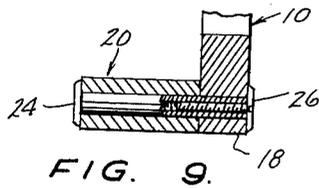


FIG. 9.

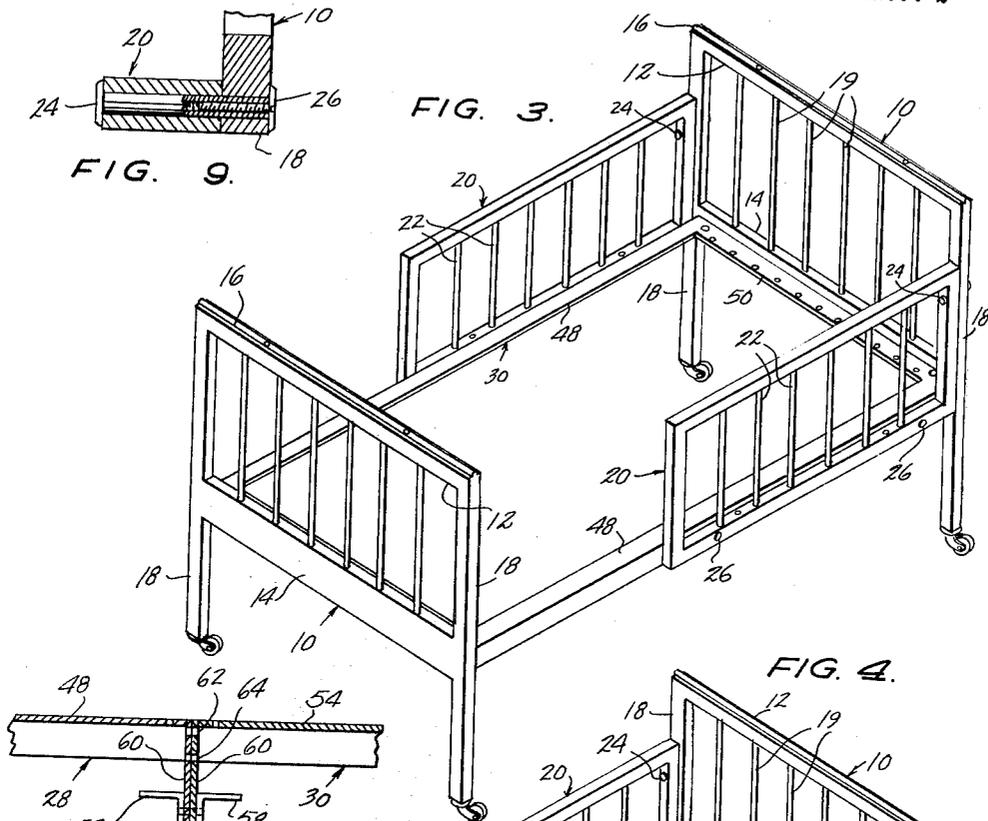


FIG. 3.

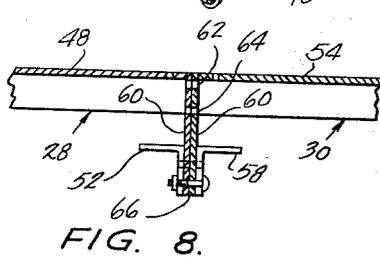


FIG. 8.

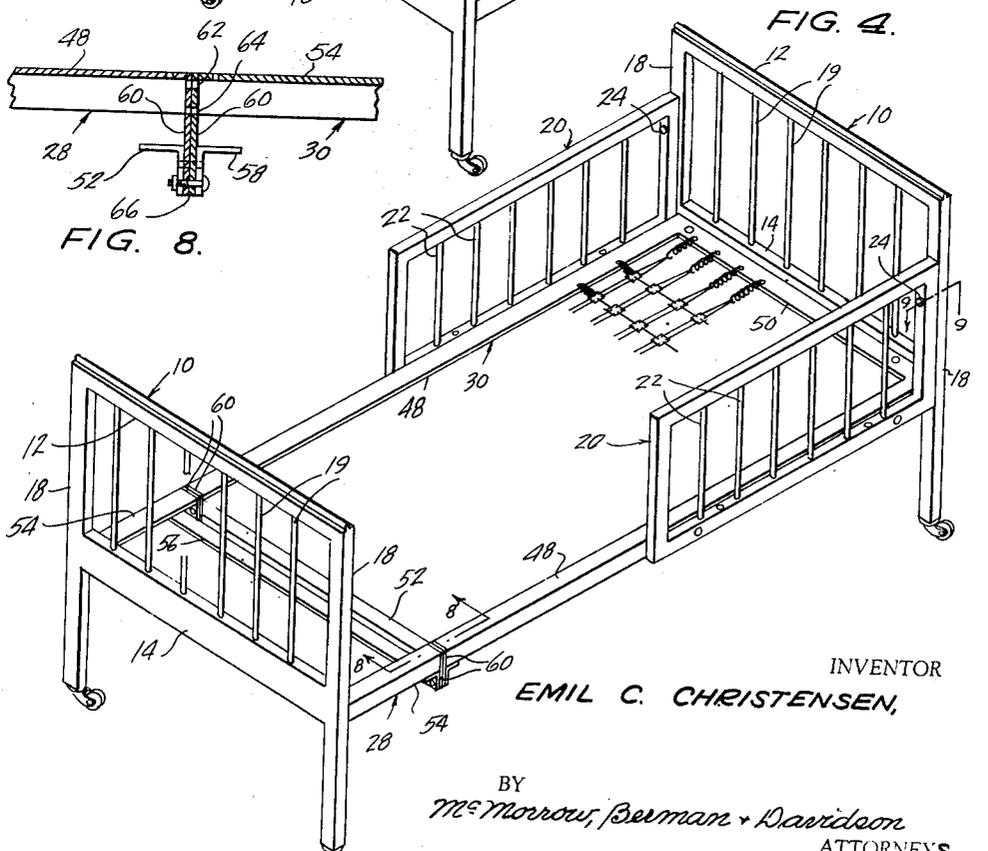


FIG. 4.

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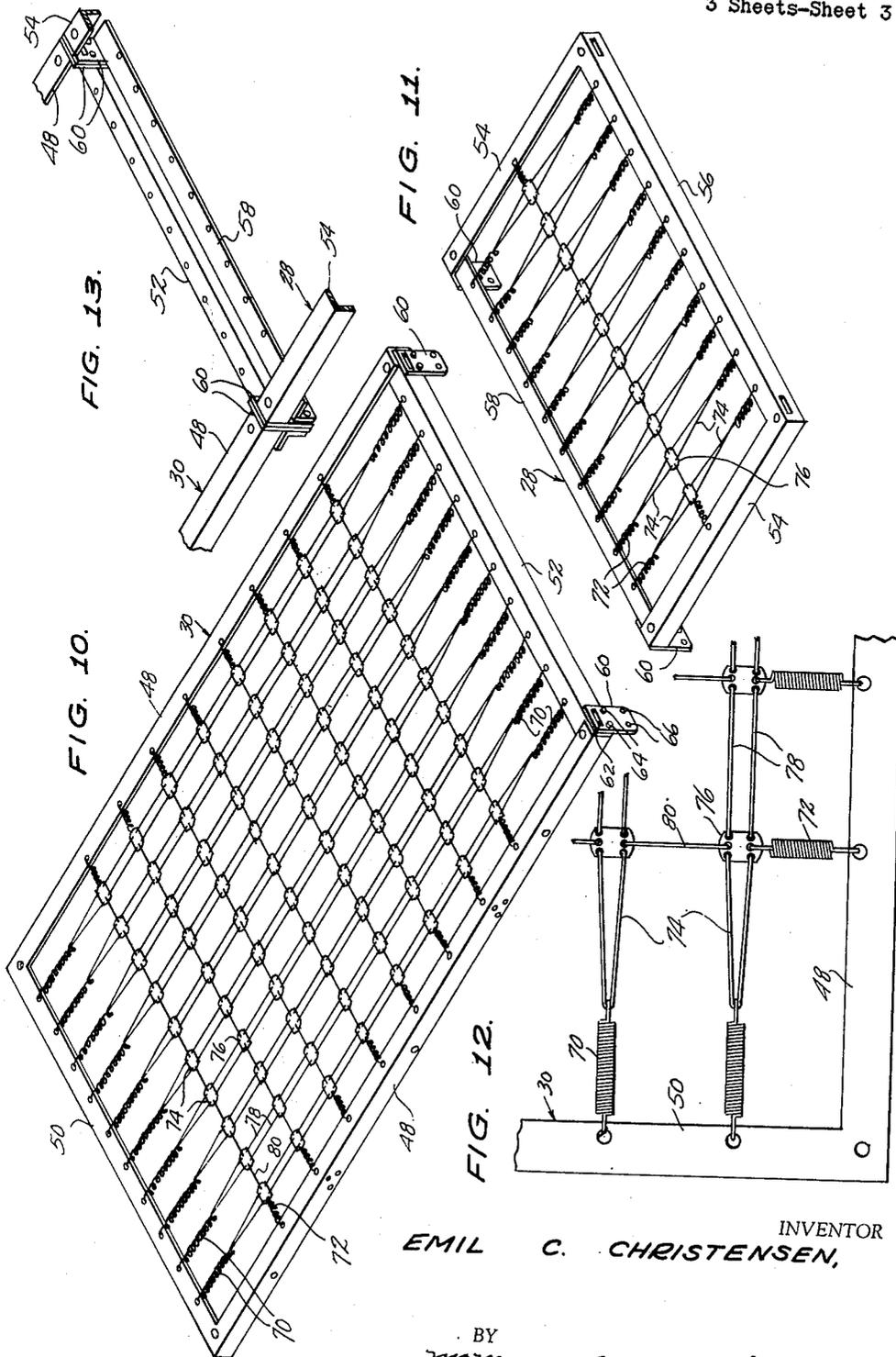
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UNITED STATES PATENT OFFICE

2,677,832

CONVERTIBLE BED

Emil C. Christensen, Burlington, Iowa

Application September 14, 1951, Serial No. 246,624

3 Claims. (Cl. 5-93)

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This invention relates to bed construction. More particularly, the invention has reference to a bed convertible into a bassinette, a baby bed or crib, a junior bed, and a youth bed respectively.

Beds of various types and sizes have been devised for use by children. However, except perhaps to a limited extent, these have not been convertible. As a result, it is customary to purchase, at different stages during a child's growth, a bassinette, a baby bed or crib, a youth bed, a junior bed, and a conventional bed, in the order named. Oftentimes, due to the expense involved, one or more of these is dispensed with, with an attendant sacrifice in the comfort and safety of the child.

In view of the above, it is believed to be clearly desirable that a bed construction be devised that will be so designed as to permit use thereof initially as a bassinette, after which, at different stages during the child's growth, the bed can be convertible successively to a crib, youth bed, junior bed, and in many instances, a conventional bed having no side guards or the like.

It is the main object of the present invention to provide a bed construction convertible in this manner.

Another important object is to provide a convertible bed as described which can be sold at relatively low cost, considering the fact that the bed is usable for accommodating a child from infancy.

Another important object is to provide a bed as stated, wherein the conversions can be effected with ease by the purchaser, whenever desired.

Still another important object is to provide a bed of the type stated which, in each of the forms to which it is converted, will be attractive in appearance and efficient in respect to the manner in which it discharges its intended functions.

Yet another object is to provide, in a bed of the character described, a spring construction wherein a pair of spring frames are separably but rigidly connectible to one another, to increase the overall length of the bed spring embodied in the bed, each of said spring frames being usable independently of one another, in different forms to which the bed is converted.

Still another important object is to provide a spring construction wherein the mattress-supporting portion of the spring, that is mounted upon the spring frame, is novelly designed in a manner to provide a particularly effective support for the mattress, while yet affording full comfort to the user, said mattress-supporting

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portion of the bed spring being novelly designed to impart thereto the characteristic of ruggedness and efficiency in respect to the discharge of its assigned functions.

A still further important object is to provide a bed construction of the type stated which will be so designed as to lend itself readily to commercial construction methods, and which further will be so designed as to permit its manufacture at relatively low cost.

Another object is to provide a bed as stated which will be designed in a manner to permit its being manufactured and shipped in a knock-down arrangement, thus to reduce the cost of shipment.

Other objects will appear from the following description, the claims appended thereto, and from the annexed drawings, in which like reference characters designate like parts throughout the several views, and wherein:

Figure 1 is a perspective view of one form to which the structure constituting the present invention is convertible, said form comprising a baby bed or crib, the mattress-supporting portion of the spring being shown fragmentarily;

Figure 2 is a perspective view of a bassinette conversion form;

Figure 3 is a perspective view of a junior bed;

Figure 4 is a perspective view of a youth bed;

Figure 5 is a detail sectional view taken substantially on line 5-5 of Figure 1, showing a means embodied in the invention for holding the slidable bed guard of the crib illustrated in Figure 1 in elevated position;

Figure 6 is an enlarged detail sectional view, taken on line 6-6 of Figure 1 and illustrating the means whereby the bed spring is connected to one of the end frames;

Figure 7 is a detail sectional view, taken on the line 7-7 of Figure 6;

Figure 8 is an enlarged detail sectional view taken on line 8-8 of Figure 4, showing the means whereby the spring frames are rigidly connected to one another;

Figure 9 is a detail sectional view, on an enlarged scale, taken on the line 9-9 of Figure 4 and illustrating the means for attaching one of the conversion frames to its associated end frame;

Figure 10 is a perspective view of a large spring frame formed in accordance with the present invention;

Figure 11 is a perspective view of a smaller spring frame, formed in accordance with the present invention;

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Figure 12 is an enlarged fragmentary plan view of the spring frame of Figure 10; and

Figure 13 is a fragmentary perspective view illustrating the spring frames of Figures 10 and 11 as they appear when rigidly connected to one another to extend the overall length of the spring.

Referring to the drawings in detail, Figures 1, 2, 3, and 4 show different types of beds which can be constructed, using component parts of the invention. Considering these in the order in which they would be normally used during the growth of a child, reference should first be had to Figure 2.

In Figure 2, there is illustrated a bassinette which includes a pair of end frames generally designated 10. The end frames 10 are disposed in vertical planes, and are formed with rectangular upper portions formed as open frames. The upper portion of each end frame 10 includes a horizontally extended top rail 12, extending from side to side of the frame, and arranged in spaced, parallel relation to a bottom rail 14. At their opposite ends, the top rail 12 and the bottom rail 14 are integrally or otherwise rigidly connected to vertically extended side rails 18, that extend downwardly below the bottom rail 14, to provide a pair of vertical, parallel legs, which can be equipped with casters or the like if desired.

Formed on the top surface of the top rail 12, and extending fully from end to end of said top rail, is a longitudinal tongue 16. The purpose of the tongue 16 will be explained in detail hereinafter, in the description of the baby bed or crib illustrated in Figure 1.

Extending between the top and bottom rails, and spaced longitudinally of said rails, are vertically extended, parallel slats 19. Obviously, the particular configuration of the slats could be varied as desired, and in fact, if desired the open rectangular upper frame portions of the end frame 10 can be solidly formed, rather than formed with the slats 19.

When assembled to provide the bassinette illustrated in Figure 2, the end frames 10 are spaced apart rather closely, through the provision of intervening conversion frames, generally designated 20, and formed in the present instance as open rectangular frame members slatted in the manner referred to above in the description of the end frames 10, through the provision of parallel slats 22.

In assembling the bassinette, the conversion frames 20 are vertically disposed, extending between opposite ends of the respective end frames 10, and are set on end. Then, opposite sides of the conversion frames are fixedly connected to the end frames associated therewith, through the provision of a connecting means shown in detail in Figure 9. This connecting means includes a female bolt 24, interiorly threaded to receive the threaded male bolt 26, said bolts extending between registering openings formed in the conversion and end frames, so as to separably but rigidly connect the frames. In this connection, the bolts 24 and 26 each have flat ornamental heads, and are usable either vertically or horizontally to connect, for example, frame 10 to 20, or frame 20 to a spring frame 30 to be described hereinafter. The end and conversion frames, it should be noted, are of equal thickness throughout, so far as the material of their component parts is concerned.

In forming the bassinette, a small spring frame generally designated 28, and illustrated in Figure 11, is used. The construction of the spring frame

228 will be covered in detail hereinafter, but it will suffice to state at this time that the spring frame is of rectangular outer configuration, and is proportioned to fit snugly in the rectangular space defined by the coacting end frames 10 and conversion frames 20. The end frames are connected directly to opposite sides of the spring frame 28, said end frames being provided with brackets to be described hereinafter, that have tongues to which the spring frame is bolted, so that the completed bassinette conversion form is possessed of a high degree of rigidity and strength, while yet being small and compact in size, so as to accommodate with comfort a newly born infant.

In Figure 1 there is illustrated a baby bed or crib, and in assembling the baby bed, a larger spring frame generally designated 30 is used, instead of the frame 28. The opposite ends of the spring frame 30 are bolted directly to the end frames 10, said opposite ends of the frame 30 being bolted to the aforementioned tongues, and the conversion frames 20 are positioned directly upon the top edges of the end frames. In this connection, the conversion frames 20 are each formed, along one longitudinal edge thereof, with a groove complementary to the tongue 16, so as to interengage the top rail 12 of each end frame 10 with one side of the conversion frame. Thereafter, the cooperating male and female bolts 24, 24 are extended through registering openings formed in the conversion frames and end frames respectively, to secure the frames rigidly but separably to one another in superposed relation, while in a common vertical plane.

After the conversion frames have been attached to the top edges of the end frames in the manner illustrated in Figure 1, guide rods 32 are secured at their upper ends to the conversion frames, at one side of the baby bed or crib. The guide rods 32 are of inverted L-shaped formation, having short laterally extended legs at their upper ends, which preferably have threaded male ends engaged by female bolts such as the bolts 24. At their lower ends, the guide rods 32 are connected to laterally extended angle brackets 36, that are screwed to the lower end portions of the legs of the end frames 10.

Prior to connecting the guide rods to the conversion frames, the guide rods are passed through vertically aligned openings formed in opposite ends of a bed guard 34, of elongated, rectangular configuration. Preferably, the bed guard 34 is of vertically slatted construction, so as to be in harmony with the conversion and end frames.

When slidably adjusted downwardly upon the guide rod 32, the bed guard 34 is engaged by the brackets 36, to limit downward movement thereof. Obviously, it is desirable that the bed guards be held in a raised position, when slid upwardly upon the guide rods, so as to be aligned horizontally with a fixed side frame 38 extending along the opposite side of the baby bed or crib, and bolted through the medium of the male and female bolts described above, to the end frames 10.

As a means for holding the bed guard 34 in raised position, I provide a construction particularly well shown in Figure 5. Spaced longitudinally of the lower longitudinal edge of the bed guard 34 are angle brackets 40, secured to the inner surface of the bed guard, and extending laterally in the general direction of the spring frame 30. A pair of hinges 42 is provided upon the adjacent side of the spring frame 30, each of said hinges having an upper hinge member

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bolted rigidly but separably to the spring frame, and a free swinging lower hinge member having a slot 44 proportioned to receive a laterally extended portion of the associated angle bracket 40.

For joint operation of the swinging portions of the hinges 42, there is provided an elongated connecting bar 46 extending between the hinges 42, in parallelism with the adjacent side of the spring frame 30. At its opposite ends, the bar 46 is bolted or otherwise rigidly connected to the swinging portions of the hinges, and thus, when the bar 46 is swung inwardly, the hinges are positioned to receive the laterally projected portions of the brackets 40, thus to hold the bed guard 34 in raised position. Obviously, to lower the bed guard, it is necessary merely that the user again swing the bar 46 inwardly, so as to disengage the brackets 40 and permit the bed guard to gravitate to its lower position.

It is believed sufficiently obvious as not to require special illustration that coil springs, not shown, can be provided upon the lower ends of the guide rods 32, to cushion the fall of the bed guard.

Referring now to Figure 3, there is here illustrated a junior bed, such as is often used when the child has grown beyond the crib stage, but is still believed to be too young to use a conventional bed having no side guards. To form the junior bed from the baby bed or crib illustrated in Figure 1, it is necessary merely to remove the conversion frames from their position above the end frames 10, and dispense with the side frame 38, the bed guard 34, the guide rods 32, and the means described immediately above attachable to the spring frame 30 for the purpose of holding the bed guard in elevated position.

After the conversion frames have been so removed, they are secured in the positions illustrated in Figure 3. In these positions, the conversion frames abut at one end against one of the end frames 10, and are secured to said end frame by means of coacting male and female bolts 26, 24. Similar bolts are used to connect the lower longitudinal edges of the conversion frames directly to the opposite side rails of the spring frame 30, said side rails of the spring frame being designated 48 and being integral or otherwise rigid at one end with a transversely extended head rail 50.

In this way, a junior bed is formed which provides ample protection against the child's falling from bed.

Referring to the conversion form illustrated in Figure 4, there is here illustrated a youth bed, which is similar in most respects to the junior bed illustrated in Figure 3, except for being substantially longer. It is advisable to convert from a junior bed to a youth bed as the child grows, so as to provide a bed sufficiently long to accommodate the growing child, while still providing the desired protection against the child's falling out of the bed while sleeping.

To this end, the spring frame 30 is provided at one end with a movable foot rail 52. When the spring frame 30 is being used in a baby bed (Figure 1) or in a junior bed (Figure 3), the foot rail 52 is elevated until it is in the same plane as the fixed head rail 50, the foot rail being illustrated in this position in Figure 10.

However, to form the longer youth bed, the overall length of the bed spring must be increased, and it is advisable to lower the foot rail 52 relative to the remaining parts of the spring frame 75

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30, and connect it rigidly in its lower position to a cooperating foot rail formed to substantially the same length as the foot rail 52. The cooperating foot rail is mounted upon the bed frame 28.

In this connection, the bed frame 28, though smaller in size than the frame 30, is of the same general construction, having parallel side rails 54 rigid at one end with a transversely disposed end rail 56. The other end rail 58 of the frame 28 is, in one position thereof, secured to the adjacent ends of the side rails 54, in a plane common with the end rail 56. However, in another position of the rail 58, said rail is lowered as illustrated in Figure 8.

Those ends of the spring frames 30 and 28 respectively having the shiftable end rails 52 and 58 are provided with depending connecting plates 60 each of which is formed adjacent its upper end with a transverse slot 62, each of said plates being also formed with vertically spaced pairs of openings 64 and 66 respectively. The plates 60 are welded or otherwise rigidly connected to the contiguous ends of the rails 48 or 54 as the case may be, in confronting relationship with one another, as readily seen from Figure 8.

When the rails 52 and 58 are to be secured in their upper positions, bolts are passed through the upper series of openings 64, after said openings have been brought into registry with complementary openings formed in the rails 52 and 58.

If, however, the rails 52 and 58 are to be lowered, the openings in said rails are brought into registry with the lower pair of openings 66 of the plates 60, and bolts are extended through the registering openings to secure the rails 52 and 58 in their lowered positions. The securing bolts, in this connection, pass not only through the plates 60, but through both of the rails 52 and 58, so as to not only rigidly connect the side rails of the spring frames to one another in end to end relation, but also to connect the dropped rails 52 and 58 with complete rigidity.

The means for securing either the spring frame 30 or the smaller spring frame 28 to the end frames in forming the bassinette, baby bed, the junior bed, or youth bed is illustrated in Figure 6, and from this figure, and also from Figure 7, it may be noted that the plate 60 receives the laterally extended tongue of an angle bracket 68, having a depending leg provided with four countersunk openings 67 through which screws 69 extend, said screws extending into the inner surface of the bottom rail 14 of the end frame. Said laterally extended tongue of the angle bracket 68 extends through the slot 62 of the plate 60, which slot registers with a longitudinal slot formed in the rail 52 or 58, as the case may be, when said rail 52 or 58 is elevated to its upper position. Bolts 65 are used to connect the laterally extended tongue of the bracket 68 directly to the rails 50 or 52 (on spring frame 30) or to rails 56 or 58 (on spring frame 28) as the case may be, said rails 50 and 52, or 56 and 58 having bolt-receiving openings coinciding with the bolt-receiving openings of the bracket tongues.

Considering now the formation of the respective spring frames 30 and 28, reference should be had to Figures 10 and 11. Each rail of the spring frames 30 and 28 is provided with openings receiving the outer ends of elongated coil springs 70, the ends of said coil springs 70 being hooked through the openings and the springs being arranged in parallel relation, extending longitudinally

nally of the spring frame in which they are mounted.

Shorter transverse springs 72 are hooked at one end through openings formed in the side rails of the respective spring frames.

Referring to Figure 12, V-shaped end links 74 of stout wire material are engaged intermediate their ends with the inner ends of the spring 70. The ends of said V-shaped end links are hooked into small, flat plates 76, each of which is formed with a plurality of openings arranged in a marginal series upon said plates.

Intermediate links 78 extend longitudinally of the respective spring frames, and connect longitudinally spaced, adjacent plates 76. Each intermediate link 78 is formed from a single length of wire material, having hook-shaped ends, and a pair of intermediate links extends between each pair of longitudinally spaced plates 76.

Transverse links 80 are each formed of a single length of material having hook-shaped ends, and are disposed transversely of the spring frame, so as to connect the plates 76 in transversely spaced relation.

This construction is carried out throughout the spring frame area, as may be noted from Figure 10, thus to provide a desirable resilient and strong mattress-supporting portion on each of the spring frames.

Whenever both spring frames are to be used in end to end relationship, as for example in forming the youth bed of Figure 4, the end rails 52, 53 are dropped. However, so that there will be no depression intermediate the opposite ends of the bed spring defined by the coacting frames 33 and 23, the springs 70 and 72 are disengaged from the rails 52 and 53 respectively, and are hooked directly to one another.

From the above, I believe that it will be obvious that a bed construction is illustrated and described, which permits the manufacture of the bed as a knock-down assembly which in turn can be built into a bassinette, crib, junior bed, and youth bed. I believe that it will also be obvious that if desired, the conversion frames 20 can be removed from the youth bed conversion form illustrated in Figure 4, thus to impart to the bed a thoroughly conventional appearance and permit its use as a bed in the regular manner.

It is believed to be an important characteristic of the invention that the entire assembly can be manufactured at relatively low cost, considering the benefits to be obtained thereby. Heretofore, to my knowledge there has not previously been devised a bed construction wherein the assembly is convertible into the large number of bed types illustrated in the drawings, ranging from a bassinette of small size to a youth bed of substantial size.

Further, it is considered to be an important characteristic of the invention that the conversion can, in each case, be effected by the purchaser with substantial ease and facility, and without the use of special tools. Male and female bolts previously used in holding in rigid relationship component parts of the bed when it is in one form, can be removed and used in assembling component parts of the bed when another form is being constructed. Further, many of the parts of the structure are capable of use in different positions, reference being here made to the conversion frames 20 which in the bassinette form provide elongated, narrow sides, provide upper extensions of the end frames in the crib

form, and provide side guards in the youth and junior bed forms.

It is believed clear that the invention is not necessarily confined to the specific use or uses thereof described above, since it may be utilized for any purpose to which it may be suited. Nor is the invention to be necessarily limited to the specific construction illustrated and described, since such construction is only intended to be illustrative of the principles of operation and the means presently devised to carry out said principles, it being considered that the invention comprehends any minor changes in construction that may be permitted within the scope of the appended claims.

What is claimed is:

1. In an extensible bed construction; a bed spring, a pair of elongated, parallel side rails; an end rail fixedly connected at opposite ends to one end of the side rails and disposed coplanar to said side rails; a second end rail extending between the other ends of the side rails; means for securing the second end rail to said side rails in selected positions of elevation in one of which it is coplanar with the first-named end rail, and in the other of which it is at a level below the plane of said first-named end rail; a plurality of plates arranged in intersecting transverse and longitudinal rows between the respective side rails and end rails; straight links connecting the plates of said transverse and parallel rows; coil springs extending inwardly toward the plates from the side and end rails, those springs extending inwardly from the side rails being connected directly to the plates of the outermost longitudinal rows; and V-shaped links extending from those coil springs extending from the end rails and connected to the plates of the outermost transverse rows.

2. In an extensible bed construction; a pair of upstanding end frames arranged in parallel spaced relation; a bed spring of a size to conformably fit the space between said end frames positioned between said end frames; said bed spring including a first rectangular frame and an extension frame also of rectangular configuration but smaller in size than the first named bed spring frame and projecting from said first rectangular frame in end to end relation; said first rectangular frame embodying a pair of parallel side rails, an end rail fixedly connected at opposite ends to one end of said side rails and disposed coplanar to said side rails, and a second end rail extending between the other ends of said side rails and movably connected to the side rails in selected positions of elevation in one of which it is coplanar with said first named end rail and in the other of which it is at a level below the plane of said first end rail; said extension frame embodying a pair of parallel side rails, a first end rail fixedly connected at opposite ends to one end of said last named side rails, a second end rail extending between the other ends of said last named side rails and movably connected to the side rails in selected positions of elevation in one of which it is coplanar with said last named end rail and in the other of which it is at a level below the plane of said last named end rail; said second end rail of said first rectangular frame and said second end rail of said extension frame being adjacent each other; separable means rigidly interconnecting said two second end rails in their selected positions of elevation; detachable interengaging means on said end frames and the ends of said bed spring frame for connecting said end

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frames and bed spring frame together; an up-
standing frame extending along each of the sides
of said bed spring frame; and separable interen-
gaging means carried by the ends of said frames
and of said end frames for connecting said frames
and end frames together.

3. In an extensible bed construction; a bed
spring comprising a first rectangular frame and
an extension frame also of rectangular configura-
tion but smaller in size than the first rectangular
frame and projecting from said first rectangular
frame in end to end relation, said first rectangu-
lar frame embodying a pair of parallel side rails,
an end rail fixedly connected at opposite ends to
one end of said side rails and disposed coplanar
to said side rails, and a second end rail extending
between the other ends of said side rails and mov-
ably connected to the side rails in selected posi-
tions of elevation in one of which it is coplanar
with said first named end rail and in the other
of which it is at a level below the plane of said
first end rail; said extension frame embodying
a pair of parallel side rails, a first end rail fixedly
connected at opposite ends to one end of said last
named side rails, a second end rail extending be-

tween the other ends of said last named side rails
and movably connected to the side rails in selected
positions of elevation in one of which it is co-
planar with said last named end rail and in the
other of which it is at a level below the plane of
said last named end rail; said second end rail of
said first rectangular frame and said second end
rail of said extension frame being adjacent each
other; and separable means rigidly interconnect-
ing said second end rails in their selected posi-
tions of elevation.

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