No. 844,245. PATENTED FEB. 12, 1907.

E. G. BUDD.

FRAME JOINT.

APPLICATION FILED MAY 26, 1905.

3 SHEETS—SHEET 1.

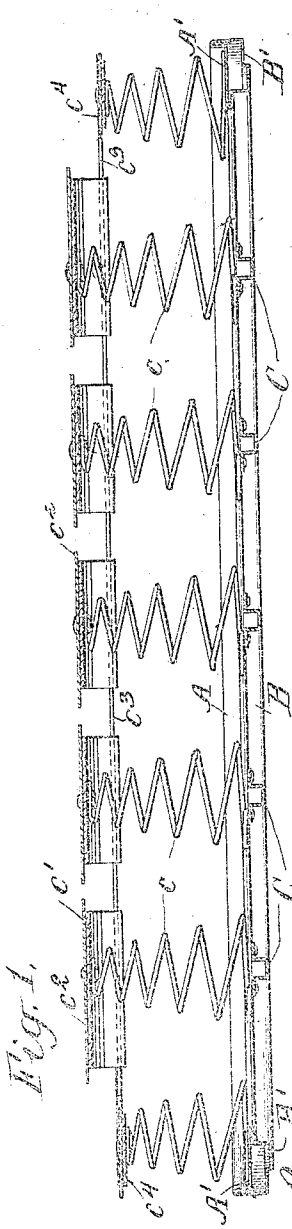


Fig. 1.

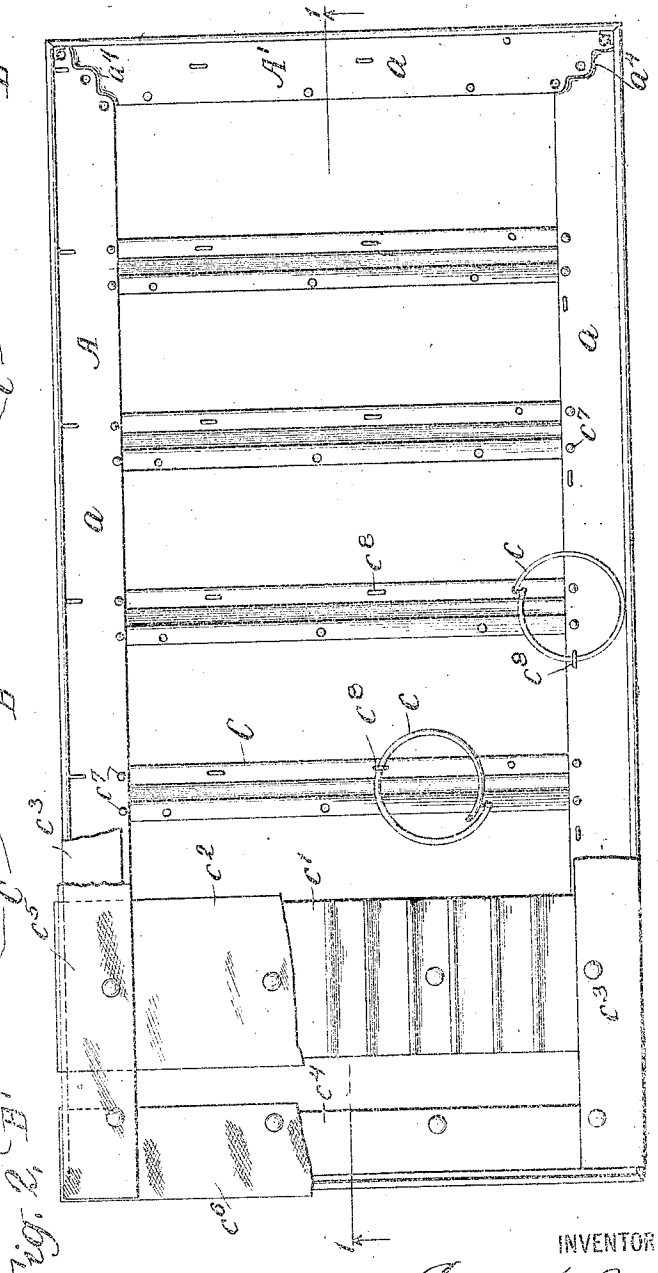


Fig. 2.

WITNESSES:

J. McIntosh

L. Nork

INVENTOR

Edward J. Budd

BY

J. Edmonds

ATTORNEY

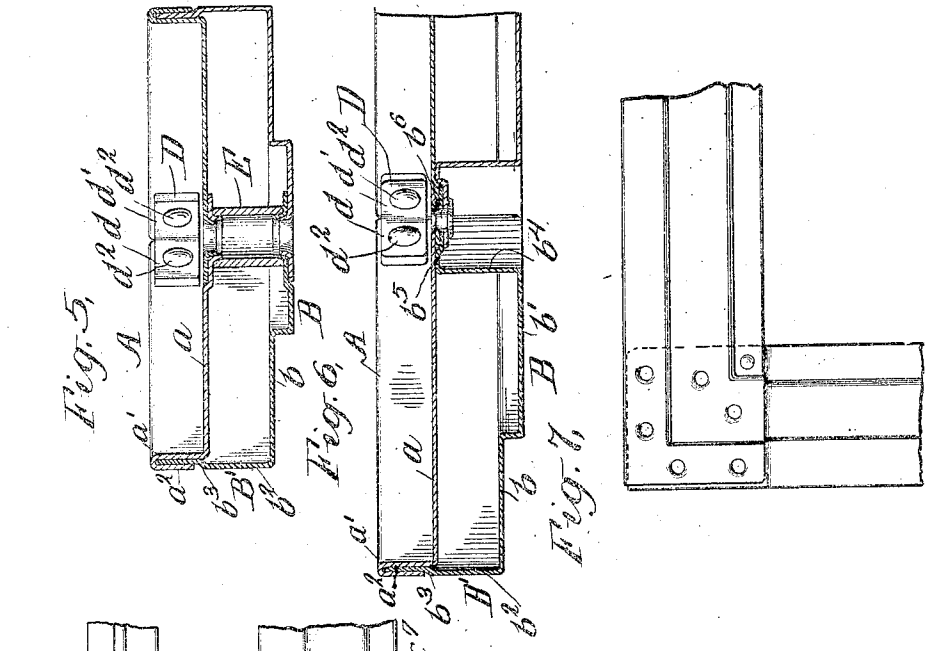
No. 844,245. PATENTED FEB. 12, 1907.

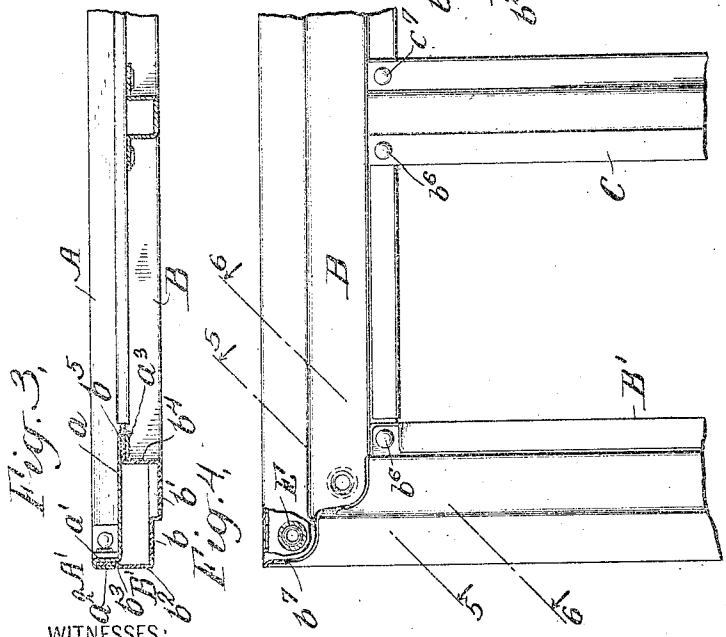
E. G. BUDD.

FRAME JOINT.

APPLICATION FILED MAY 26, 1905.

3 SHEETS—SHEET 2.





WITNESSES:

J. McIntosh

L Nork

INVENTOR

Edward G. Budd

BY

ATTORNEY

No. 844,845. PATENTED FEB. 12, 1907.

E. G. BUDD.

FRAME JOINT.

APPLICATION FILED MAY 26, 1905.

3 SHEETS—SHEET 3.

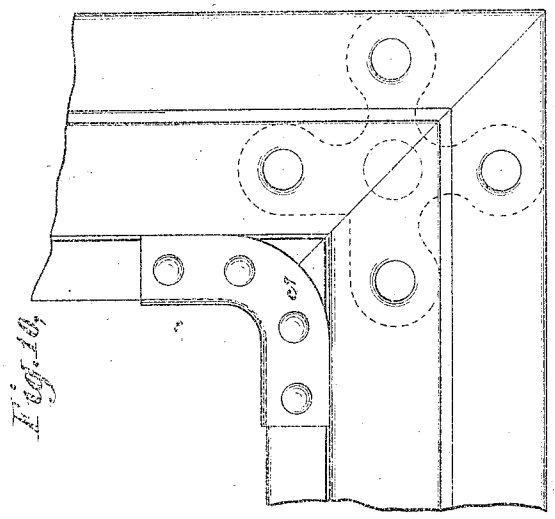


Fig. 1.

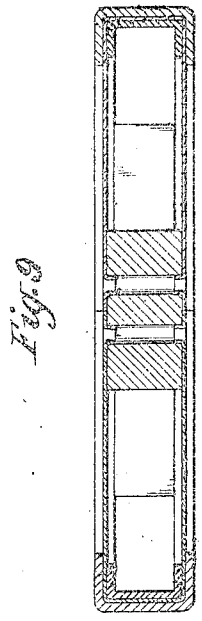


Fig. 2.

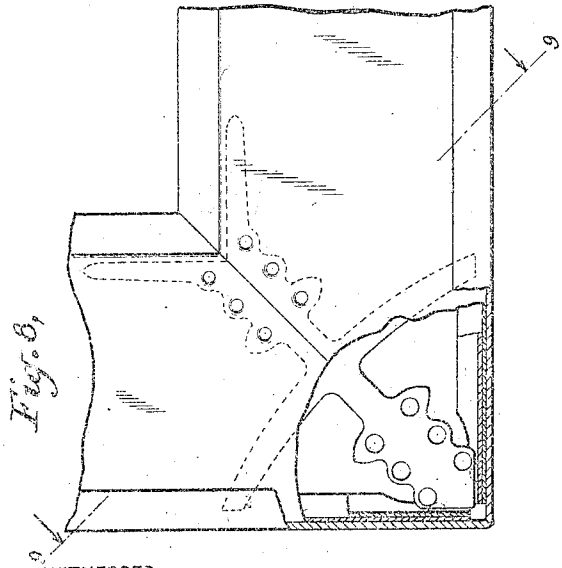


Fig. 3.

WITNESSES:

J. Geo. Intosh

L. York

INVENTOR

Edward J. Budd

BY

J. R. Edwards

ATTORNEY

UNITED STATES PATENT OFFICE.

EDWARD G. BUDD, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HALE-KILBURN METAL COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

FRAME-JOINT.

No. 844,245 Specification of Letters Patent. Patented Feb. 12, 1907.

Application filed May 26, 1905. Serial No. 262,382.

To all whom it may concern:

Be it known that I, EDWARD G. BUDD, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Improvement in Frame-Joints, of which the following is a specification.

The object of the present invention is to provide a joint for the meeting edges of metallic frame parts used in the construction of various articles—as, for instance, car-seats, window and door frames, and the like—which joint shall be of such character as to involve but little expense either of time or labor in its construction, and which shall when in its completed form hold the connected parts rigidly together, making them in practical effect integral.

Speaking generally, I employ in carrying out the invention frames of stamped or pressed steel or other suitable material, each part thereof being made in sections, (preferably two in number where this is practicable,) the abutting edges of such sections being secured together in suitable manner—as, for instance, by flanging the edge of one over the flanged edge of the other—and the adjacent edges of each such sectional frame member are overlapped to form a joint and there secured, preferably by crimping the two thicknesses of metal into separator-sleeves extending between the sections and serving the dual purpose of bracing such sections to prevent collapse and through the crimping of the material into the interior of such sleeves securing the sections thereto and preventing expansion. Any suitable number of such separators may be employed at each joint, varying with the size of the joint and its cross-sectional configuration. A metallic frame so constructed, in addition to being incombustible, possesses the desirable attributes of lightness combined with adequate strength, and also low cost as compared with other structures heretofore devised and even approaching the same ends.

The invention, while capable of utilization for many and diverse purposes, is particularly applicable to the construction of car-seat frames, and such application has been illustrated and will be described herein, without, however, the intent to limit the invention thereto.

In the drawings, Figure 1 is a central longitudinal section of a car-seat frame employing my invention, said section being on the line 1 1, Fig. 2. Fig. 2 is a top plan view of said frame, some of the coil-springs and their overlying spring-bands being omitted. Fig. 3 is an enlarged sectional view of a portion of the frame shown in Fig. 2 a- about the line 1 1 of said last-named figure. Fig. 4 is an inverted plan view of the parts shown in Fig. 3. Fig. 5 is an enlarged section on the line 5 5, Fig. 4. Fig. 6 is an enlarged section on the line 6 6, Fig. 4. Fig. 7 illustrates in plan view a modification in the method of connecting the frame members. Figs. 8 and 9 (the latter being a section on the line 9 9, Fig. 8) illustrate a modification in the separator device; and Fig. 10 illustrates a further modification of said device.

Referring to the drawings, in which similar letters denote corresponding parts, attention is called, primarily, to the fact that the frame proper comprises in the present instance selected for disclosure the upper section A A' and lower section B B', presently to be described in detail, the letters A and B designating, respectively, the upper and lower side members and the letters A' B' designating, respectively, the upper and lower end members of such frame. Extending between and riveted or otherwise secured to both the upper and lower members of each of the side frames are cross-bars C, preferably channeled, as shown in Figs. 1 and 2, upon which are mounted the coil-springs *c*, the upper ends of each lateral series whereof are secured to a spring-band *c'*, preferably of corrugated steel, over which extends a webbing c^2, said webbing preventing the band *c'* from cutting through the superposed upholstery of the seat. The ends of the bands *c'* and webbings c^2 are secured to longitudinal spring-plates c^3, overlying the coil-springs at the ends of each of the transverse series of such springs and to which the upper ends of such coil-springs are secured. Said longitudinal spring-plates are preferably connected at their ends by lateral spring-plates c^4, and

over both the longitudinal and lateral spring-plates c^3 c^4 may extend webbings c^5 c^6, having the same function as the webbings c^2.

The parts as thus briefly described constitute the complete frame structure ready to receive the upholstery by the addition whereof such structure may be finished for use.

Turning now to the construction of the sectional metallic frame more particularly concerned in the present invention, I premise, with the statement that the parts A A′ B B′ are or may be substantially the same in construction, varying in the present instance only with regard to length. The invention is probably best disclosed by Figs. 3 to 6, inclusive, showing these parts on enlarged scale. As here shown, each lower member of the sectional frame is formed of a single sheet, preferably of steel, stamped or pressed to the desired cross-sectional shape. The body portion b may be paneled or ribbed, as shown at b', either for ornamentation or additional strength, and the outer edge b^2 is preferably turned inward near its extremity, as shown at b^3, for coaction with the upper frame member presently to be described. The inner edge b^4 is flanged inwardly at b^5 for similar coaction.

Each upper member A or A′ comprises the body portion a, which may also be ribbed or paneled, if desired, the outer edge a' being perpendicular thereto and the extremity thereof being turned over at a^2 in a line parallel with the portion a', leaving sufficient space between the portions a' a^2 to receive the inwardly-turned edge b^3 of the lower section B or B′ of the frame. The inner edge of the body portion a of the upper section A or A′ of the frame is treated in the same manner as the outer edge, save that it is not turned at an angle thereto. The extreme edge, as shown in Fig. 3, is folded, as at a^3, so as to lie in a plane parallel with that of the body a, leaving sufficient space, however, between the folded edge a^3 and such body to receive the inwardly-extending flange b^5 of the lower section. In practice the channeled cross-bars C are riveted, as shown at c^7 c^7, to these inwardly-projecting edges of the upper and lower sections of the frame, such rivets extending through the portions a^3, b^5, and a, thus binding the same rigidly together. Said rivets will be employed whether the channeled bars C are used or not, as they contribute to the rigidity and stiffness of the structure and oppose rending or distorting strains, causing the connected members to move relatively to each other. Also the staples c^8, whereby the (edge) coil-springs are secured in position, may extend through perforations between the corresponding frame parts extending inwardly from the end members A′ B′ of the frame, thereby aiding in securing such corresponding parts together, or, if desired, for greater strength said parts may be secured together by rivets in place of or in addition to such staples.

Adjacent to the meeting edges of an end section and a side section a portion of the fold a^3 of each of said sections may be cut away, as shown in Figs. 4 and 6, and the flange b^5 of one section overlapped upon the adjacent edge of the corresponding part of the adjoining section, (the latter being preferably slightly depressed,) the two parts b^5 being secured through such overlapped joint by means of a rivet b^6, extending also through the correspondingly-overlapped body portions a of the two adjacent frame-sections. Said rivet may be employed whether the fold be cut away or not, or I may, if desired, utilize for the same purpose U-shaped corner-pieces c^9, as clearly shown in Fig. 10. D designates braces, each having the two members d d' at right angles to each other, and each member being perforated to receive a rivet d^2, whereby such member is secured through the parts a', a^2, and b^3, as best shown in Figs. 3, 5, and 6.

Adjacent to its ends each member of the lower section B B′ of the frame is provided with a lap-joint with its coacting member of such section, the material at the end of one such member being suitably depressed in order to permit the overlap by the end of the other member to lie in the same plane as the main portion of the former. Thus in Fig. 4 I have shown the end member of the lower section B′ as provided with depressions b^7, so arranged as to snugly receive the correspondingly-shaped end of the lower member B of the side section. This description holds true also of the several members of the upper section A A′ of the frame. Thus in Fig. 2 I have shown one of the side members A as provided with depressions a^4, coacting with correspondingly-shaped portions at the end of the upper member A′. At the other corner (shown in Fig. 2) this is reversed, the depressions being formed in the upper end member A′ and coacting with similarly-shaped portions at the end of the upper side member A. The overlapping portions of the members A A′ of the upper section of the frame and the overlapping portions of the members B B′ of the lower section of the frame are thus arranged one directly above the other, and the same securing device, now to be described, attaches together not only the respective members of the upper section and the respective members of the lower section, but also the upper and lower sections. Thus (see particularly Fig. 5) E designates a separator-sleeve or section of tubing of such length as to abut against the adjacent faces of the upper and lower sections between the overlaps formed in those sections and just described. After the separator has been placed in this position the material of each of the overlaps is secured thereto either by a

bolt or rivet passing through such material and separator-sleeve or by swaging or crimping such material into such sleeve. I prefer and have illustrated herein the latter method, which may be followed with respect to each of said overlaps separately by means of a suitable tool, such as a punch, the material of the overlap forming part of the upper section A A′ being thereby forced into the interior of the sleeve and the frame then turned over, and the material of the overlap forming part of the lower section B B′ correspondingly forced into the interior of such sleeve, or, if desired, the upper and lower sections may be placed together, the separators E in proper position, and the whole frame laid over a suitable anvil containing a projecting stud or die, a corresponding stud or die being placed over the overlap forming part of the upper section and pressure applied, whereby the same result will be accomplished. This may be done either before or after the use of the rivets b^6 or of the braces D, the particular sequence observed being of minor importance.

In Figs. 8, 9, and 10 I have illustrated a modification of the separator structure above described, which, however, operates in the same manner not only as a securing medium which additionally holds the frame-sections together, but also as a brace preventing collapse. Thus, as shown in Fig. 10, a casting may be placed between the frame-sections at the corners, such casting having a plurality of orifices which may receive bolts passing therethrough and through the frame material or into which such material may be swaged or crimped. In Figs. 8 and 9 this separator-casting takes somewhat different form and is provided additionally with outwardly-extending arms whereby the separator is effective throughout a greater space between the frame-sections, bracing the same apart and greatly contributing to the strength and rigidity of the structure.

It will be obvious that the invention is not limited to the specific details herein described and that the structure specifically disclosed may be departed from within wide limits without sacrifice to the advantageous features of the invention. Thus, as an instance, it is not essential that the members of every section be provided with an overlap involving a depression in the end of one for coaction with the end of the other, nor is the particular shape or configuration of the adjoining ends of two members of either section as herein described essential, an obvious departure from this being shown in Fig. 7. Indeed, the construction shown in said figure may be preferable where the frames are of considerable size and additional strength at the joints thereof is required, it being possible to employ a larger number of separators or one of greater size and strength in this case and to swage or crimp the material of the frame members into these by any suitable method—as, for instance, one of the two hereinabove specified. Also I desire it to be understood that the invention is not limited to the use of the securing devices herein described only at the joints between the several members of the frame, as I may, if desired, secure greater rigidity intermediate of the ends of the members by employing such securing devices at other points, particularly where, for instance, in the construction of a door-frame of considerable size it becomes desirable to attach and secure together any two parts at suitable intervals.

Having now described my invention, what I claim as new therein, and desire to secure by Letters Patent, is as follows:

1. In a joint, the combination with two overlaps, of a separator between such overlaps, the material of said overlaps extending into said separator, substantially as set forth.

2. In a joint, the combination with two overlaps, of a separator between said overlaps, the material of each of said overlaps being driven into said separator, substantially as set forth.

3. In a joint, the combination with two adjoining frame-sections, each comprising two members, the edges of the members of one section overlapping the edges of the members of the other section, of a separator between the overlaps of said sections, the material of both sections extending into said separator, substantially as set forth.

4. In a joint, the combination with frame members lying in substantially parallel planes and having their ends cut to form overlapping portions, of a separator between said portions, the material of the latter extending into said separator, substantially as set forth.

5. In a joint, the combination with frame members lying in substantially parallel planes and having their ends cut to form overlapping portions, of a series of separator-sleeves between said portions, the material of the latter extending into said sleeves, substantially as set forth.

6. The combination of two frame-sections each comprising two members one having a flange at its edge and the other having a flange of U-shaped cross-section inclosing the first-named flange and means securing said flanges together, said sections having their ends cut to form overlapping portions, and a separator between said ends, the material of said portions extending into said separator, substantially as set forth.

7. The combination with a sectional frame, each section having several members, of flanges formed at the edges of the members of one section and coacting with the edges of the members of the other section, and braces secured to the flanges of the members of one section and to the edges of the

members of the other section, substantially as set forth.

8. The combination of a rectangular frame formed of a plurality of frame-sections secured together, each of said sections consisting of sheet metal pressed into form with the edges secured together and having open space between the sides thereof, said sections having a flange extending inwardly in the general plane of the frame, and slats extending across the frame and secured at their ends to said inwardly-extending portions, substantially as set forth.

9. A rectangular metallic frame made in two sections, the edges of one section being secured to those of the other section, and separators between said sections and abutting against the adjacent faces thereof, the material of each of said sections extending into said separators, substantially as set forth.

10. A rectangular metallic frame made in two sections, one of said sections having edge flanges coacting with the edges of the other section, and separators between said sections and abutting against the inner faces thereof, the material of said sections extending into said separators, substantially as set forth.

11. A rectangular metallic frame made in two sections, one of said sections having edge flanges coacting with the edges of the other section, overlaps formed in said sections, and separator-sleeves between said overlaps and abutting against the adjacent faces thereof, the material of said overlaps extending into said sleeves, substantially as set forth.

12. In a joint, the combination with two frame-sections each comprising two members, of a sleeve between said members, the ends of the members of one section overlapping those of the other, its ends abutting against the adjacent faces thereof, the material of said members being forced into said sleeve under pressure, substantially as set forth.

13. A rectangular metallic frame made in sections secured together, a series of coil-springs overlying and secured to said frame, and a series of metallic spring-plates overlying said coil-springs and arranged in parallel planes with the several members of said sectional frame, substantially as set forth.

14. A rectangular metallic frame formed of a plurality of frame-sections secured together at their ends and slats extending across said frame and secured at their ends thereto, an auxiliary metallic frame, coil-springs supporting the same upon the first-mentioned frame, a plurality of springs secured upon said slats and metallic flat springs overlying and supported on said springs, substantially as set forth.

15. A rectangular metallic frame formed of a plurality of frame-sections secured together at their end and slats extending across said frame and secured at their ends thereto, each of said sections consisting of sheet metal pressed into form with the edges secured together and having open space between the sides thereof, an auxiliary frame yieldingly supported on said frame, a plurality of springs secured upon said slats and metallic flat springs overlying and supported on said springs, substantially as set forth.

This specification signed and witnessed this 16th day of May, 1905.

EDWARD G. BUDD.

Witnesses:
R. M. FRIES,
S. D. GROOME.