

(No Model.)

2 Sheets—Sheet 1.

W. BRUCE.  
FOLDING CRATE.

No. 413,492.

Patented Oct. 22, 1889.

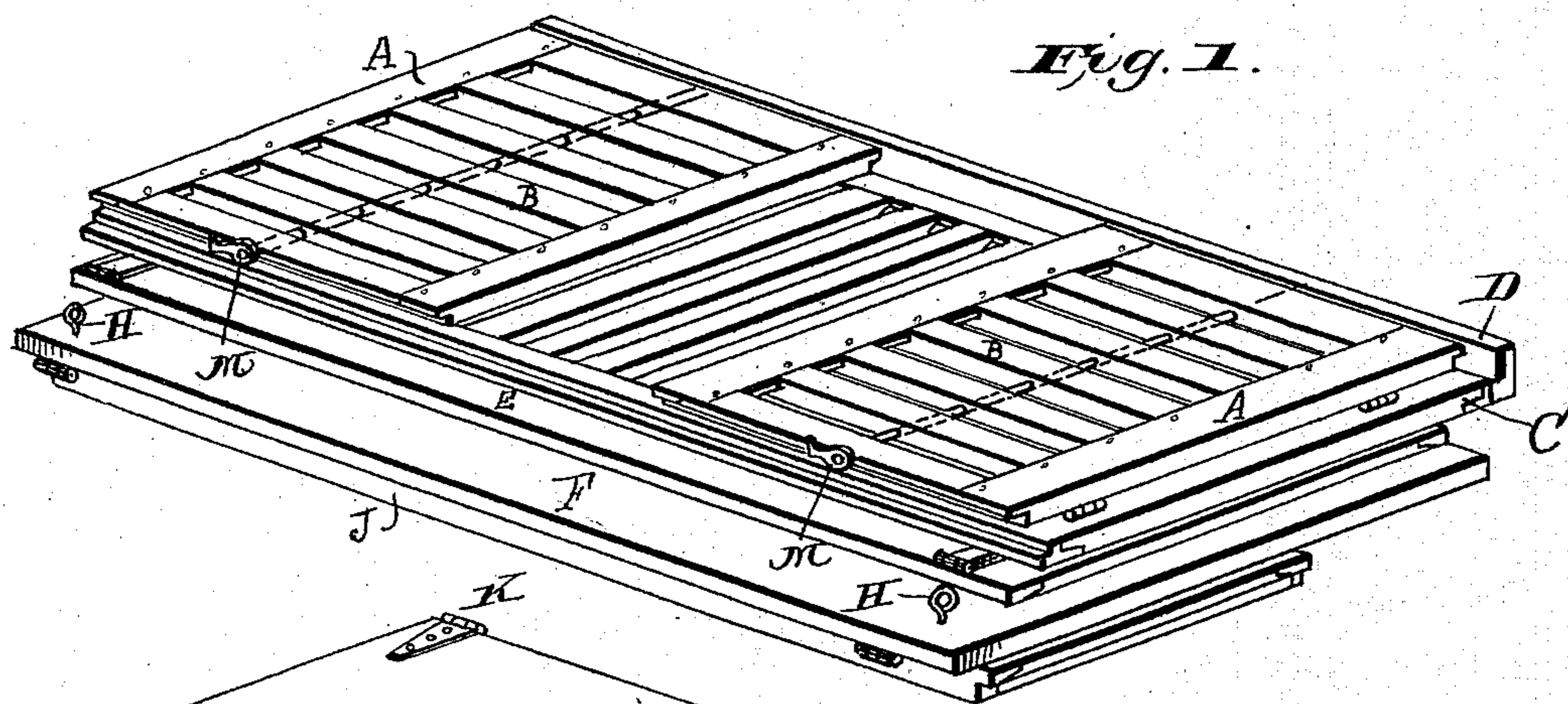


Fig. 1.

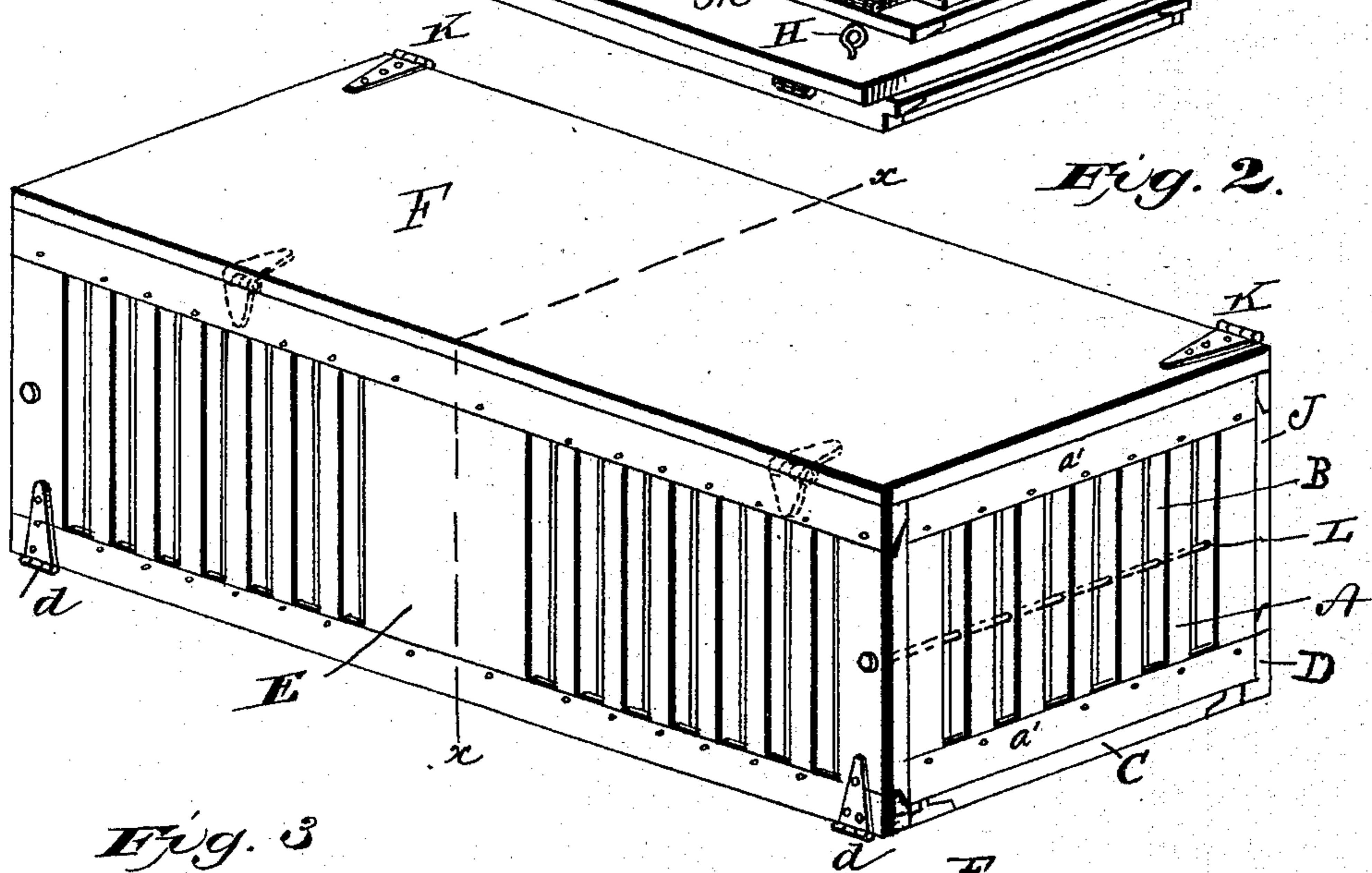
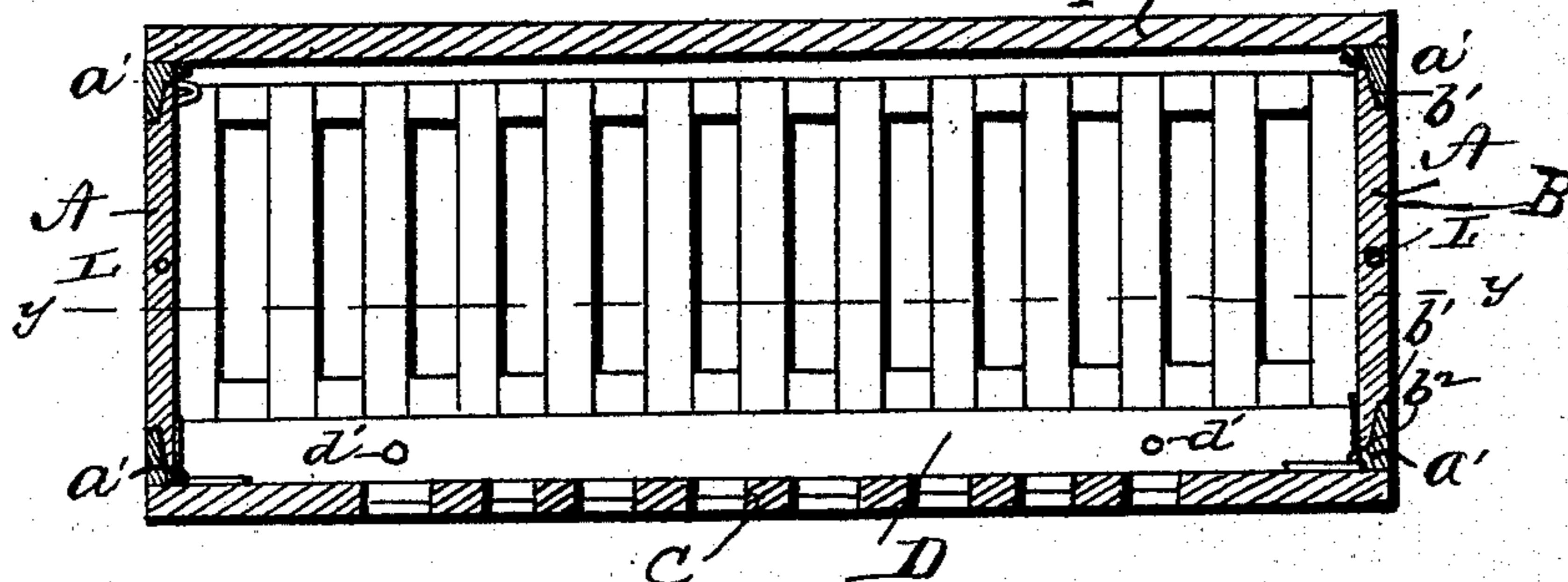


Fig. 2.

Fig. 3.



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INVENTOR:

William Bruce  
By James Dugger & Co.  
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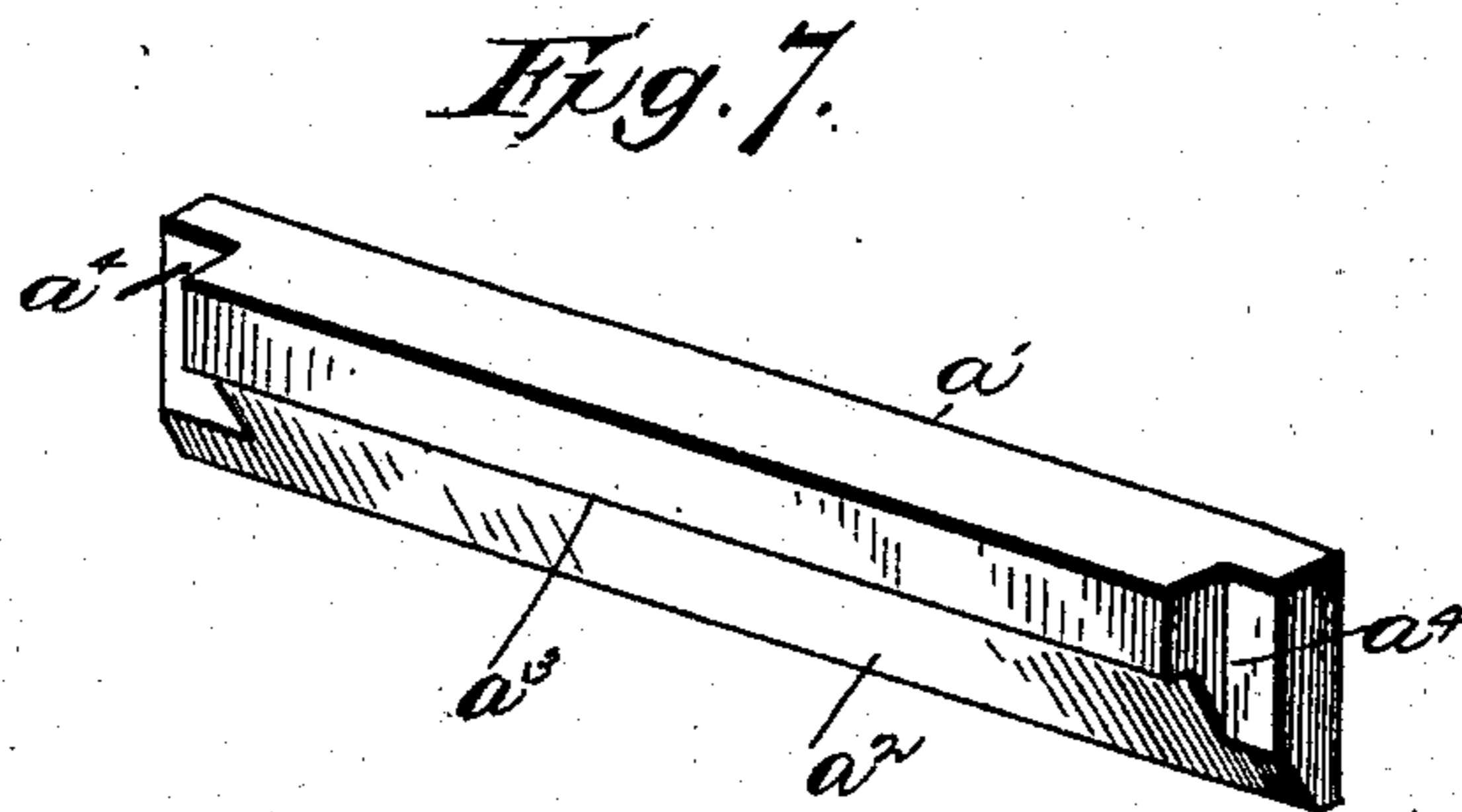
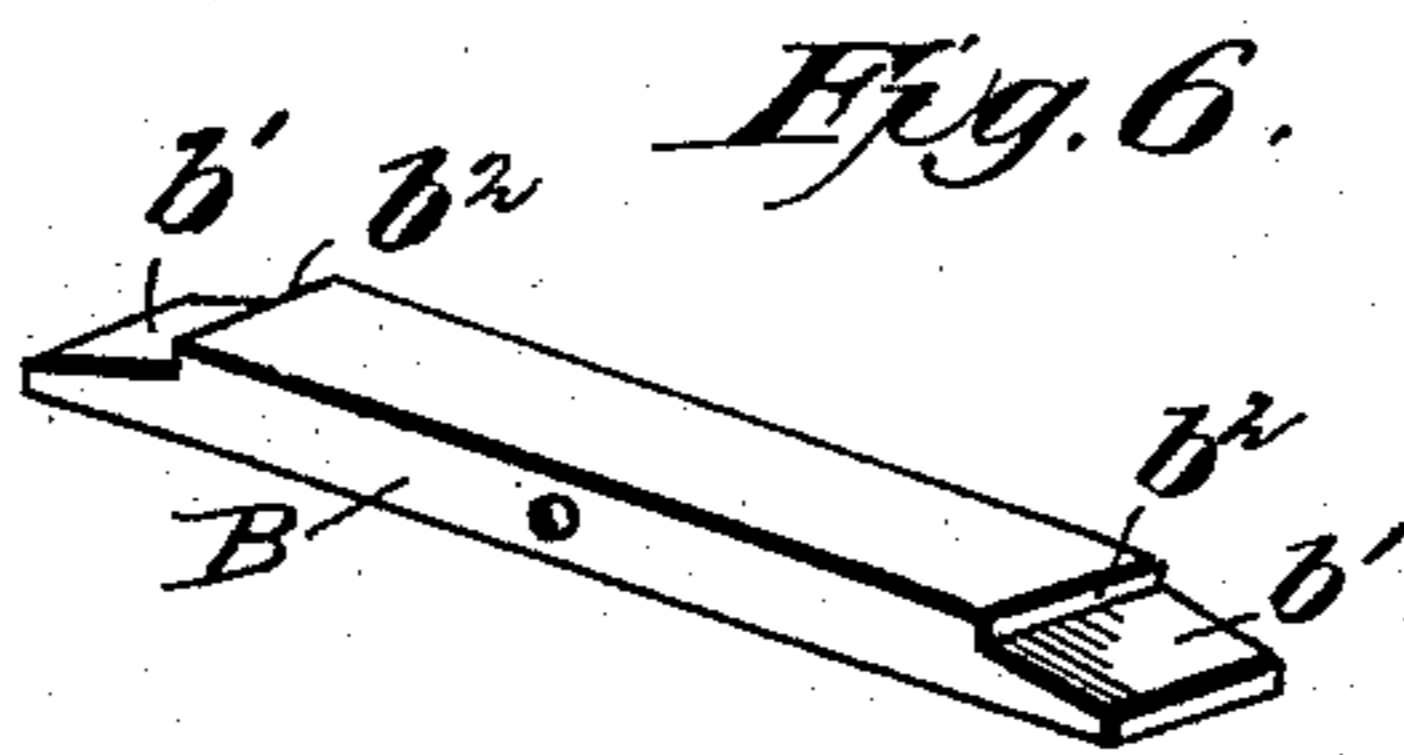
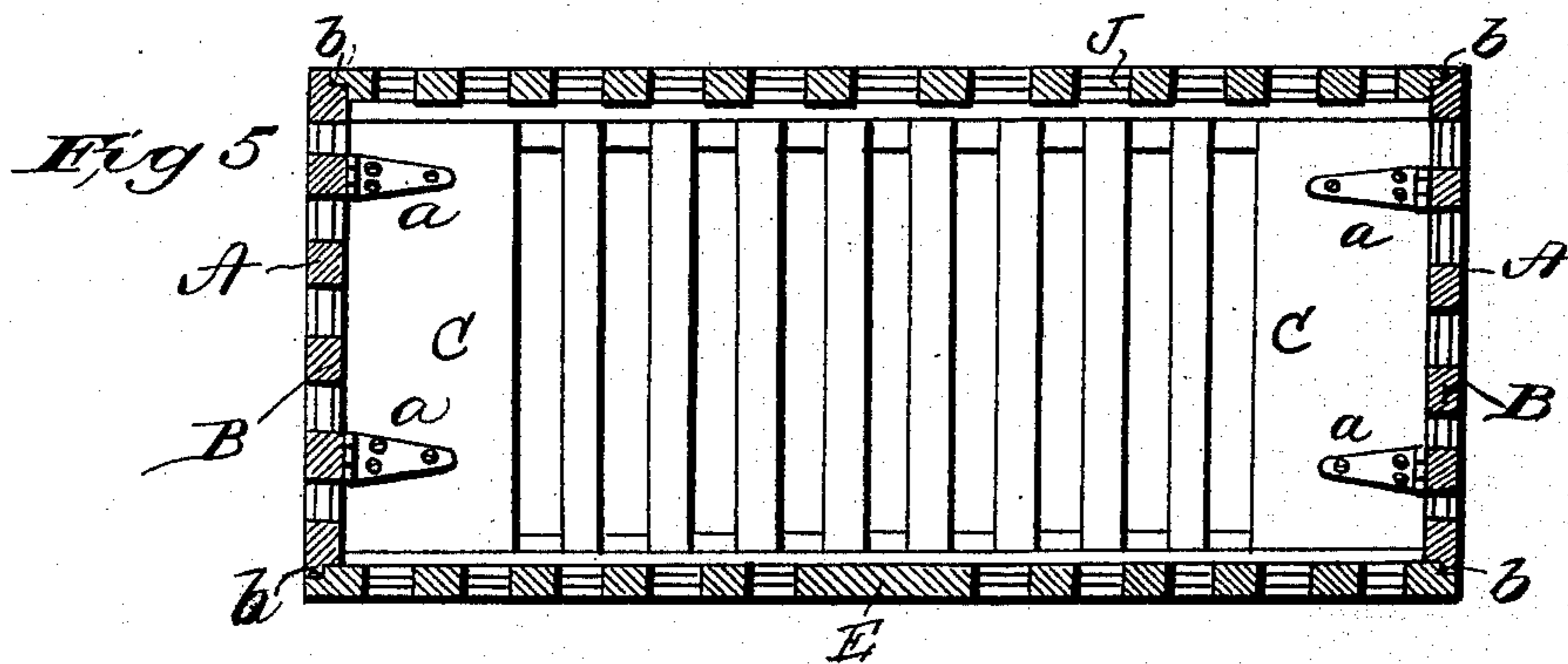
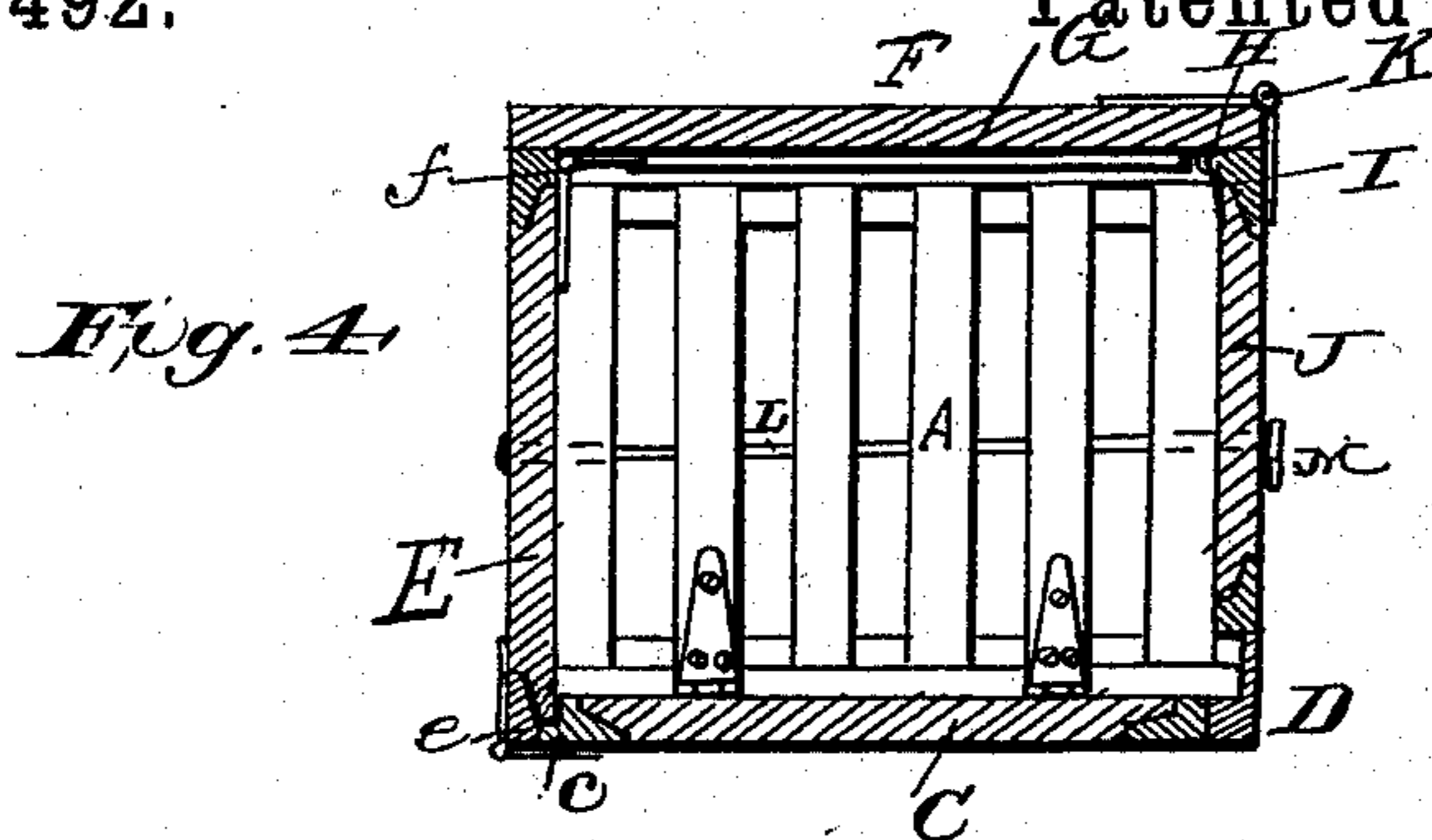
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2 Sheets—Sheet 2.

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WITNESSES:  
F. L. Curand  
A. L. Morsell.

INVENTOR:  
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# UNITED STATES PATENT OFFICE.

WILLIAM BRUCE, OF WELLSVILLE, NEW YORK.

## FOLDING CRATE.

SPECIFICATION forming part of Letters Patent No. 413,492, dated October 22, 1889.

Application filed July 17, 1889. Serial No. 317,757. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM BRUCE, a citizen of the United States, and a resident of Wellsville, in the county of Allegany and State of New York, have invented certain new and useful Improvements in Folding Crates; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a perspective view of my improved folding crate as the same appears when folded or collapsed. Fig. 2 is a similar view of the crate as it appears when put together or closed. Fig. 3 is a longitudinal vertical sectional view. Fig. 4 is a cross-section on the line  $x x$ , Fig. 2. Fig. 5 is a horizontal section on the line  $y y$ , Fig. 3; and Figs. 6 and 7 are detail views, respectively, of the slat and connecting horizontal piece.

Like letters of reference denote like parts throughout the several views.

This invention has relation to collapsible boxes, crates, or coops for shipping fruits and vegetables, eggs, live fowls, and merchandise generally, of that class in which the several parts are hinged to one another, so as to permit of their being folded together in a compact form, and thereby occupying a minimum of space when the box is not in use; and my improvement relates more particularly to the peculiar construction of the box, whereby great rigidity and strength are attained to the several parts constituting the same, consisting of the detailed construction and combination of parts, as hereinafter described and claimed.

In the accompanying two sheets of drawings, the letters A A denote the two end pieces, which are hinged at  $a a$  by inwardly-opening hinges at opposite ends of the bottom piece. The top and bottom strips  $a' a'$  of these end pieces are provided with inner beveled faces  $a^2 a^2$ , terminating in shoulders  $a^3 a^3$ , while their opposite ends are cut away upon their inner sides to form right-angular notches  $a^4 a^4$ .

The letters B B represent slats or strips or a

solid panel secured between the top and bottom strips, the end slats or solid panel being cut away or notched longitudinally, as at  $b$ , said notches registering with the notches of the ends of the front and back pieces. These vertical slats or strips or solid panel B are also provided on opposite ends with inclined outer faces  $b' b'$ , said inclines terminating in shoulders  $b^2 b^2$ . It will be seen from the drawings that the shoulders upon the lower ends of the strips or slats or solid panel will rest upon the upper horizontal portion of the bottom connecting-strip, while the extreme lower end will rest upon the shoulder  $a^3$ . The inclines upon the upper ends of the slats or solid panel will in like manner register with the inclines upon the upper connecting-strip, while the shoulder  $b^2$  upon the upper end of the vertical strips or solid panel will bear against the lower edge of said connecting-strip, and the upper extreme end will be seated in the shoulder  $a^3$  of the connecting-strip. In this manner a most secure and rigid connecting of the parts together is effected, the registering bevels, furthermore, affording convenient surfaces for the driving of nails, rivets, or similar devices.

The bottom piece (represented by the letter C) is provided in front with an upwardly-projecting cleat or guard D, and is hinged on its opposite or rear side by outwardly-opening hinges  $d d$  to the lower edge of the back piece E. The arrangement of the slats or solid panel and connecting-pieces is similar in all respects to that of the end pieces, with the exception that the upper face of the rear connecting-piece is cut away at  $c$  or extended from the shouldered portion to receive the lower end of the back piece E. The latter also is formed with a series of slats or solid panel having inclined tenoned ends, the inclines registering with corresponding inclines upon the horizontal connecting-pieces. The inner face of the lower connecting-piece, however, is cut away, as shown at  $e$ , thereby permitting the ends of the vertical slats or solid panel of this part of the crate to rest or be supported by the rear extended portion of the bottom piece, while the extreme lower end of the back piece will be flush with the under side of the bottom. This back piece is

hinged to the top piece F of the crate by inwardly-opening hinges *ff*, said top piece being preferably constructed solid in the case of slotted crates and provided upon its under side, near opposite ends thereof, with guide-strips G G, and also near the front end with screw-eyes H H, adapted to receive hooks I I, secured in the longitudinal notches in the front vertical strips or solid panel of the end pieces. The edges of this top piece are not beveled and shouldered, as is the case with the other portions of the crate, but simply rest upon the top edges of said portions, and is connected to the front piece J by means of outwardly-opening hinges K K, whereby said front piece may be folded back upon the top or cover when the crate is opened. The horizontal connecting-strips and the vertical slats or solid panel forming this front piece are constructed exactly in accordance with the construction ascribed to the end pieces, and the lower end of this front piece, when the box is folded, will rest upon and be supported by the cleat or guard D, as clearly shown in Fig. 2 of the drawings. When in this closed or built-up position, ready for use, the end pieces are held in place by the guide-strips G G upon the under side of the top piece, and also by the hooks and engaging-eyes.

After the box or crate has been filled with the articles which it is to contain it is closed by folding the front side down into its vertical or upright position, after which all the parts are firmly locked or bound together by bolts L—one on each side—which pass through the back piece, end pieces, and front piece, so as to draw and firmly bind these several parts together by means of nuts M. The front cleat or guard is also provided with end perforations *d' d'*, so that when the box is folded these bolts may also be utilized, as shown in Fig. 1 of the drawings—that is, may be inserted through the end pieces and through the perforations in the cleat or guard. This provides for the safe keeping of the bolts and nuts, besides keeping the ends from flapping when the crate, collapsed, is bound by a cord for reshipping or stowing away.

One great advantage possessed by my crate is its great rigidity and stiffness, this being attained by constructing the ends of the end pieces, back piece, and front piece with registering notches, whereby a close and compact fit of the several portions of the crate is attained. The particular advantage, however, claimed by me is the construction of the slats or solid panel and connecting-pieces of the crate, the ends of the slats or top and bottom of solid panel of the end pieces, front piece, and bottom piece being supported by the shouldered and inclined surfaces of the connecting horizontal pieces, while the upper ends of the slats or solid panel of the back piece are similarly supported and wedged, the lower ends, however, when the box is closed, resting upon the extended piece of the bottom. It is obvious that by this construction a most com-

pact, strong, and durable arrangement results, capable of withstanding the most severe strain, and by which, also, means are afforded for more conveniently and securely connecting the several parts together. Besides the function named for the cleat D—viz., that of supporting the lower end of the front piece when the box is put together and securing the ends of the crate when collapsed by means of the bolts and nuts—it also has the additional function of acting as a guard or protector when the box is collapsed. When in this latter position, the ends are folded down upon the bottom, the bottom and end pieces therefore occupying the uppermost position, and thus more readily damaged. The guard or cleat, however, extending upward, will prevent to a great extent any damage which may result from a side blow or any lateral force or pressure.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. As an improved article of manufacture, the herein-described folding shipping box or crate, consisting of the bottom piece, the cleat or guard secured thereto, forming an abutment for the lower edge of the front piece and a guard for the end pieces when the box is collapsed, the end pieces hinged to said bottom piece by inwardly-opening hinges, the back piece connected to said bottom by outwardly-opening hinges, the top piece connected to said back piece by inwardly-opening hinges, the front piece connected to said top piece by outwardly-opening hinges, the hooks secured to the end pieces and engaging screw-eyes in the top piece, and the side bolts for locking the front, back, and end parts together when the box is put together or closed, substantially as set forth.

2. As an improved article of manufacture, the herein-described folding shipping box or crate, consisting of the bottom piece, the cleat or guard secured thereto and provided near opposite ends with bolt-holes, the end pieces hinged to said bottom piece by inwardly-opening hinges, and the slats or solid panel thereof being provided with bolt-holes or recesses, the back piece connected to said bottom by outwardly-opening hinges and having the end slats or opposite ends of the panel thereof provided with bolt-holes, the top piece connected to said back piece by inwardly-opening hinges, the front piece connected to said top piece by outwardly-opening hinges and having the end slats or opposite ends of the panel thereof provided with bolt-holes, the hooks secured to the end pieces and engaging screw-eyes in the top piece, and the nutted side bolts, substantially as set forth.

3. As an improved article of manufacture, the herein-described folding shipping box or crate, having its sides formed of vertical slats or solid panels and horizontal connecting-pieces, said vertical slats having beveled

ends terminating in shoulders, and the horizontal connecting-pieces having registering inclines and shoulders, substantially as set forth.

5 4. In a folding shipping box or crate, the combination of the end pieces having angular notches upon their inner corners, said end pieces consisting of vertical slats or solid panels having opposite beveled ends termi-  
10 nating in shoulders and horizontal connecting-pieces having registering inclines and shoulders, the bottom piece having its slats or solid panel and connecting-pieces constructed similarly to the end pieces, the rear  
15 connecting-piece thereof, however, being further provided with a lateral extension, the back piece having angular notches upon its corners and consisting of the upper connecting-piece provided with beveled and shoul-

dered inner face, slats or solid panel having 20 opposite beveled ends terminating in shoulders, and lower connecting-piece having beveled inner face terminating in a reduced extended portion, the lower ends of the vertical slats or solid panel of said back piece adapted 25 to rest upon the rearward extension of the bottom piece, the top piece, and the front piece having angular notches upon its inner corners, the slats or solid panel and connecting-pieces thereof constructed similarly to 30 the end pieces, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

WILLIAM BRUCE.

Witnesses:

WILLIAM EDWARD SACKETT,  
JOHN B. JONES.