

H. S. HOPKINS.
TRUSS BRIDGE CONNECTION.

No. 393,433.

Patented Nov. 27, 1888.

Fig. 1.

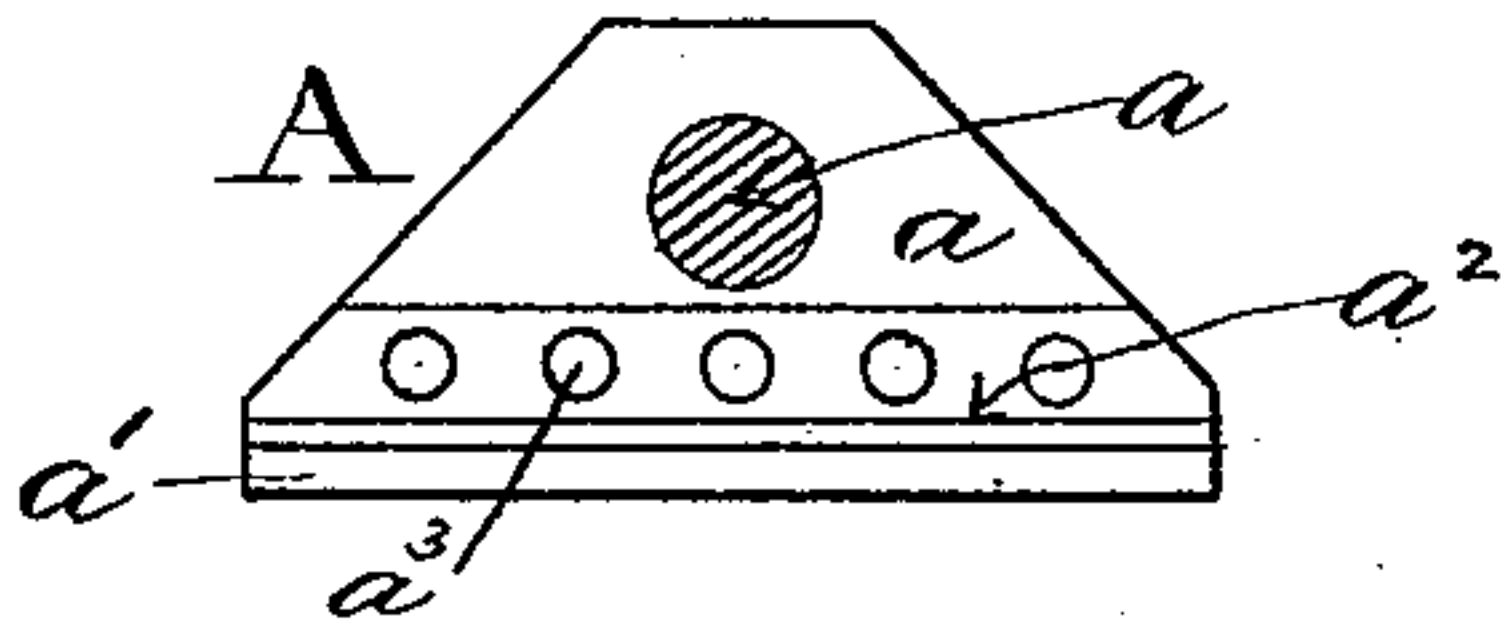


Fig. 2.

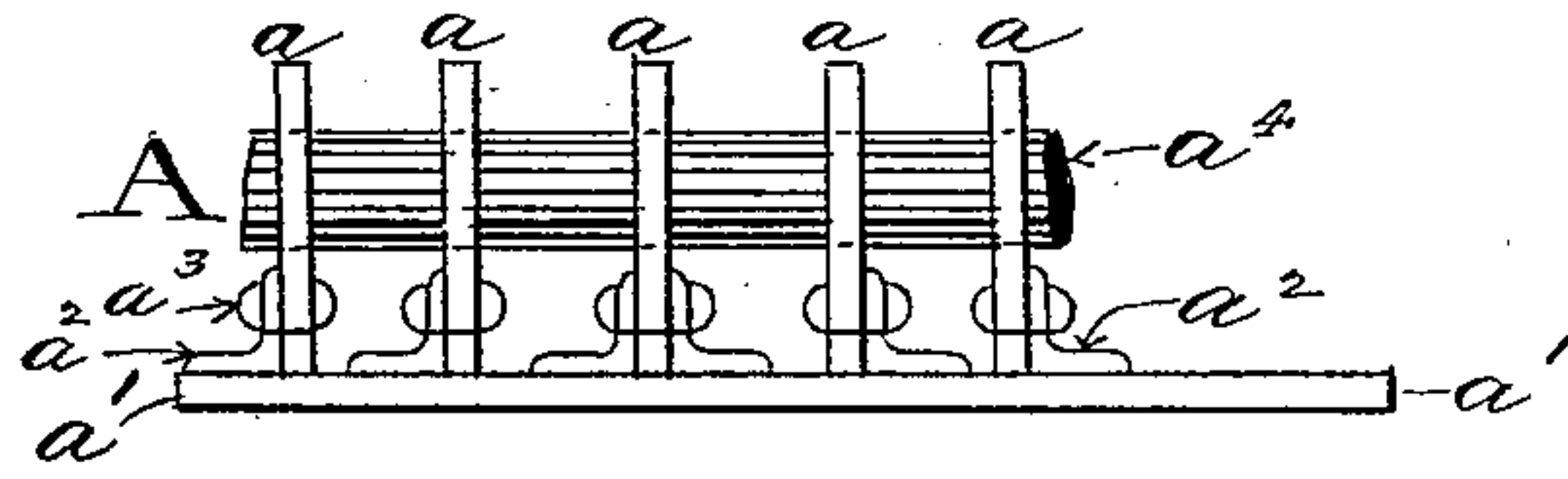


Fig. 3.

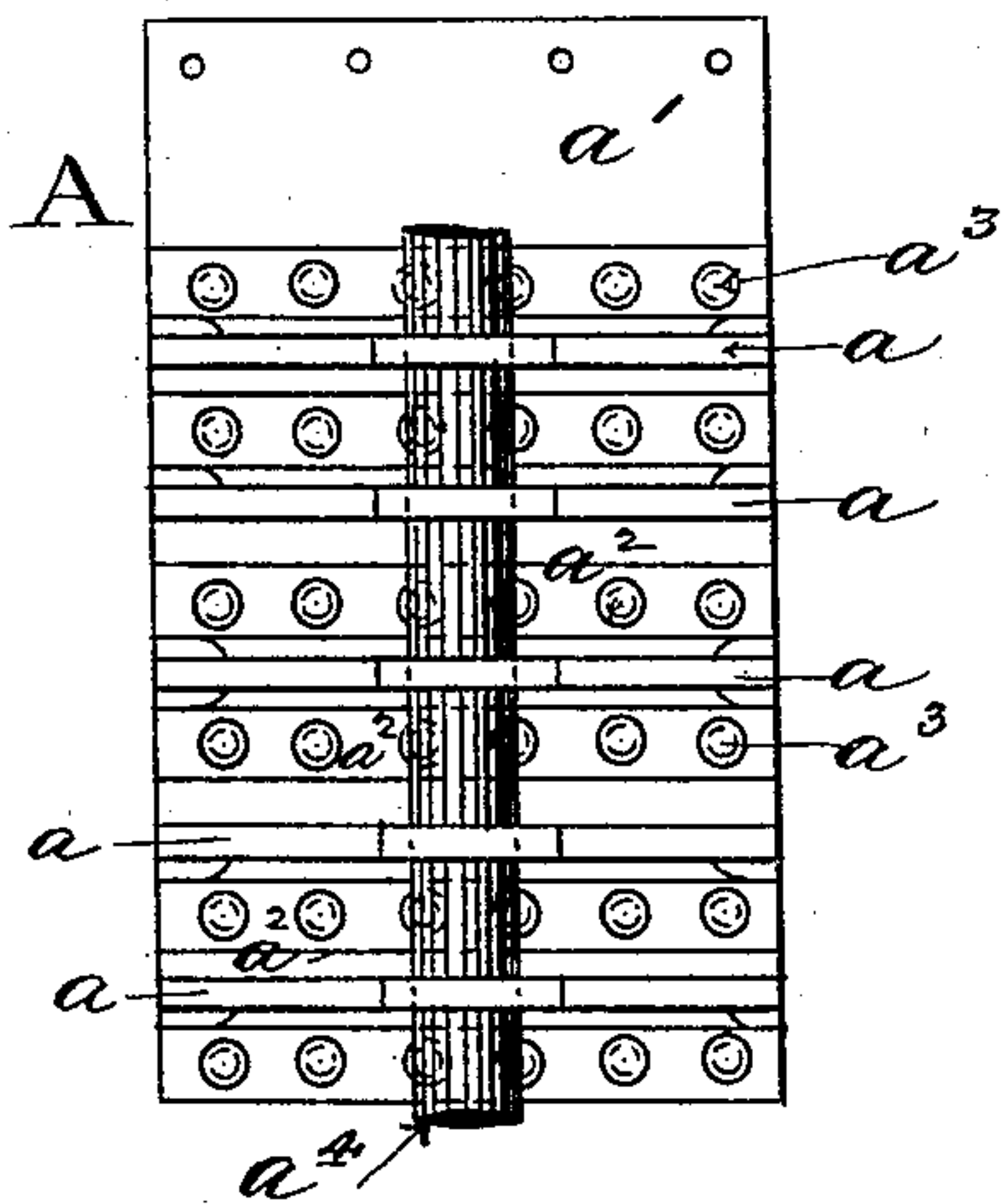


Fig. 4.

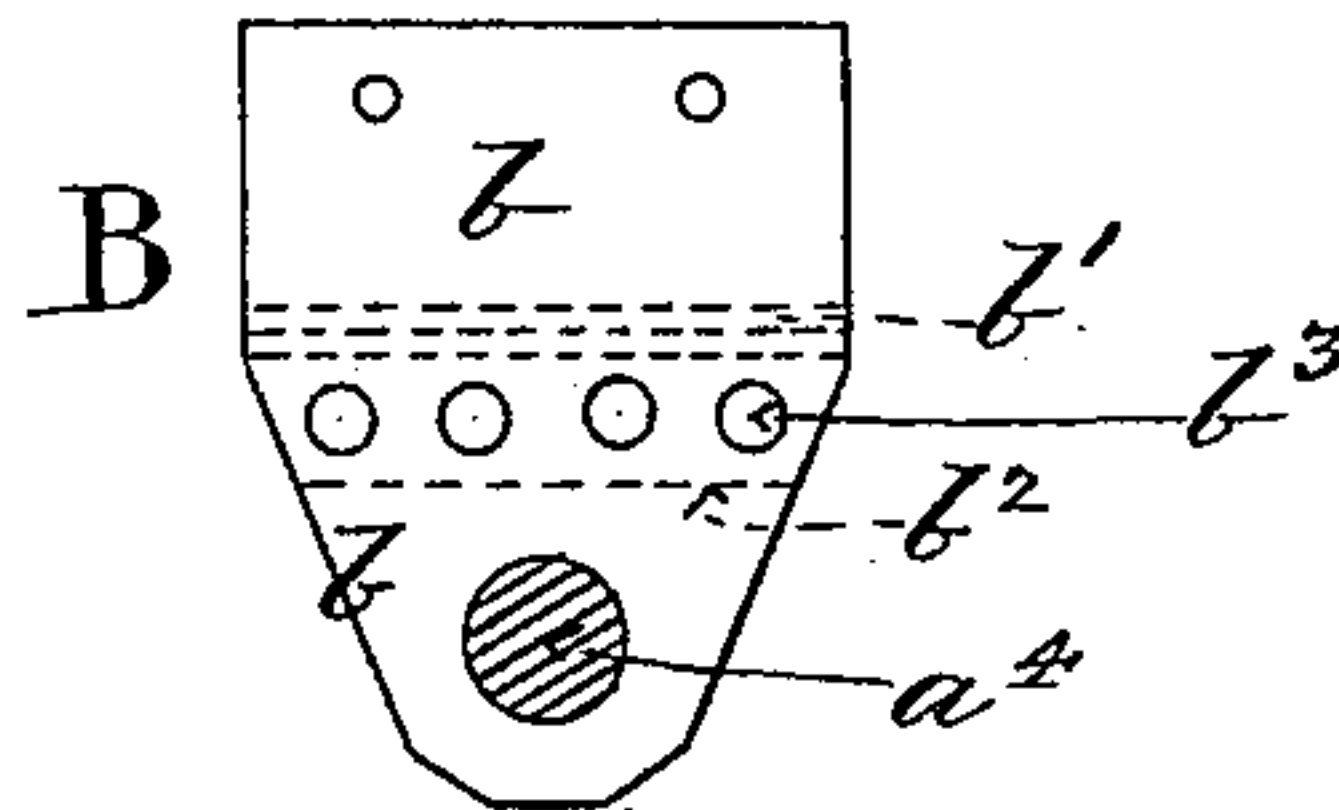


Fig. 5.

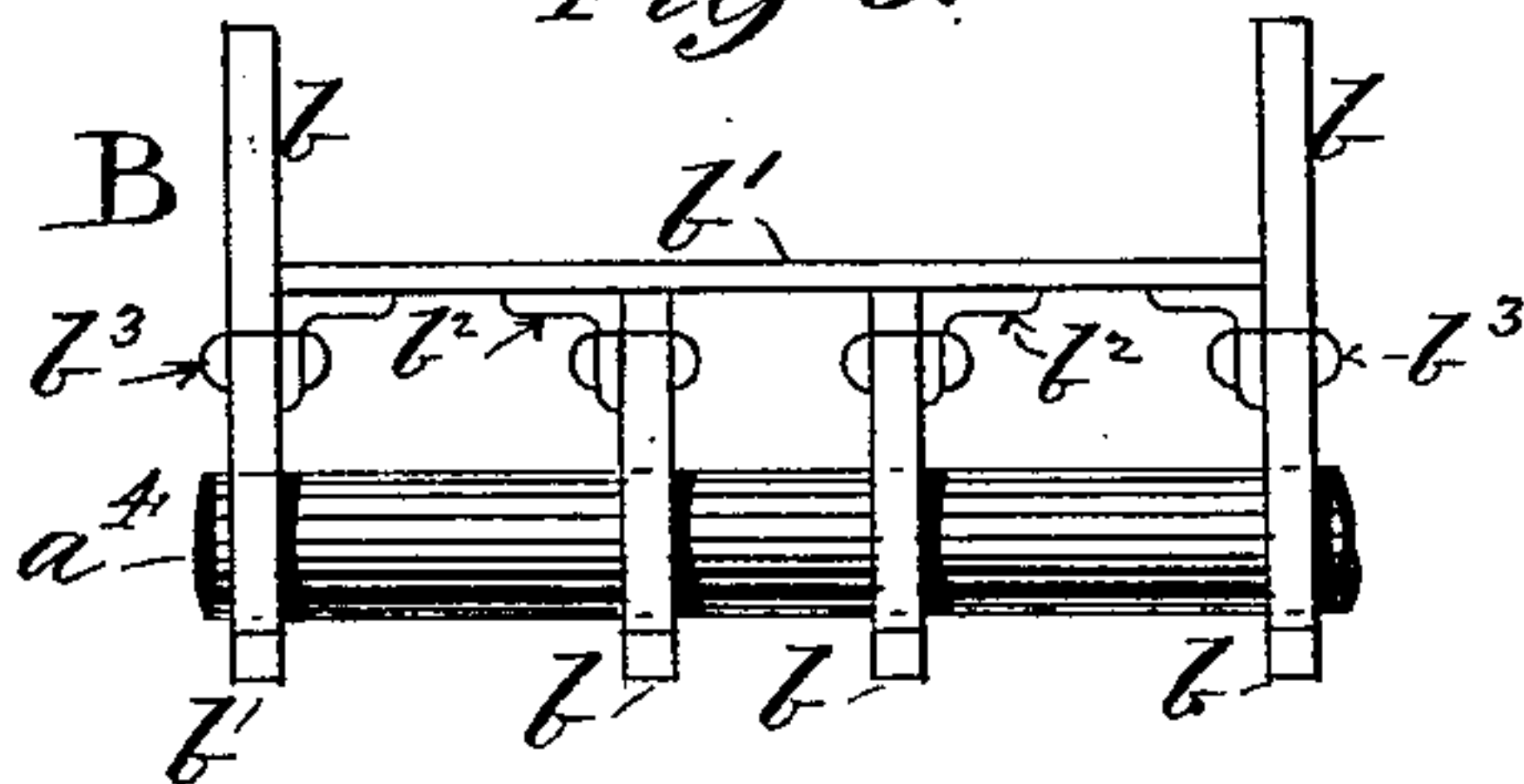
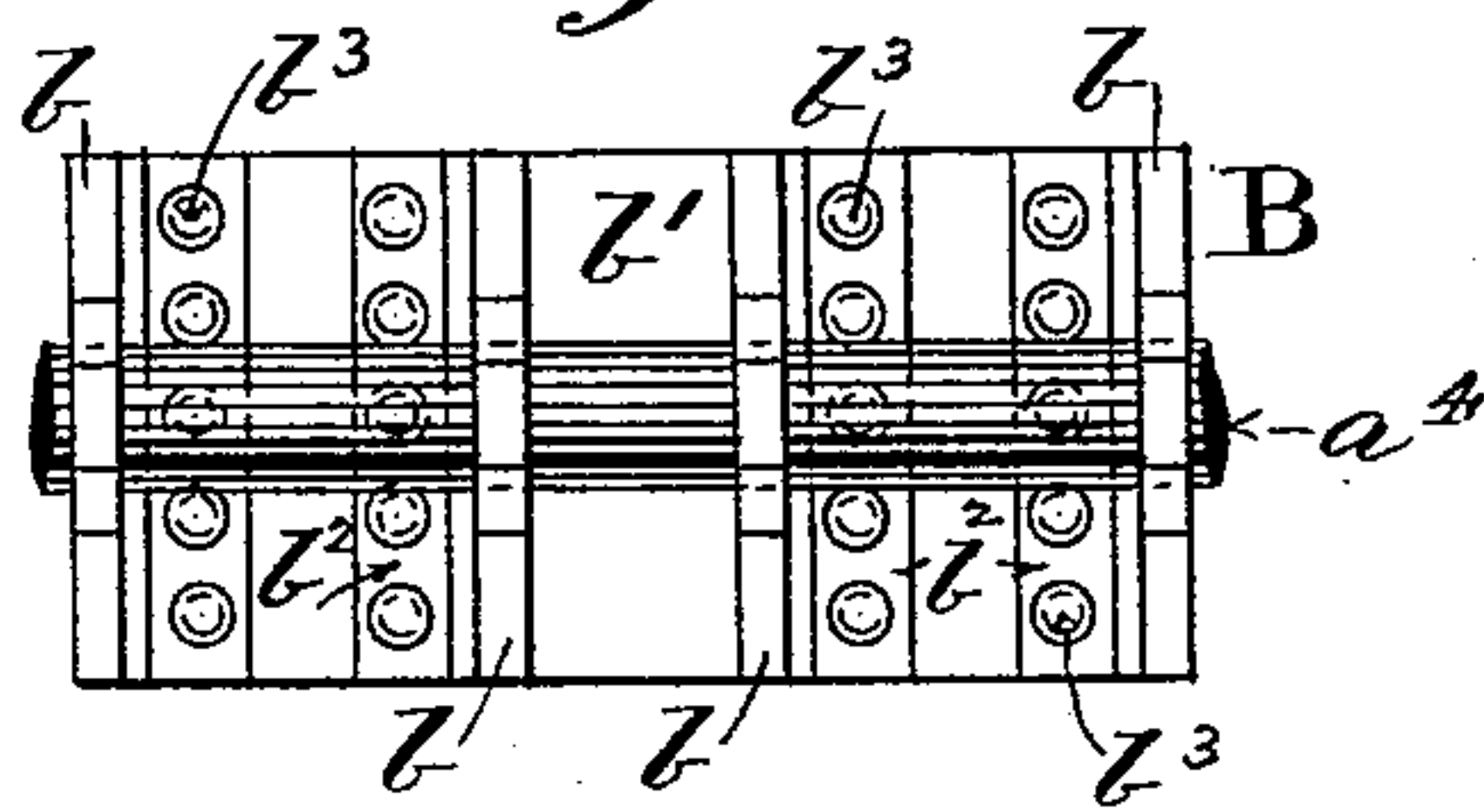


Fig. 6.



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Paul Bakerell,
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Fig. 7.

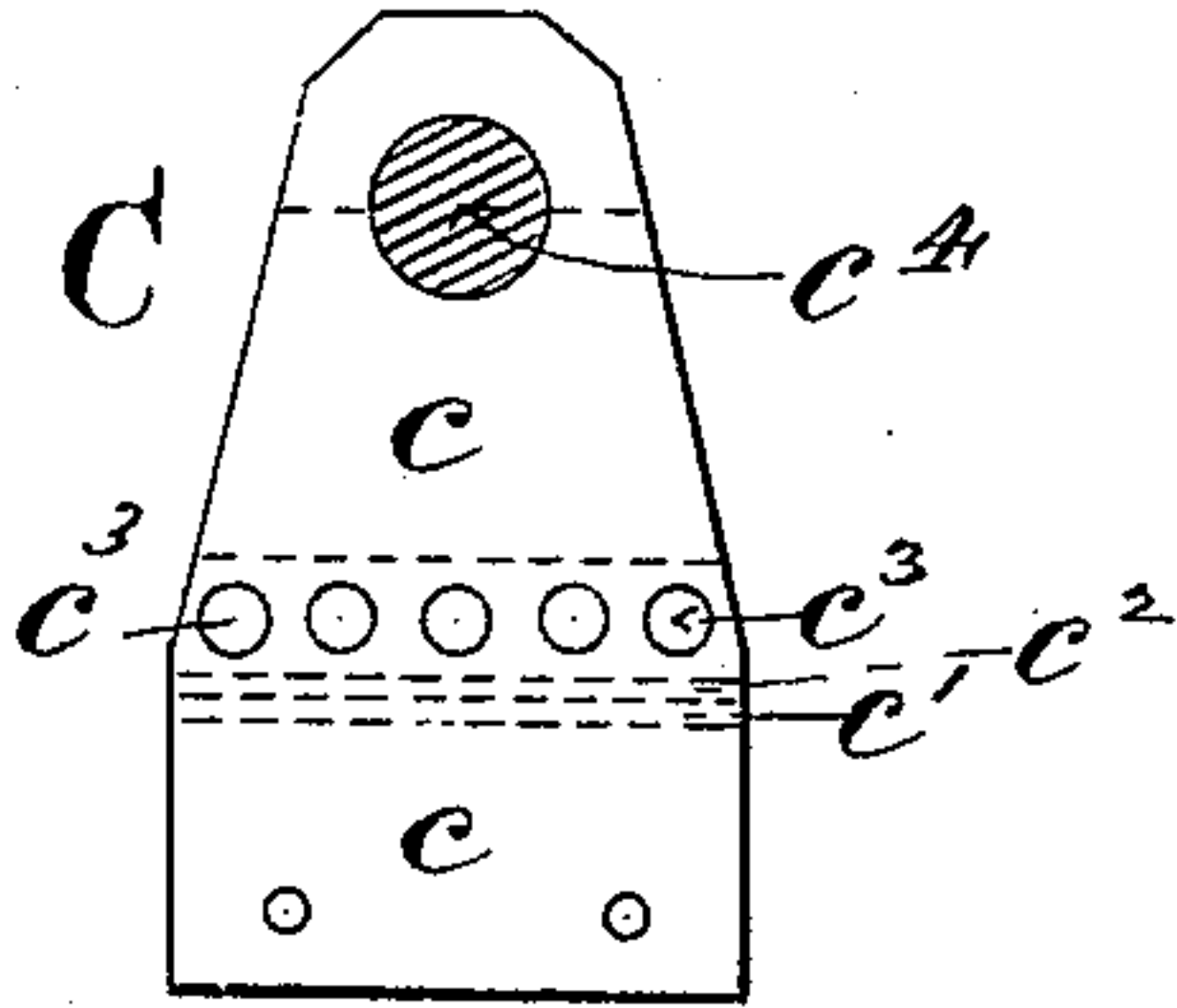


Fig. 8.

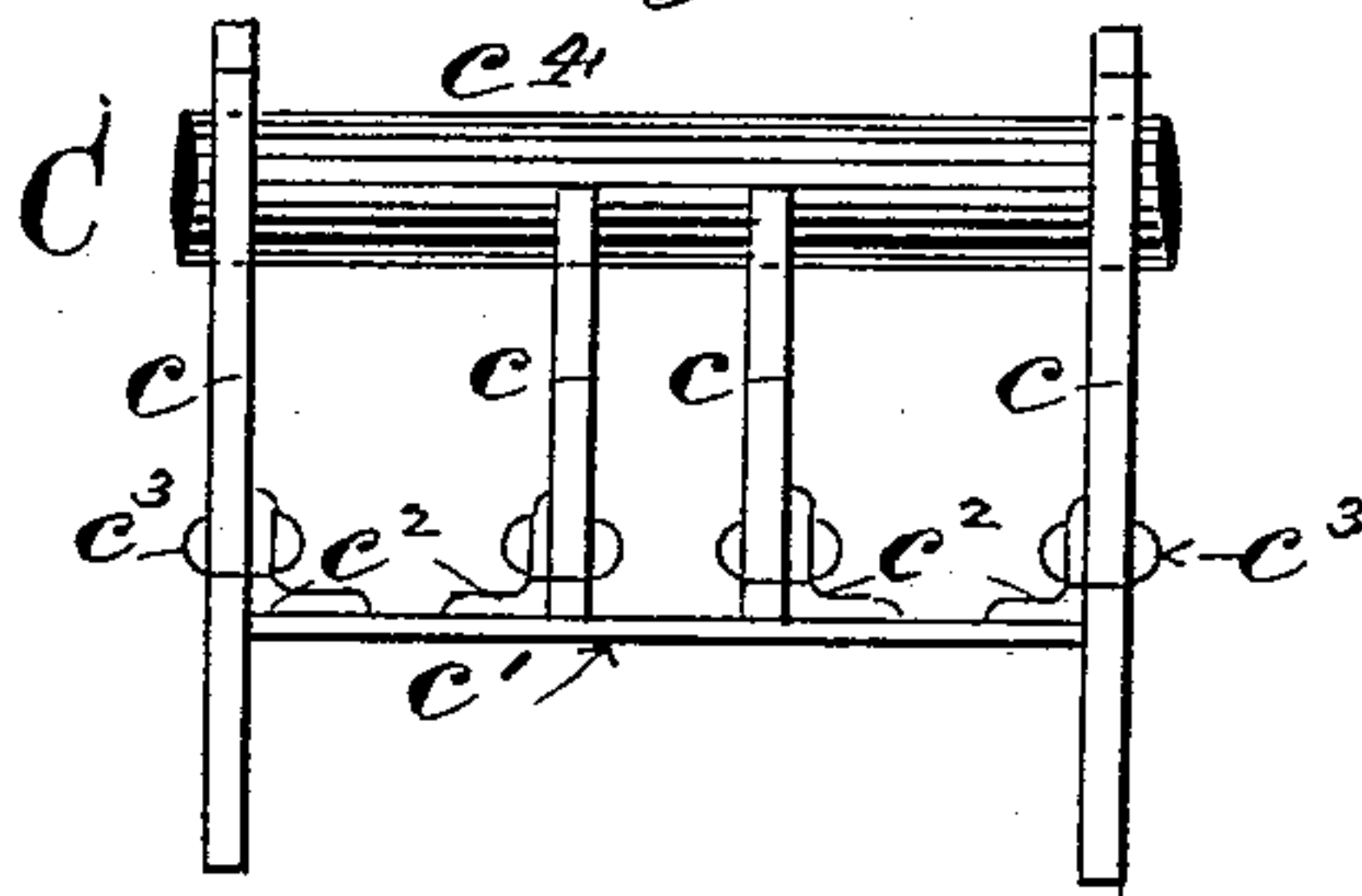


Fig. 10.

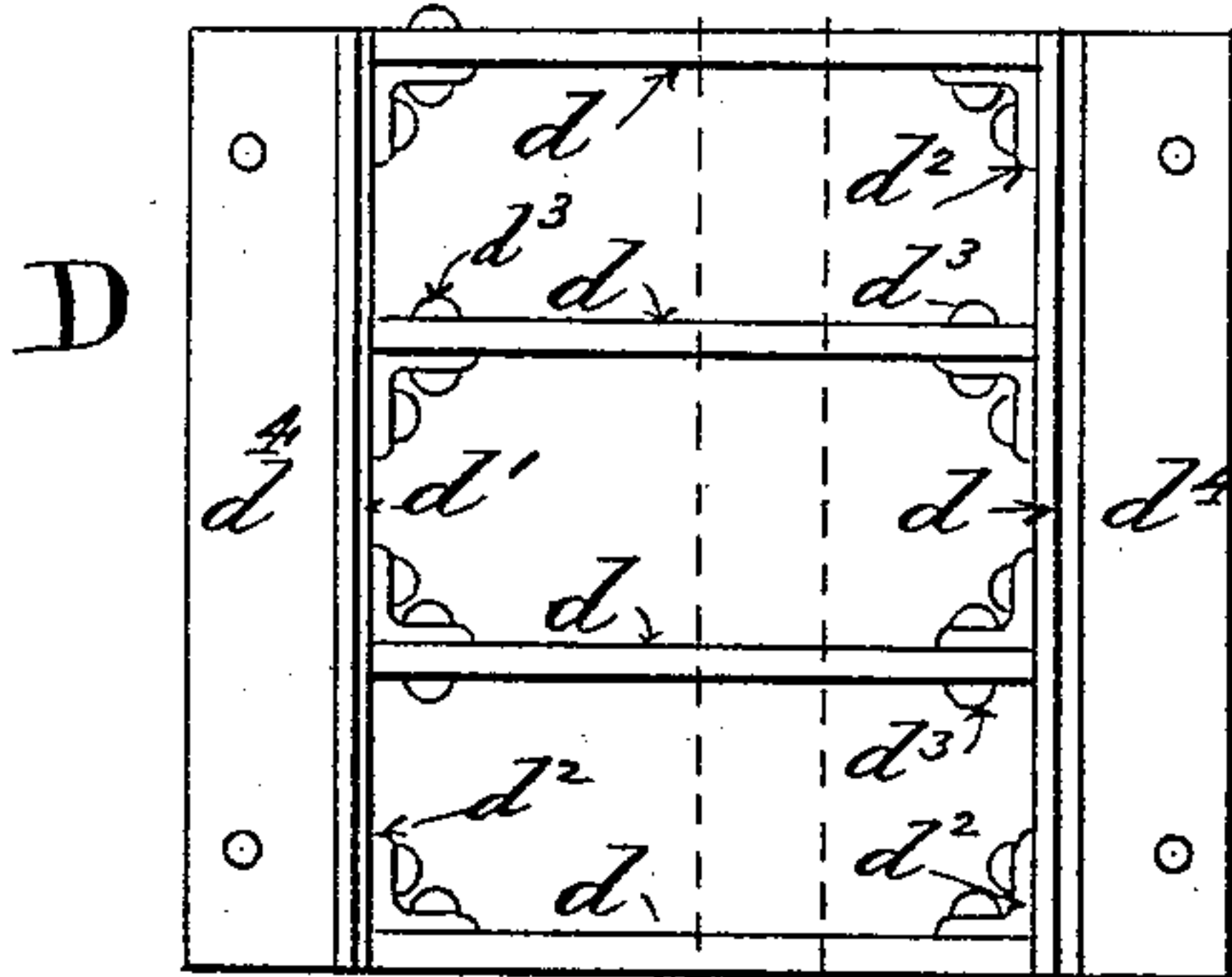


Fig. 9.

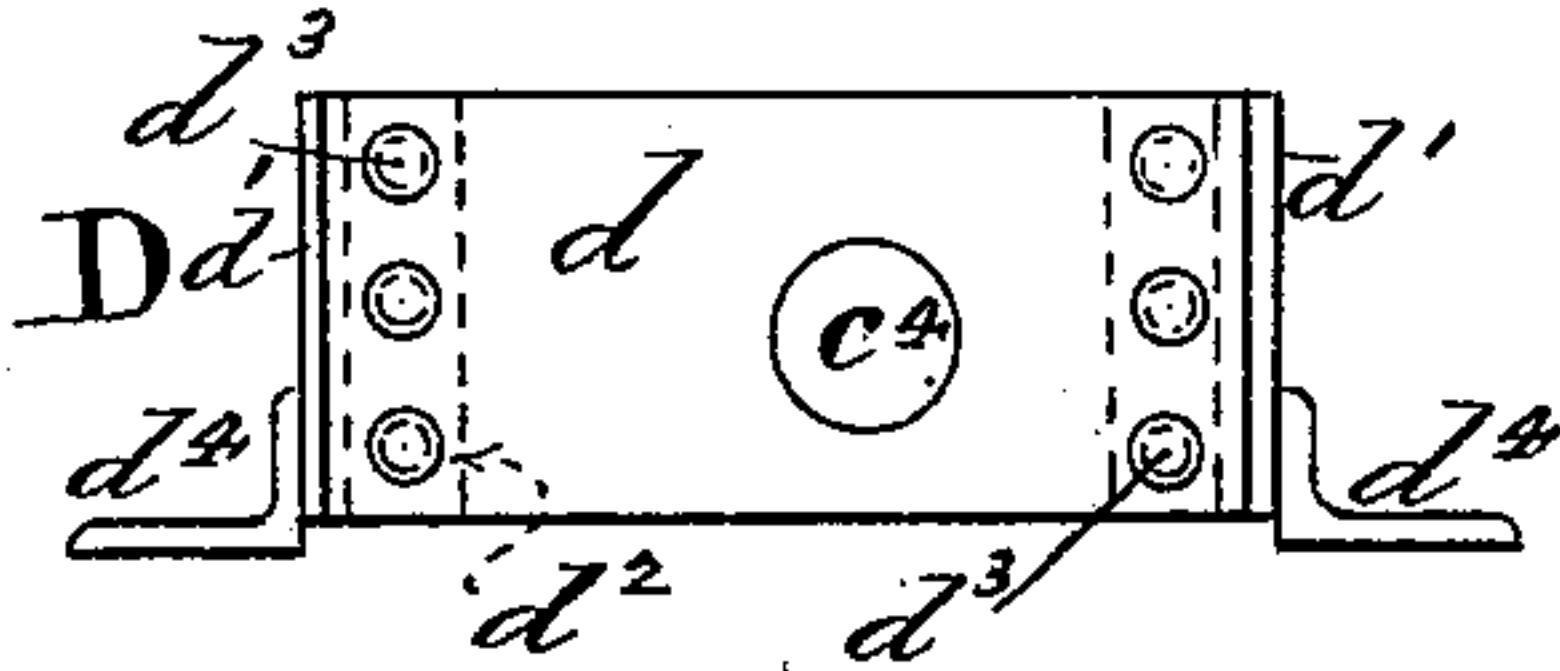


Fig. 13.

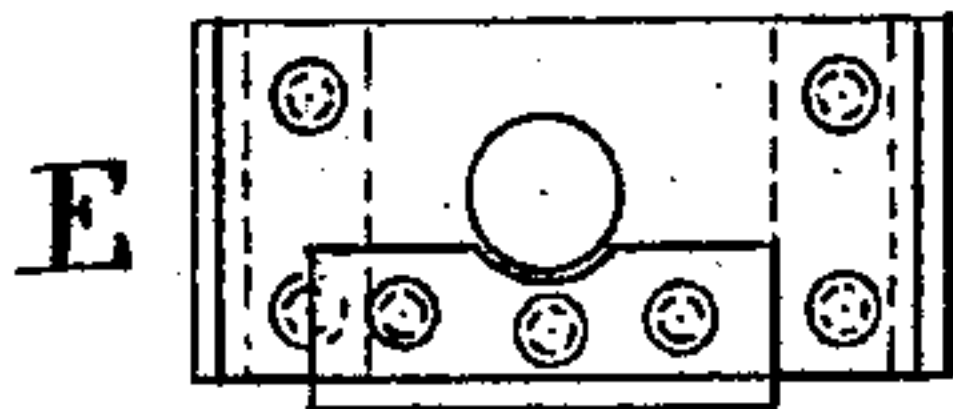


Fig. 14.

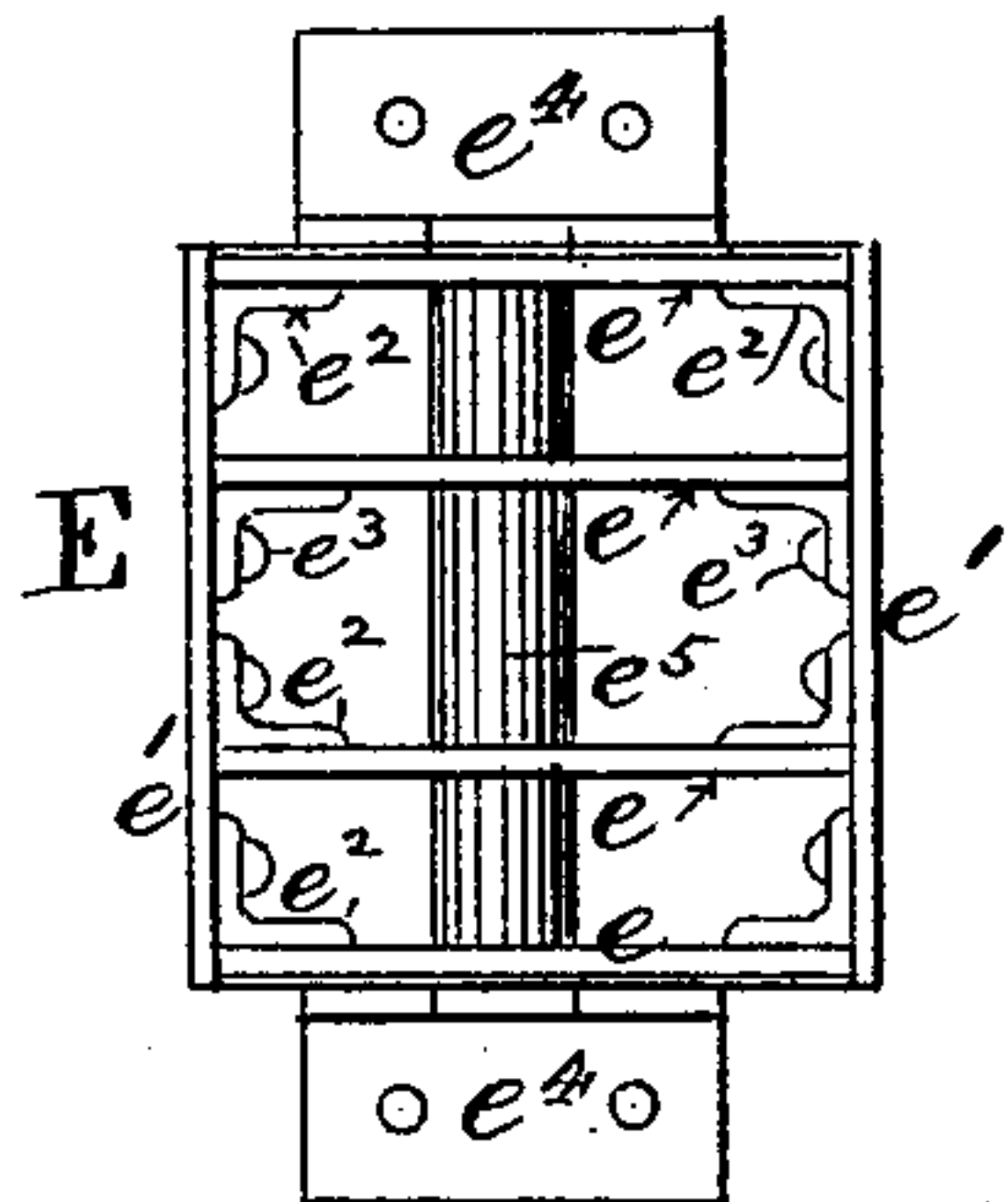


Fig. 11.

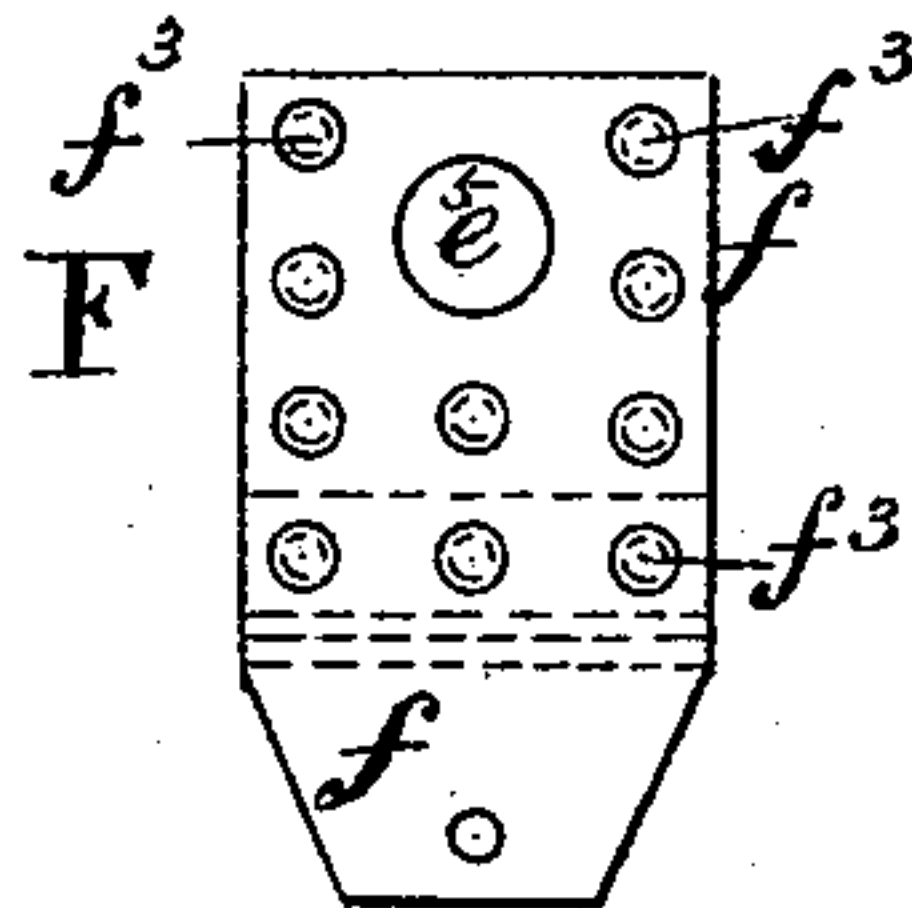
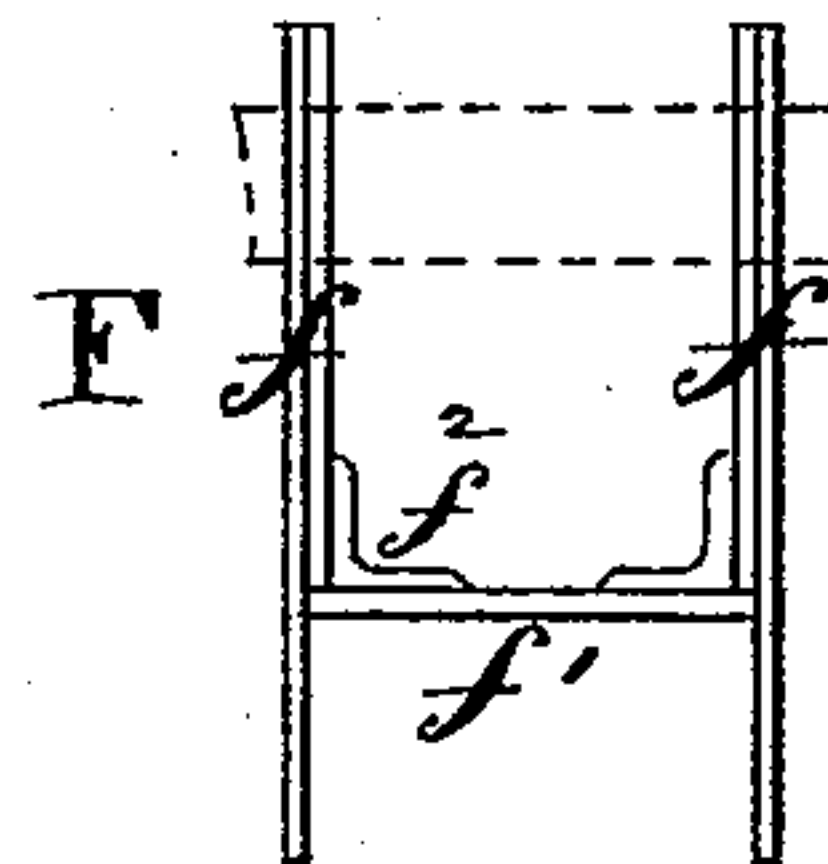


Fig. 12.



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(No Model.)

3 Sheets—Sheet 3.

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Fig. 15.

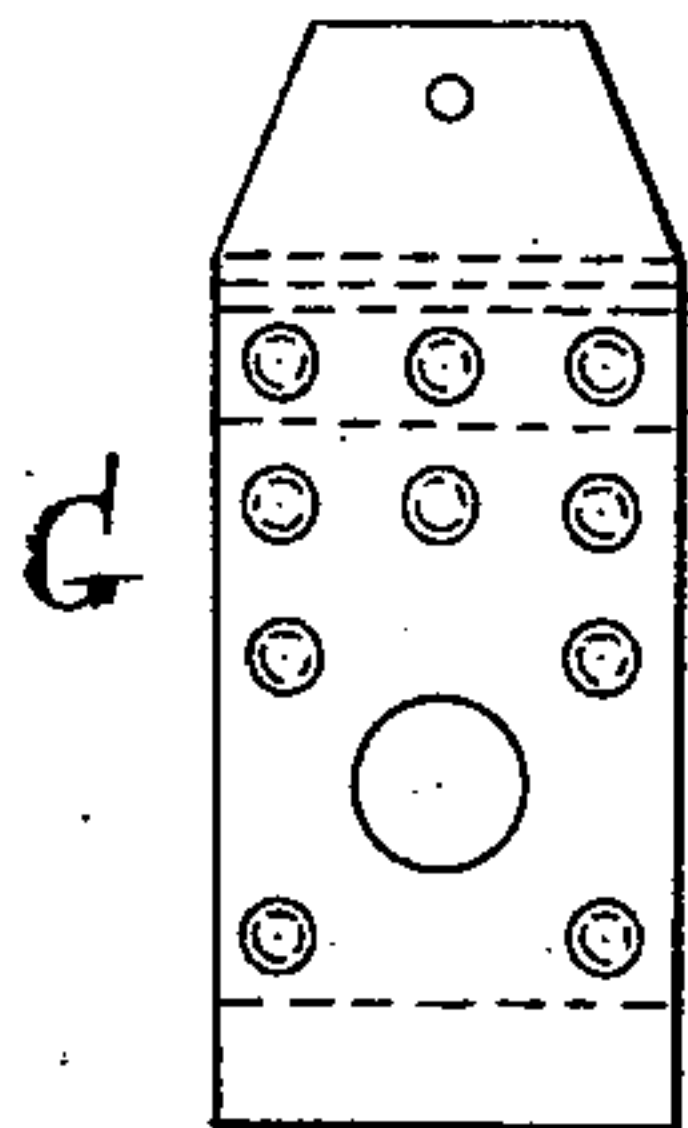


Fig. 16.

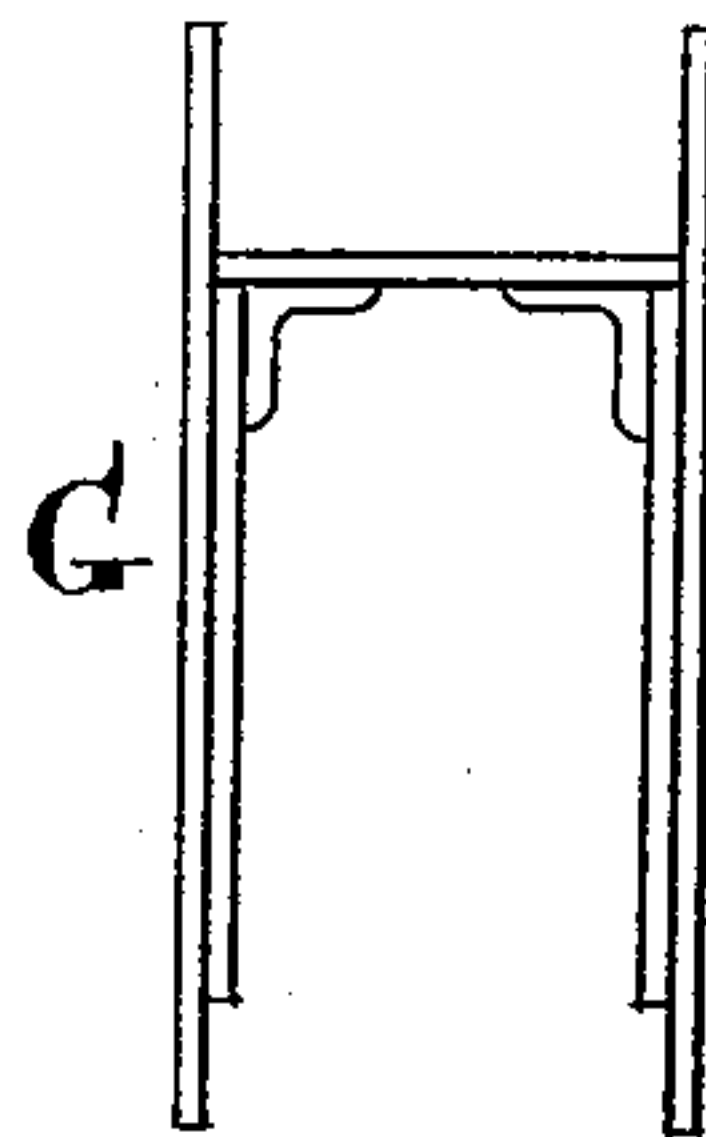
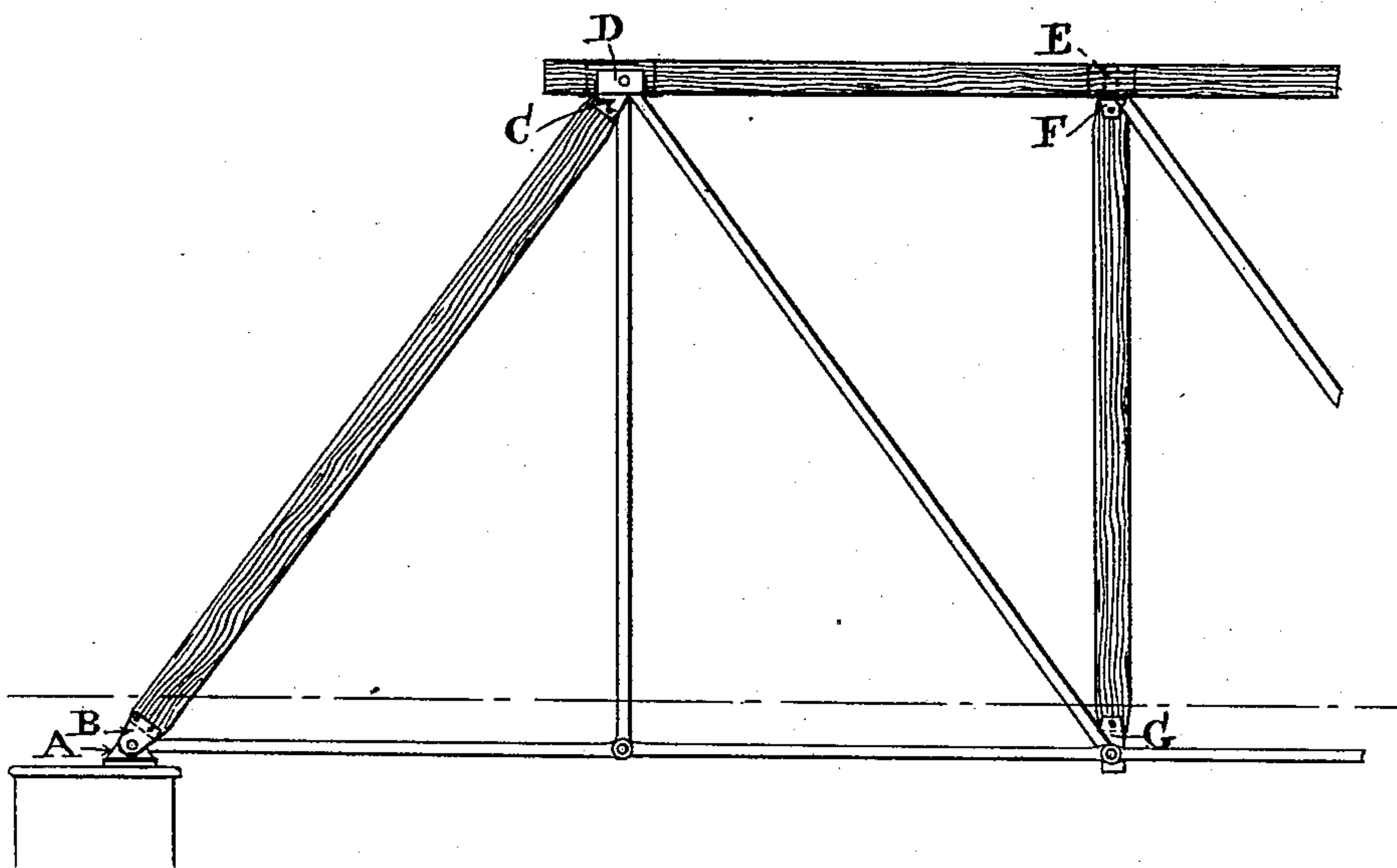


Fig. 17.



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UNITED STATES PATENT OFFICE.

HENRY S. HOPKINS, OF ST. LOUIS, MISSOURI.

TRUSS-BRIDGE CONNECTION.

SPECIFICATION forming part of Letters Patent No. 393,433, dated November 27, 1888.

Application filed July 28, 1888. Serial No. 281,289. (No model.)

To all whom it may concern:

Be it known that I, HENRY S. HOPKINS, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Bridges, of which the following is a full, clear, and exact description.

My invention relates to improvements in bridges, especially applicable to what are known as "combination truss-bridges," and has for its object to increase the stability of such structures and economize material. Hitherto the pedestals, caps, and other connections between the various compression and tension members of this class of bridges have been made of cast-iron, which, in consequence of defective casting or the strains and vibrations of passing loads, frequently break, and thereby cause the failure of the bridge.

Now my invention consists in making these connections respectively of wrought-iron plates and angles riveted and arranged together in such a manner that the maximum strength of the material is utilized to the best advantage in resisting the various strains to which the connections are subjected.

In the accompanying drawings, Figures 1, 2, and 3 represent a side elevation, end view, and plan, respectively, of one of the pedestals for receiving the bottom-chord bars of a combination truss-bridge; Figs. 4, 5, and 6, similar views, respectively, of the connection combined with the pedestal for receiving the lower portion of the end post of the truss; Figs. 7 and 8, a side elevation and end view, respectively, of the cap for receiving the upper portion of the end post; Fig. 9, a side elevation of the connecting-piece with the cap for receiving the top chord, suspender-bars, and first diagonal tie of the truss; and Fig. 10, a plan view thereof; Figs. 11 and 12, a side and end elevation, respectively, of the cap for receiving the upper portion of the first intermediate post; and Figs. 13 and 14, a side elevation and plan, respectively, of the connection therewith for receiving the top chord and second diagonal tie of the truss; Figs. 15 and 16, a side and end elevation, respectively, of the shoe or cap for receiving the lower portion of first intermediate post, bottom-chord bars, and lower end of first diagonal of the truss; and Fig. 17, a side elevation, to a re-

duced scale, of the various parts of the truss broken away and connections referred to in Figs. 1 to 16 arranged in position, like letters of reference denoting like parts in all the figures.

According to my invention the pedestal A, Figs. 1, 2, 3, and 17, in lieu of being cast in one piece, as heretofore, is composed of a series of wrought-iron plates, a , which are arranged parallel to one another at right angles to a base-plate, a' , and secured to the latter by angles a^2 and rivets a^3 . The connecting-pin a^4 passes horizontally through the entire series of vertical plates a for receiving the connection B, Figs. 4, 5, 6, and 17, which is composed of wrought-iron plates b , secured at right angles to a base-plate, b' , by angles b^2 and rivets b^3 , which are countersunk where attached to the plate b' . The two end plates, b , extend beyond the base-plate b' , for receiving the lower end of the end post of the truss, the top cap-connection, C, Figs. 7, 8, and 17, of which is composed of plates c c' and angles c^2 , combined and secured together by rivets c^3 in a similar manner to connection B, and is hinged by the pin c^4 to the top-chord connection D, Figs. 9, 10, and 17, which is in the form of a square or rectangular cellular frame composed of vertical plates d , arranged parallel to each other and secured at their ends at right angles to similar upright plates, d' , by angles d^2 and rivets d^3 , having their external heads countersunk. On the outsides of the upright plates d' are horizontal angle-iron brackets d^4 , on which the end portions of the top-chord members are supported and secured transversely on their undersides where mortised into the connection D.

The first intermediate top-chord connection, E, Figs. 13, 14, and 17, is composed of upright plates e e' , angles e^2 , rivets e^3 , and angle-brackets e^4 , constructed and arranged in a similar manner to connection D, except that in the latter the angle-brackets d^4 are arranged for receiving transversely the end portions of the top-chord members, while in the intermediate connections, E, the angle-brackets e^4 are arranged at right angles relatively to the angle-brackets d^4 , for supporting laterally on their under sides the said chord members where mortised into the connection E, which is provided with the pin e^5 , whereon is hinged the

cap-connection F, Figs. 11, 12, and 17, which is composed of vertical double side plates, f , riveted together and at right angles to a connecting-plate, f' , by angles f^2 and countersunk rivets f^3 , a single thickness of each double side f being extended beyond the connecting-plate f' , for receiving the upper end of the intermediate post of the truss, the lower end of this post being secured to connection G, which is similar in all respects to connection F. The remaining connections throughout the entire length of a combination-truss are respectively similar in construction and arrangement to the connections A B C D E F G, above described, and as all the connections are analogous in function and location to the cast-iron connections hitherto used and well known for this class of bridges no further description is needed.

By my invention, which is equally applicable to any description of truss having independent compression and tension members in combination and interaction, the superior strength and elasticity of the wrought-iron plates and angles, which are shaped and arranged in the most advantageous manner for resisting the various strains to which the connections are subjected, render them less liable to fracture and impart a greater stability and safety to the bridge at a less cost of material than by the old method of using cast-iron.

I claim—

1. In bridge connections A B, the combination of vertical wrought-iron plates a , horizontal plate a' , and angles a^2 , all secured together by rivets a^3 , and wrought-iron plates b , secured at right angles to plate b' by angles b^2 and rivets b^3 , having countersunk heads, with connecting pin a^4 , substantially as shown, and for the purpose described.

2. In bridge-connections C D, the combina-

tion of wrought-iron plates c , secured at right angles to plate c' by angles c^2 and rivets c^3 , two of said plates c being extended beyond plate c' , vertical plates d d' , secured together by angles d^2 and rivets d^3 , having countersunk heads, and angle-brackets d^4 , with connecting-pin c^4 , substantially as shown, and for the purpose described.

3. In bridge-connection C, the combination of wrought-iron plates c , secured at right angles to plate c' by angles c^2 and rivets c^3 , two of said plates c being extended beyond plate c' , substantially as shown, and for the purpose described.

4. In bridge connection D, the combination of vertical wrought-iron plates d d' , secured together by angles d^2 and rivets d^3 , said plates d' having angle-brackets d^4 , substantially as shown, and for the purpose described.

5. In bridge-connections E F, the combination of upright wrought-iron plates e e' , angles e^2 , rivets e^3 , and angle-brackets e^4 , and vertical double plates f , secured at right angles to connecting-plate f' by angles f^2 and rivets f^3 , with connecting-pin e^5 , substantially as shown, and for the purpose described.

6. In bridge connection F, the combination of vertical double wrought-iron plates f , secured at right angles to connecting-plate f' by angles f^2 and rivets f^3 , a single thickness of said plates f being extended beyond plate f' , substantially as shown, and for the purpose described.

In testimony whereof I affix my signature, in presence of two witnesses, this 25th day of July, 1888.

HENRY S. HOPKINS.

Witnesses:

S. L. SCHRADER,
PAUL BAKEWELL.