

(No Model.)

4 Sheets—Sheet 1.

M. J. LORRAINE & F. P. WHERRY.
CAR COUPLING.

No. 418,576.

Patented Dec. 31, 1889.

Fig. 1,

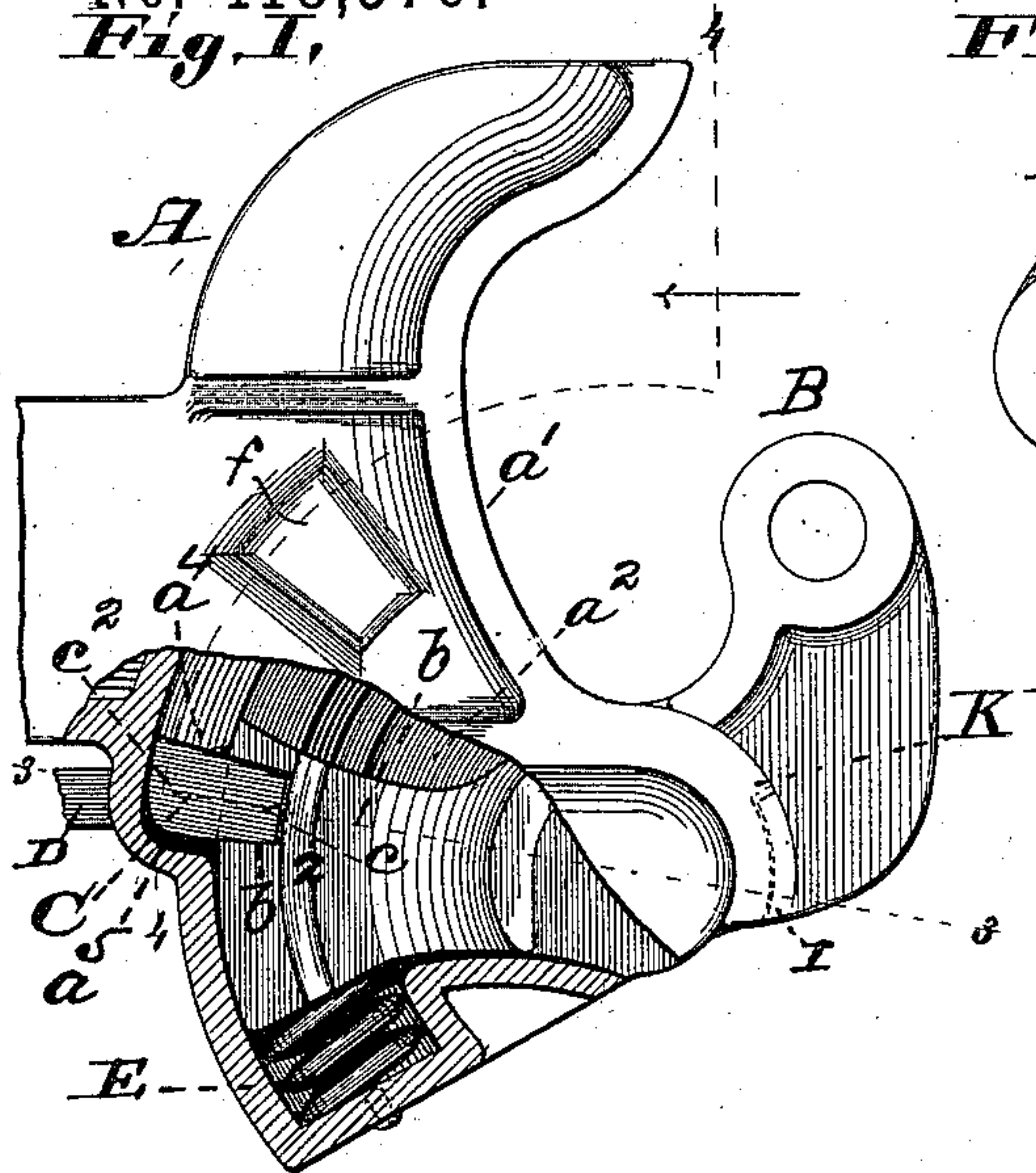


Fig. 2,

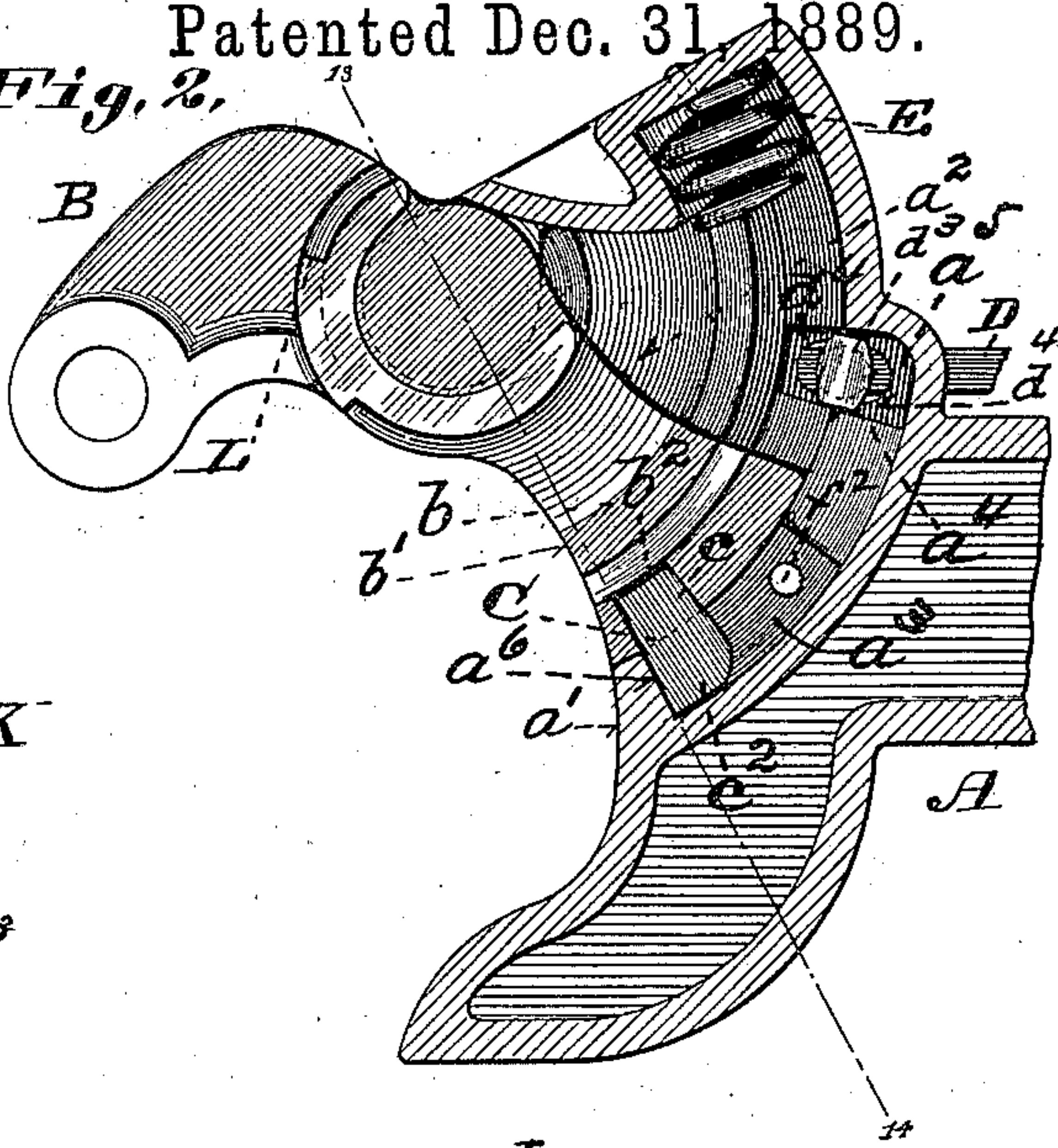


Fig. 3,

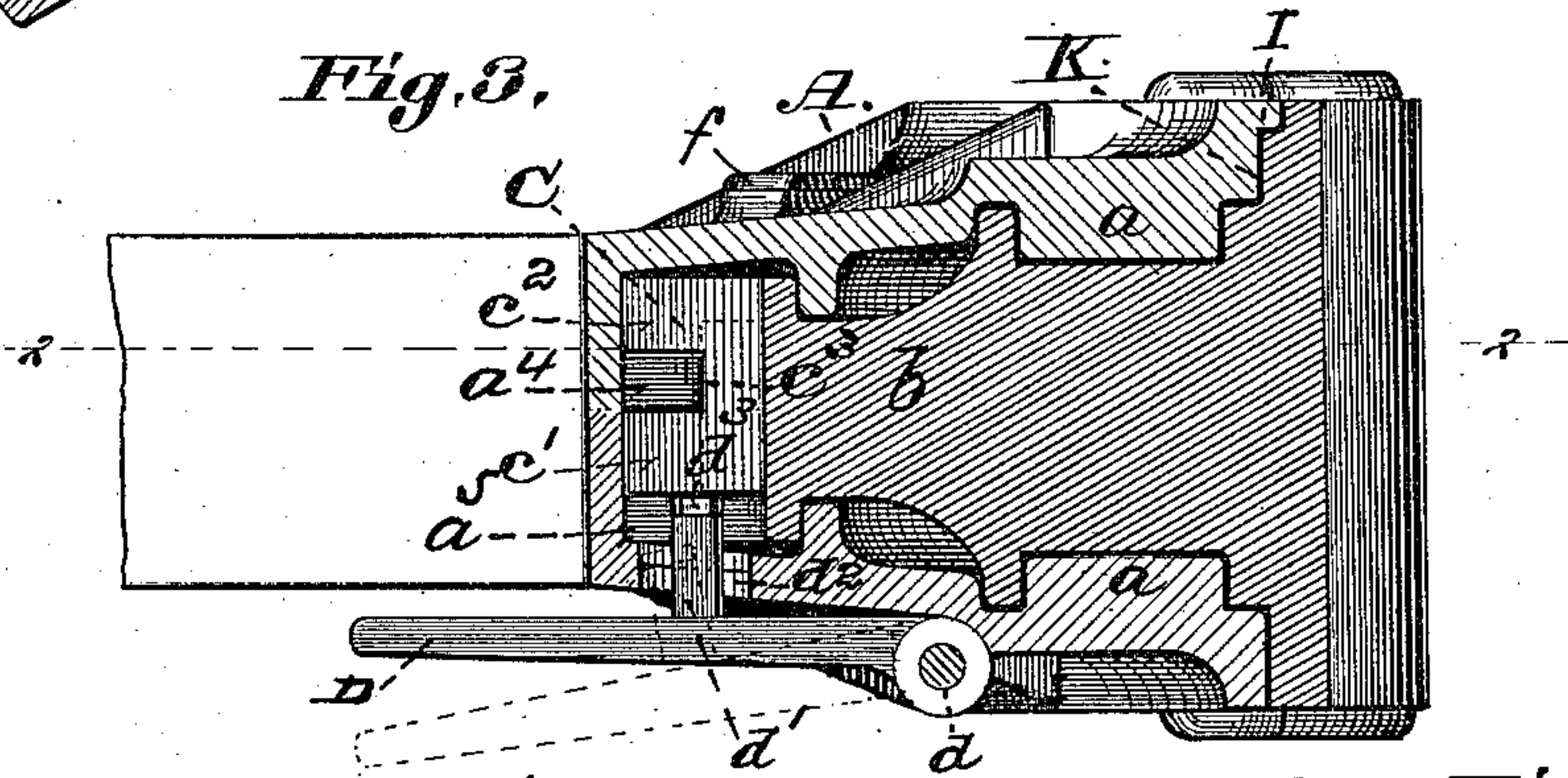


Fig. 4,

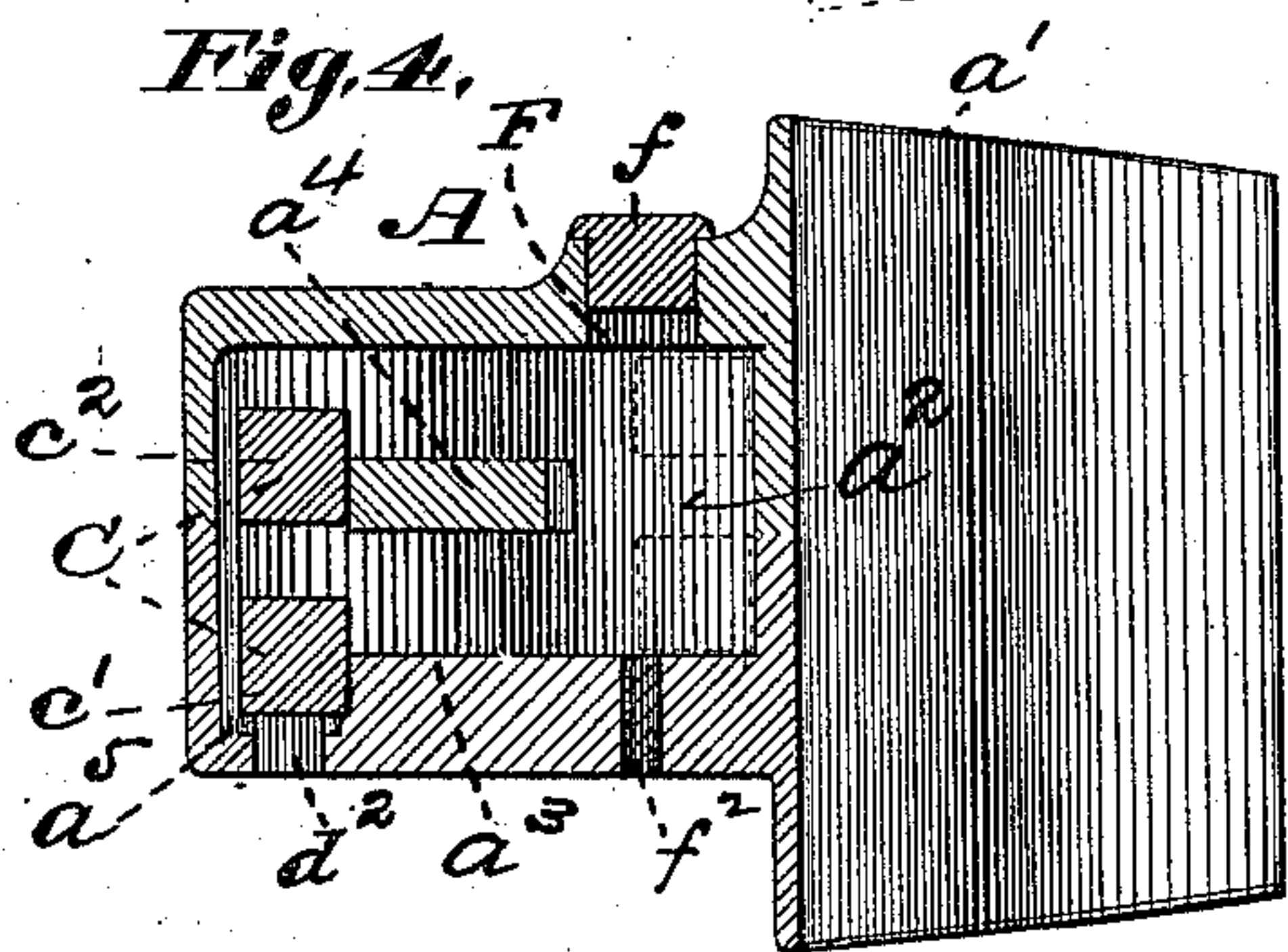
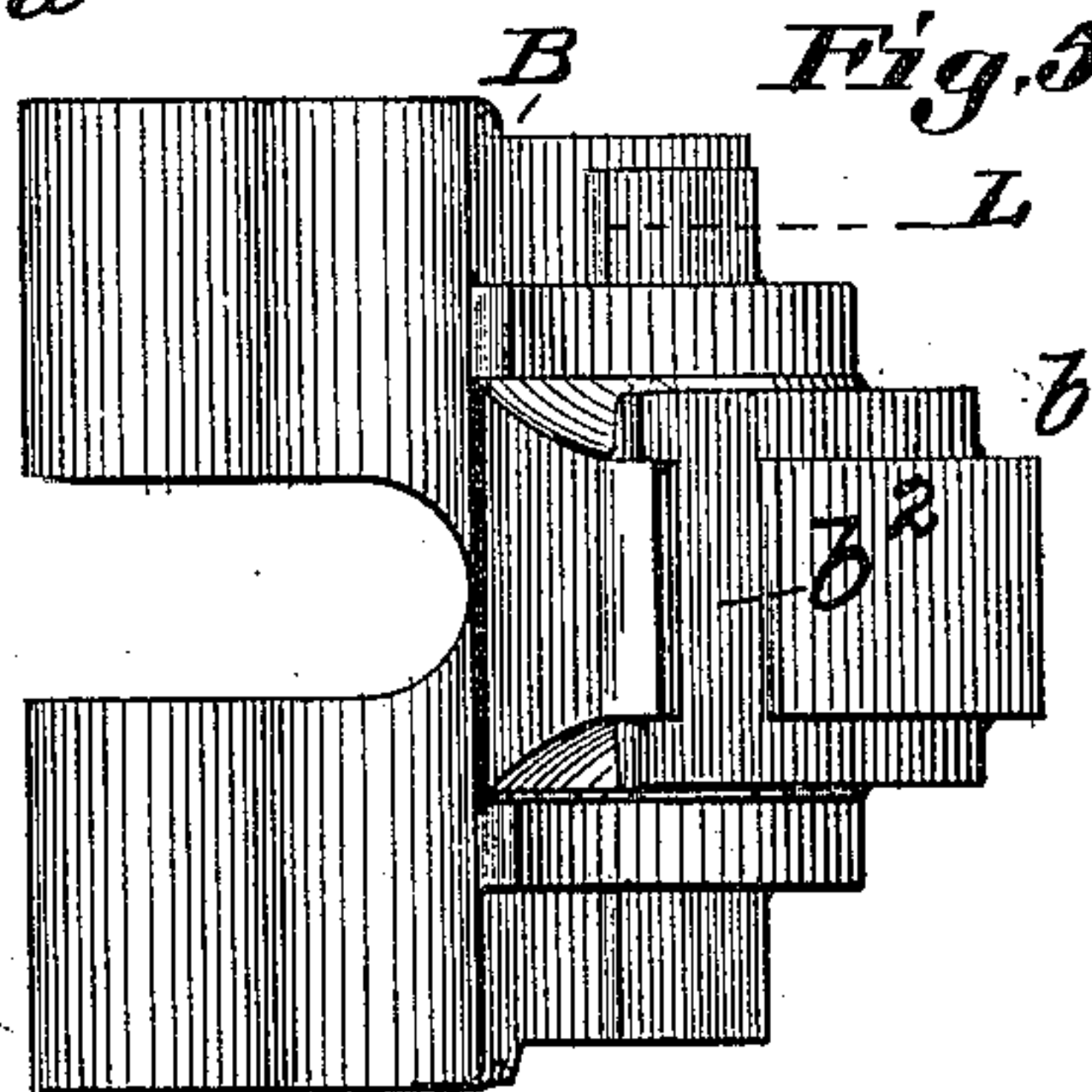


Fig. 5,



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Fig. 6

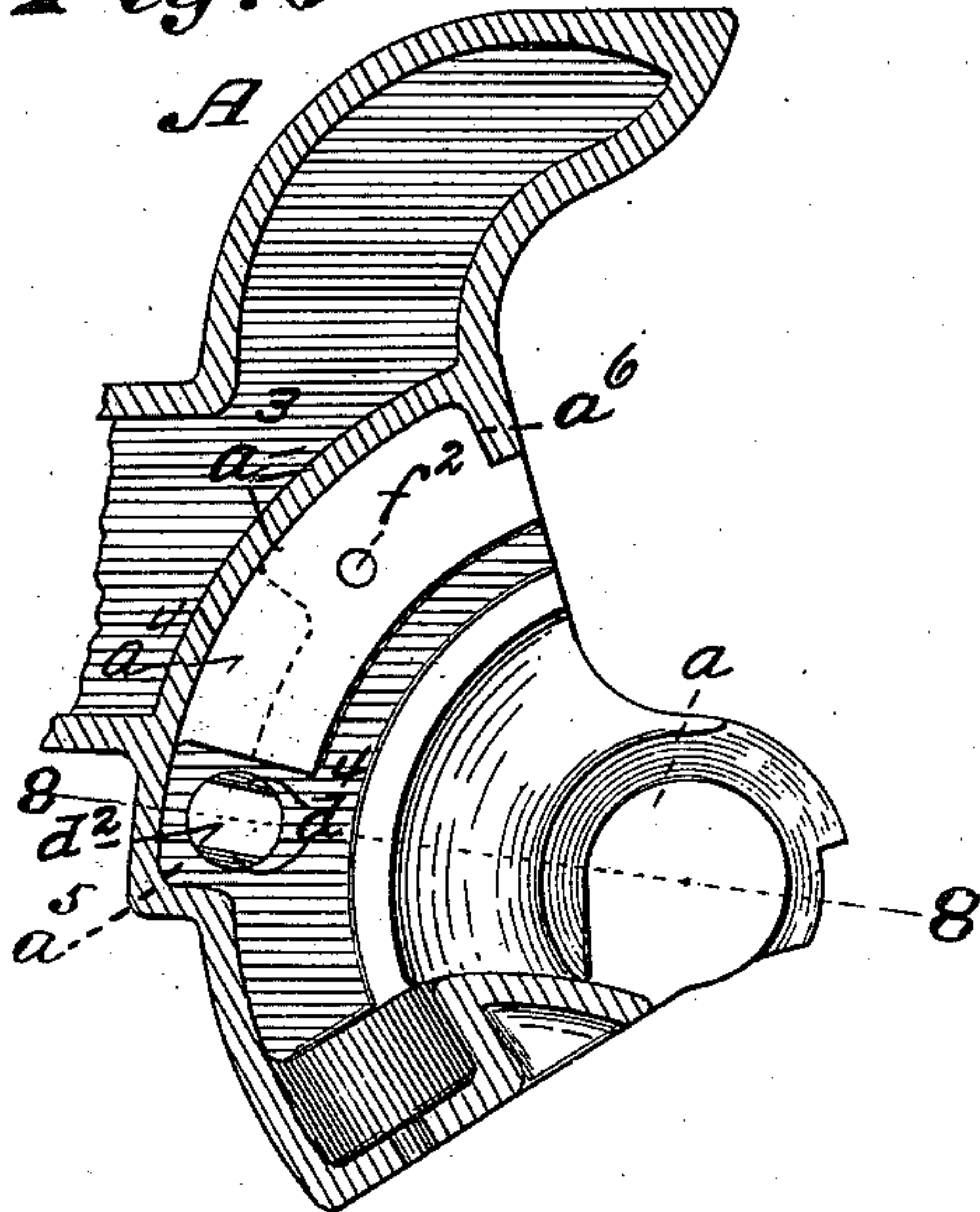


Fig. 7

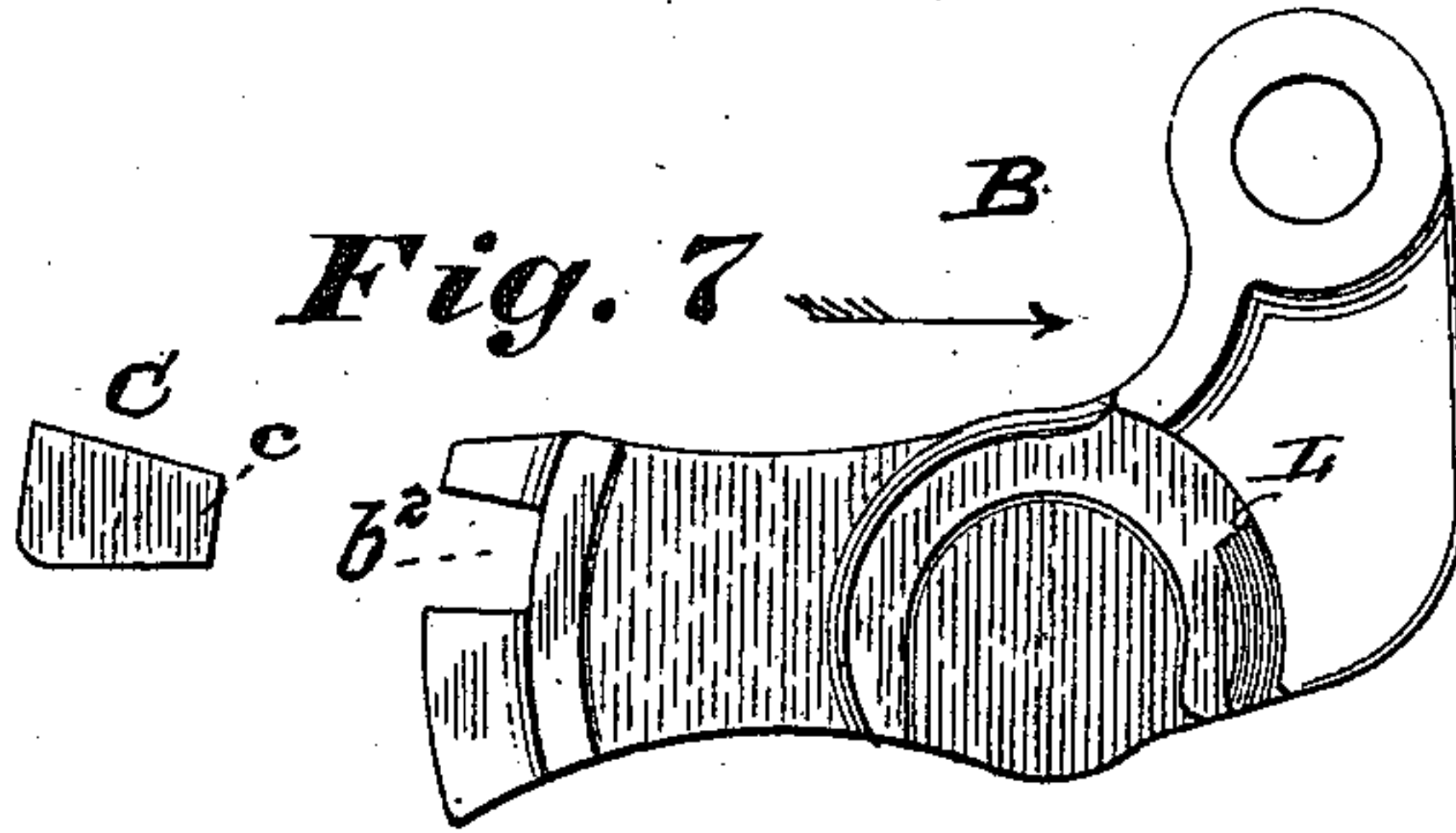


Fig. 8

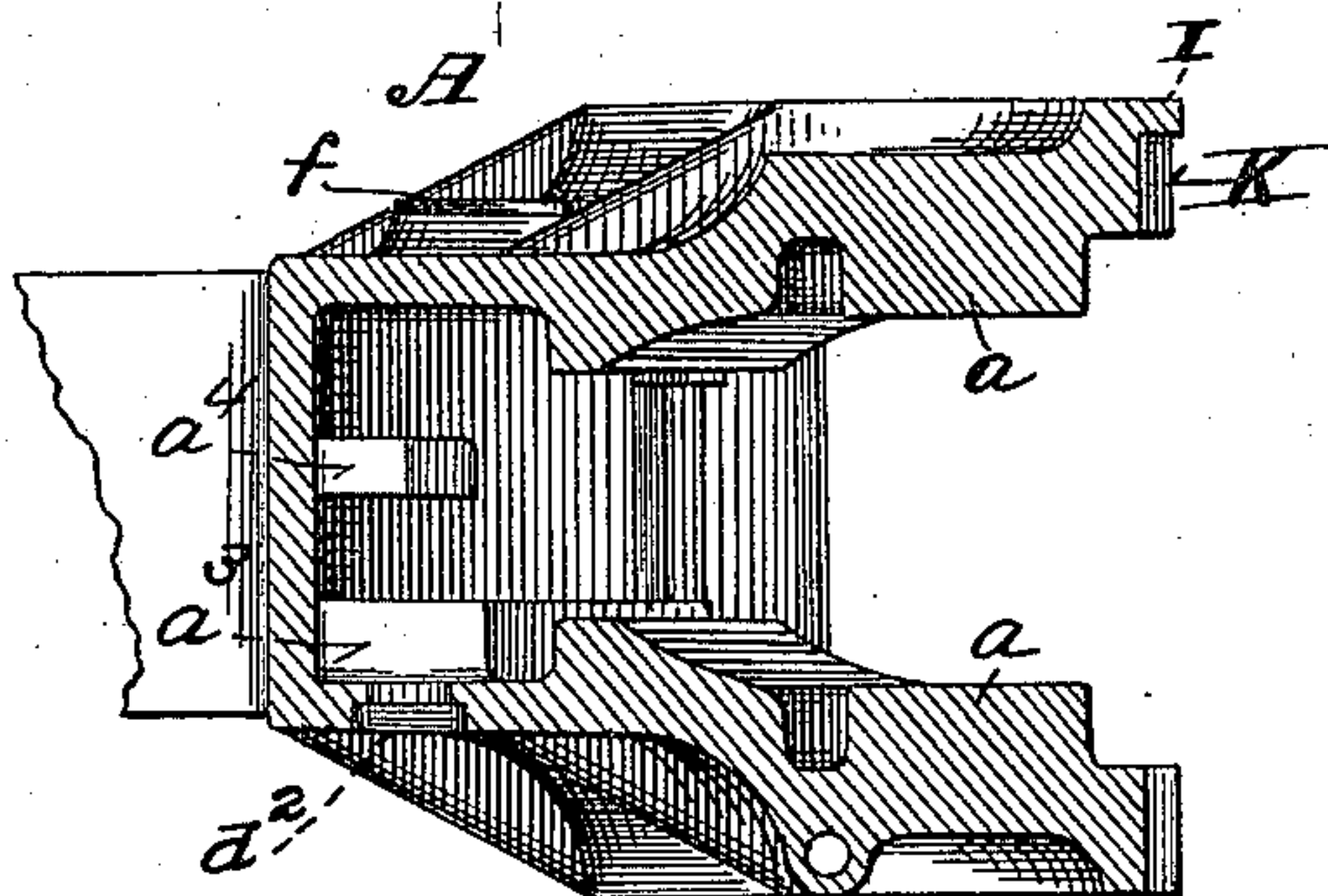


Fig. 9

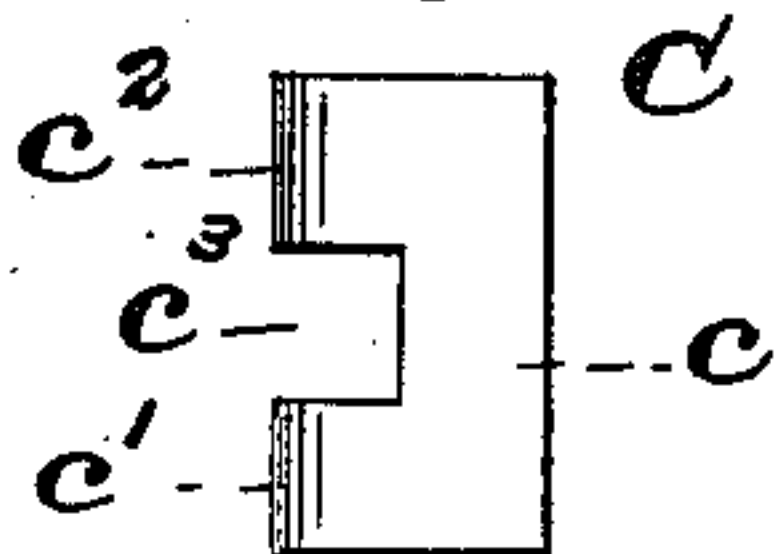
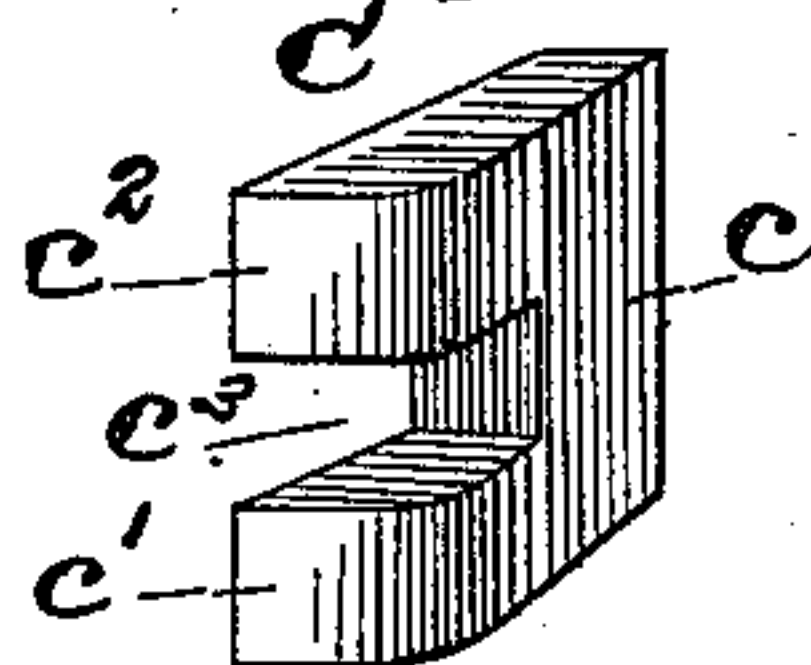


Fig. 10



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Fig. 11

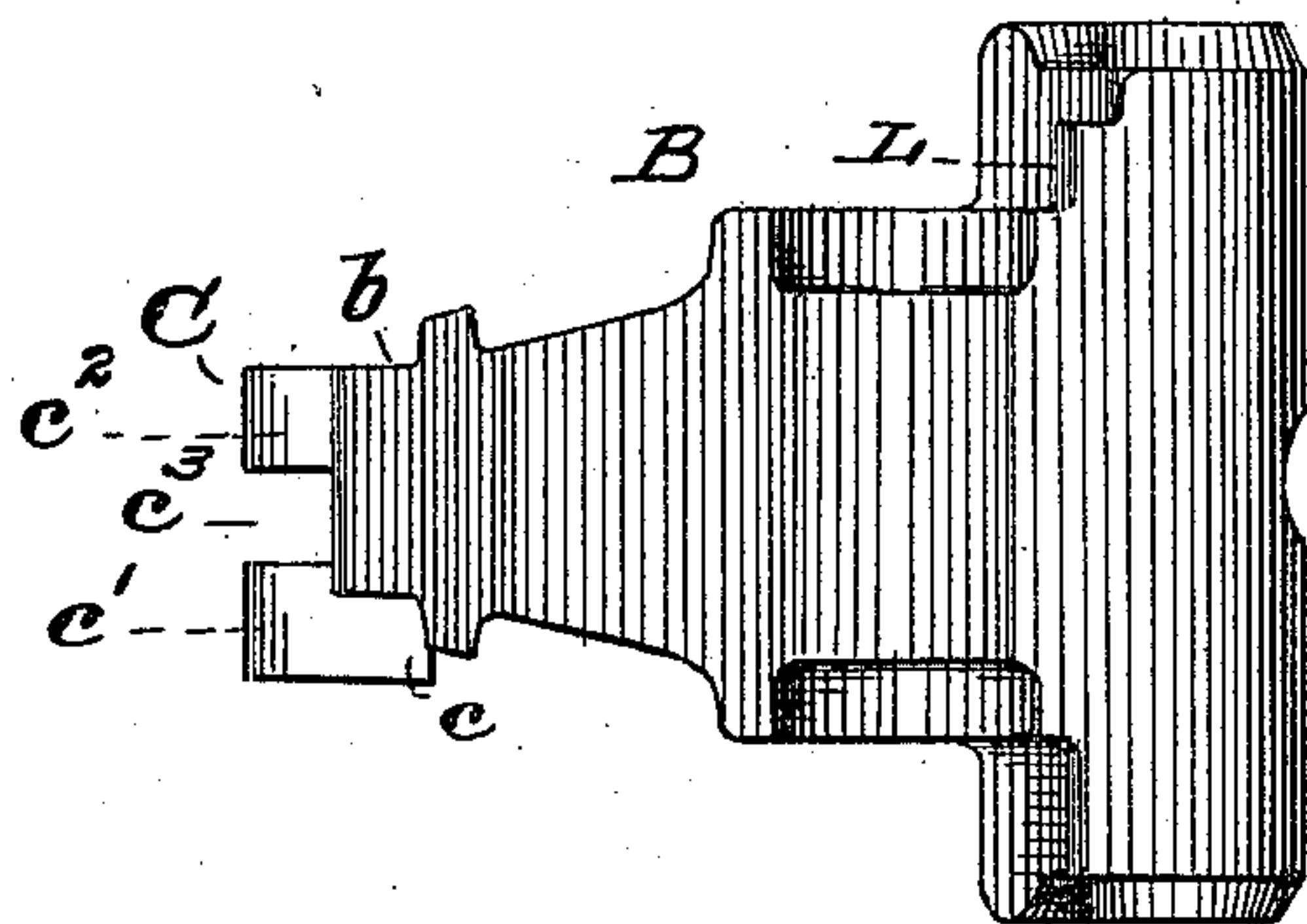
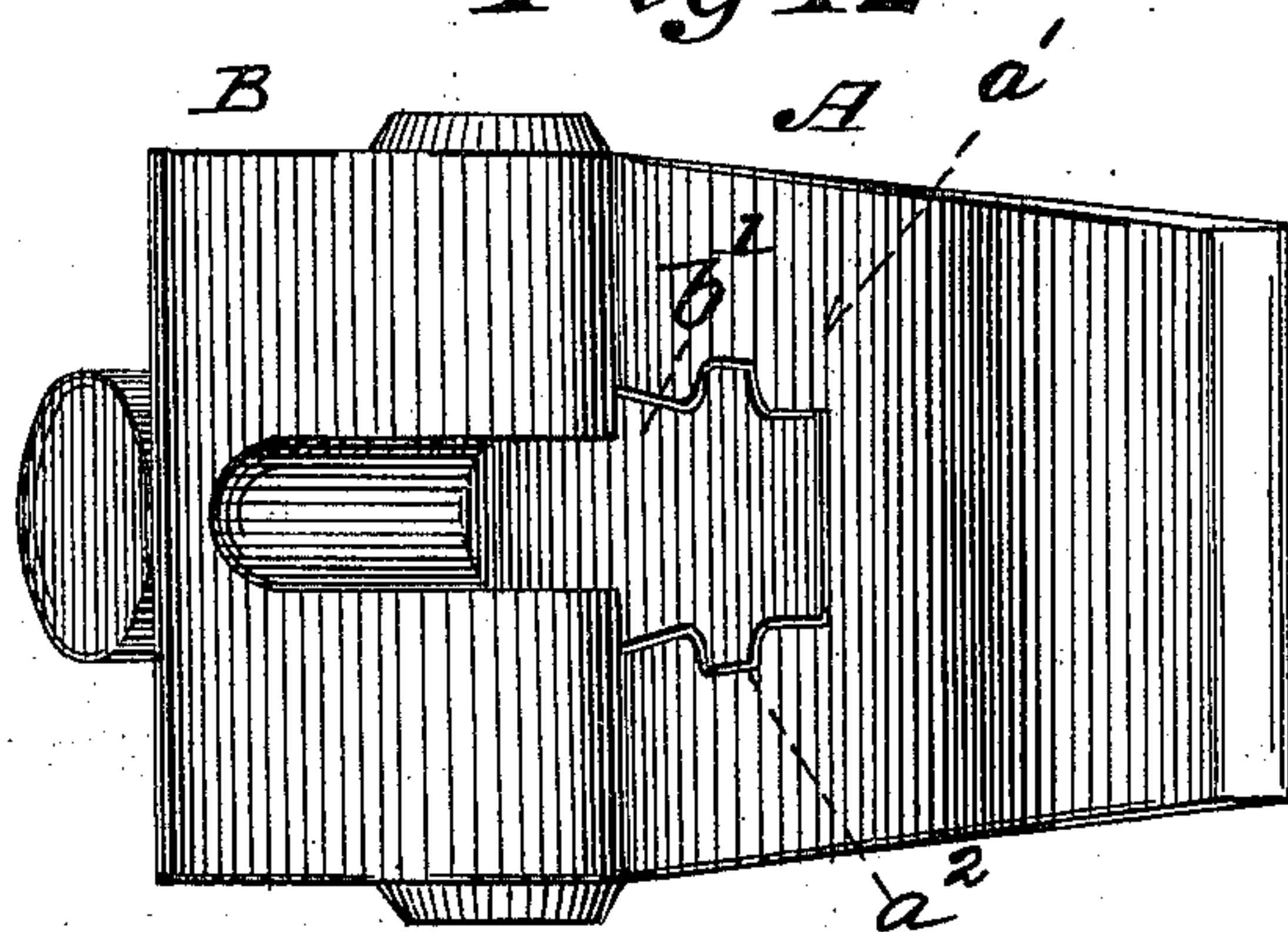


Fig 12



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Fig. 14

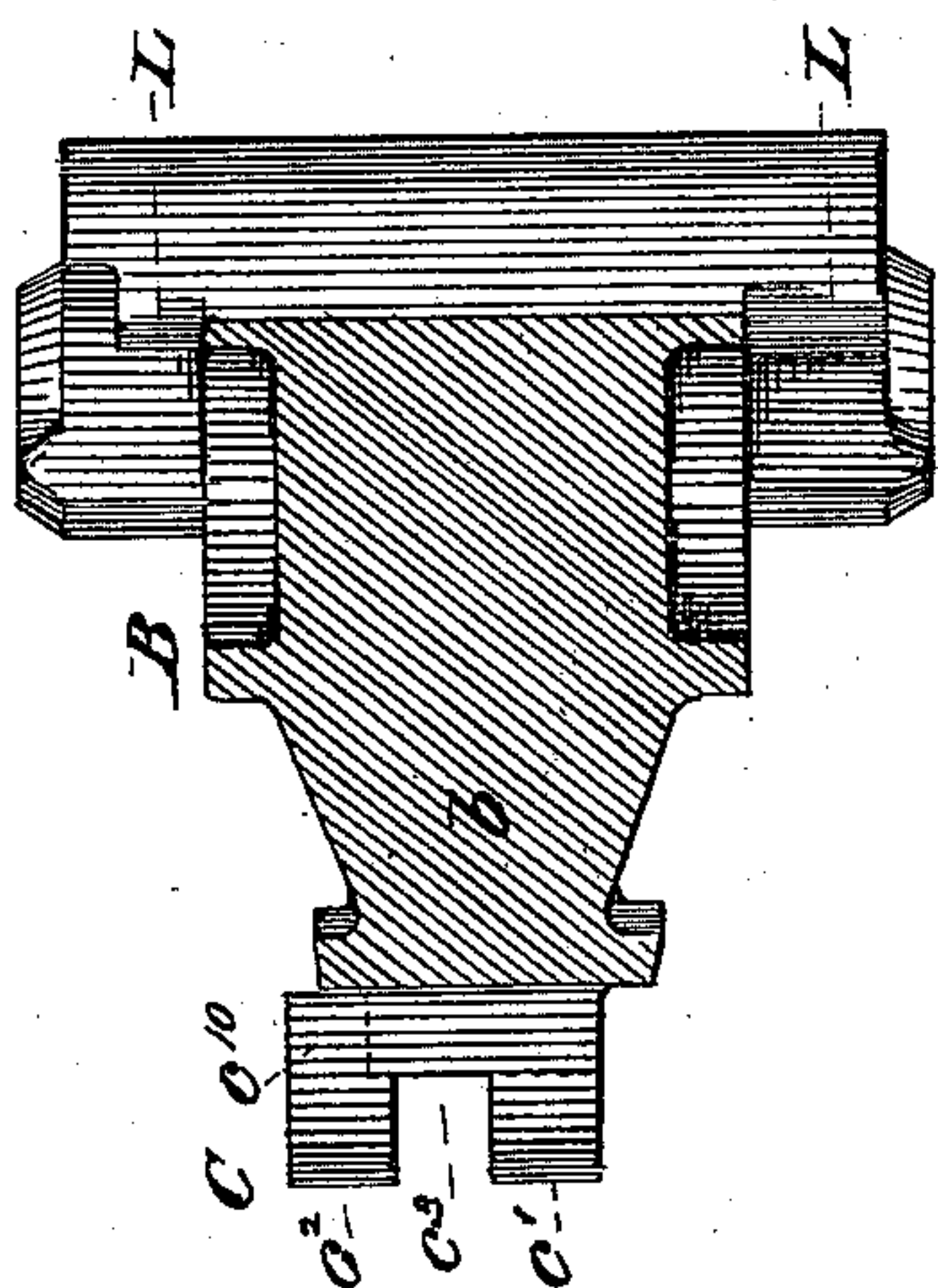
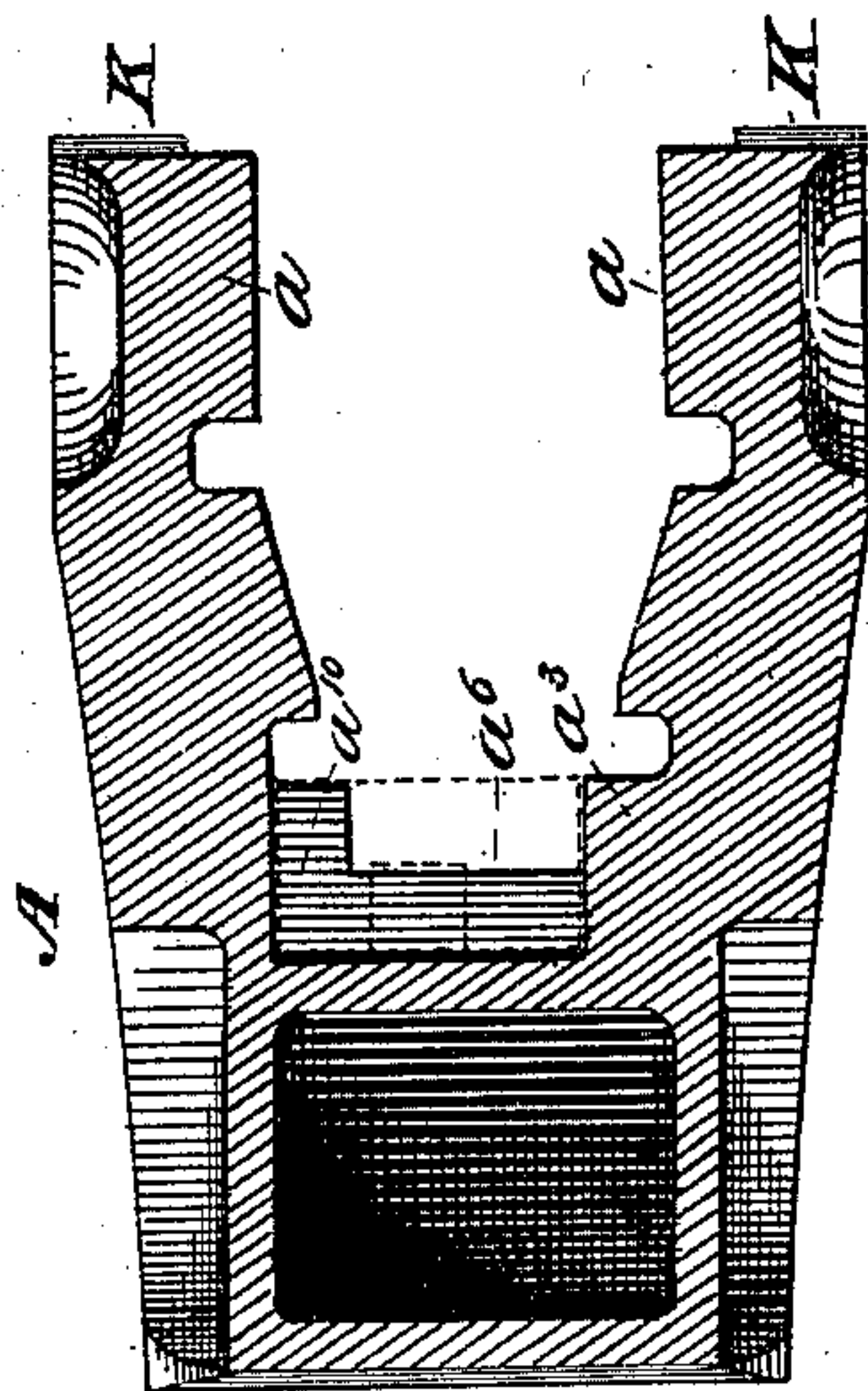


Fig. 13



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UNITED STATES PATENT OFFICE.

MADISON J. LORRAINE AND FRANKLIN P. WHERRY, OF ST. LOUIS, MISSOURI,
ASSIGNORS TO THE KEYSTONE CAR COUPLER COMPANY, OF ILLINOIS.

CAR-COUPLING.

SPECIFICATION forming part of Letters Patent No. 418,576, dated December 31, 1889.

Application filed June 24, 1889. Serial No. 315,413. (No model.)

To all whom it may concern:

Be it known that we, MADISON J. LORRAINE and FRANKLIN P. WHERRY, of St. Louis, Missouri, have jointly made a new and useful
5 Improvement in Car-Couplings, of which the following is a full, clear, and exact description.

The improvement relates to pivoted-hook car-couplings, and more especially to the locking mechanism thereof.

Other features of the improved-construction are the means for cushioning the hook after it is closed and the means for more effectually closing at the upper end thereof
15 the joint between the draw-head and the hook, the means by which the hook of the opposing coupling part is prevented from getting in the rear of the inner arm of the hook, the means for closing the hook-recess in the
20 draw-head when the hook is opened, and the improved unlocking mechanism, all substantially as is hereinafter set forth and claimed, aided by the annexed drawings, making part of this specification, in which—

25 Figure 1 is a plan, partly in section, of the improved coupling, the hook being closed, but not locked; Fig. 2, a horizontal section on the line 2 2 of Fig. 3, the hook being unlocked and opened; Fig. 3, a vertical longitudinal
30 section on the line 3 3 of Fig. 1; Fig. 4, a vertical section on the line 4 4 of Fig. 1, the lock being dropped to engage with the shoulders within the draw-head. The dotted lines indicate the position of the lock when the hook is opened.
35 The direction of the view is indicated by the arrow in Fig. 1. Fig. 5 is an elevation of the hook, looking in the direction of the arrow in Fig. 7; Fig. 6, a horizontal section of the draw-head on the line 6 6 of Fig. 8; Fig. 7,
40 a plan of the hook and lock, the lock being properly presented to the hook, but detached therefrom; Fig. 8, a vertical section of the draw-head on the line 8 8 of Fig. 6; Fig. 9, a side elevation of the lock; Fig. 10, a view in
45 perspective of the lock; Fig. 11, an elevation of the hook from the outer side thereof. The view includes the lock. Fig. 12 shows the front end elevation of the coupling opened. Fig. 13 is a vertical section of the draw-head
50 on the line 13 14 of Fig. 2, and Fig. 14 is a

vertical section of the hook on the line 13 14 of Fig. 2. The view includes the lock in elevation.

The same letters of reference denote the same parts.

This improved coupling is composed, 55
mainly, of the following parts: the draw-head A, the hook B, the lock C, for fastening the hook in its closed position, the lever D, for lifting the lock when it is desired to open
60 the hook, and the spring-buffer E, for cushioning the hook after it is closed—that is, these parts, respectively constructed substantially as is hereinafter set forth and shown, when assembled, constitute the coupling in
65 its most complete form. Of these parts the spring-buffer, while a very desirable element in many varieties of pivoted-hook car-couplings and of especial value in the present
70 construction, is not essential to the working of the other enumerated parts, and the lock can be used to secure the hook in its closed position irrespective of any particular means
75 for adjusting the lock so as to release the hook. Further, the coupling, saving as it is modified or supplemented by the improvement under consideration, may be of any of
80 the ordinary forms of pivoted-hook car-couplings so long as those forms permit of the embodiment therein of the improvement. The preferred forms are exhibited in the drawings. The hook is pivoted to the draw-head
85 by journaling it upon the bearings *a a*, Fig. 3, of the draw-head, and so that the hook can be swung around into its closed position (shown in Fig. 1) or into its opened position. (Shown in Fig. 2.)

The general contour of the coupling, when the hook is closed, is, as seen in Fig. 1, preferably in accordance with the "Master Car
90 Builder's Standard." A desirable feature, however, of the construction is the relation of the inner arm *b* of the hook to the draw-head in all positions of the hook. The draw-head and the hook are so constructed and combined that the hook-arm *b* is always within the
95 draw-head. Even when the hook is opened, as in Fig. 2, the arm *b* does not project in front of the face *a* of the draw-head, and in consequence of this arrangement the hook of
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the opposing coupling cannot and does not encounter the hook-arm b as the cars come together. The opposing hook therefore can neither injure the arm b by striking it nor 5 displace it by passing to the rear thereof. The preferable arrangement of all in the respect under consideration is to have the outer face b' of the hook-arm b come, when the hook is opened, substantially flush with 10 the face a' of the draw-head, as thereby the hook-arm b serves, when the hook is opened, to substantially close the entrance to the recess a^2 in the draw-head, in which the hook-arm b works, and thus to practically exclude 15 anything calculated to interfere with the working of the hook-arm or lock.

Another feature of the construction is the means for locking the hook when closed. The hook-arm b is provided with a part 20 termed herein the "lock" C , which in the movement of the hook travels with the hook-arm b , and this lock, the hook-arm, and the draw-head are all so relatively contrived that when the hook has been closed the lock 25 moves, or can be moved, so as to cause the hook-arm to become interlocked with some fixed part of the draw-head, and thus for the time being secure the hook in its closed position, and to release the hook, so that it can 30 be opened, the lock must be moved back again into its original position, after which the hook can be turned on its pivot, and as it is turned the lock is carried along with the hook-arm b toward the entrance to the recess a^2 —that is, the lock is always in en- 35 gagement with the hook-arm b , and when the hook is closed the lock is also in engagement with the draw-head; but when the hook is not closed the lock is in engagement with the hook-arm only, saving at the outer end of the hook-arm movement, as hereinafter 40 described. As the most desirable mode of effecting this engagement of the hook-arm with the draw-head the following construction is adopted: The hook-arm b is notched 45 vertically at b^2 , Figs. 1, 2, and 7, to receive the lock C , which is shown in Figs. 1, 2, 3, and 4, but more distinctly in Figs. 9 and 10. The end c of the lock enters the notch b^2 , and the opposite 50 end of the lock consists of the projections c' c^2 , separated by the notch c^3 . The lock can be raised and lowered in the notch b^2 . The projections c' c^2 coact, respectively, with the shoulders a^3 a^4 upon the draw-head, to which 55 end the draw-head is so constructed and the shoulders so arranged that a space a^5 , Figs. 1, 2, 3, 4, and 6, is provided in the draw-head, in which the lock can be adjusted vertically when the hook is in its closed position. 60 When the hook is in its closed position, Fig. 1, the lock, owing to its gravity, drops in the notch b^2 and space a^5 , and the projections c' c^2 are thereby respectively brought more or less into the planes, respectively, of the shoulders a^3 a^4 , Fig. 4, and the hook becomes 65 locked. To open the hook, the lock is raised in the space a^5 and notch b^2 until the lower

projection c' is above the level of the lower shoulder a^3 and the upper projection c^2 is above the level of the upper shoulder a^4 , Fig. 3. 70 The hook can now be turned on its pivot, and as the hook opens the lock rides upon the lower shoulder a^3 , which is extended, as shown in Fig. 6, sufficiently to support the lock, even when the hook is fully opened. As the lock is thus 75 carried along with the hook-arm b the upper shoulder comes in the notch c^3 between the projections c' c^2 of the lock. When the hook is fully opened, the lock projections encounter the shoulder a^6 , Figs. 2 and 6, upon the 80 draw-head, and the hook is thereby prevented from turning farther around on its pivot and the hook-arm b from projecting outward in front of the draw-head. When the hook is being closed, the lock rides upon the shoul- 85 der a^3 until the space a^5 is reached, when it drops again, as described. We desire not to be restricted to this particular mode of constructing and operating the lock, so that it shall, when the hook is closed, come into en- 90 gagement with some fixed shoulder upon the draw-head, so long as the lock is made to travel with the hook-arm b in the movement of that part and to be shifted at the inner terminus of said movement to engage with 95 both the draw-head and the hook-arm, for the purpose set forth. Nor, so far as a traveling and adjustable lock is concerned, do we wish to be restricted to a pivoted hook whose inner arm b does not, when the hook is opened, 100 project in front of the draw-head. When the lock is raised, it projects above the hook-arm, forming a horizontal shoulder c^{10} , which is designed to strike against a corresponding horizontal shoulder a^{10} , Fig. 13, at the mouth of 105 the draw-head when the hook is fully opened. A vertical shoulder a^6 , Figs. 2, 6, and 13, is also constructed at the mouth of the draw-head, extending downward from the horizontal shoulder c^{10} , Fig. 14. This vertical shoul- 110 der is adapted to receive that part of the lock which projects beyond the rear face of the hook-arm. The two shoulders a^{10} a^6 thus act together upon the lock and form a perfect 115 obstacle to the further opening of the hook. The preferable means for raising the lock when it is desired to open the hook is the lever D , Figs. 1 and 3. This lever is pivoted to the draw-head at d , and its movement is indicated by the broken lines, Fig. 3. It is 120 provided with a projection d' , which extends upward through an opening d^2 in the bottom of the draw-head recess a^2 to enter the space a^5 . When the lock drops, as described, in said space a^5 , it rests upon the top of the pro- 125 jection d' , and by upturning the lever D the lock can be raised to clear the draw-head shoulders, as described. The upper end d^3 of the projection d' is widened, as shown in Figs. 2 and 3, to project laterally above the 130 ledges d^4 of the draw-head, and thus prevent the projection d' and lever D from dropping, so as to disengage the projection d' from the opening d^2 when the lever D is released. The

lever D is preferably made to ride free upon any lever which may be attached to the car-body (not shown) for the purpose of operating the lever D from the side or top of the car.

5 The spring-buffer E is not designed for cushioning the hook-arm *b* as the hook is being closed, nor for turning or assisting to turn the hook outward when it is desired to open the hook. Its sole function is to provide an elastic wall or shoulder in the place of a rigid one for the hook-arm to work against after the coupling has been effected. The hook-arm does not necessarily press against the buffer after the hook is closed and
10 locked; but in case the hook is jammed against the opposing hook or any obstruction to cause its arm *b* to be moved inward beyond its locking-point it encounters a yielding abutment, and is thus kept from breaking.
20 The lock is in practice introduced into the recess in the draw-head through an opening F, Fig. 4, in the top of the draw-head. The opening is then closed by means of a removable cover *f*. There is no other opening in the top of the draw-head, and as the hook-arm *b* or the hook of the opposing coupling protects the front of the draw-head the recess in the draw-head, in which the hook-arm *b* works, is practically guarded against the entrance of dirt or moisture. By introducing a thrust-pin upward through the perforation *f*², Figs. 2 and 4, in the shoulder *a*³, which in practice constitutes the bottom of the recess *a*⁵, the lock and cover *f* can be raised out of
30 the draw-head.
35

I represents a hood projecting from the upper surface of the upper ear of the draw-head. It serves, when the hook is opened, to prevent the entrance of dirt and moisture between the two shoulders K and L on the draw-head and hook, respectively.

A locking-piece divided horizontally into sections will not answer our purpose. In the working of a car-coupling such a locking-piece fails to hold the hook in place. The locking-piece must be a rigid part, bearing, when the hook is locked, against the draw-head both above and beneath the center, vertically considered, of the hook-arm, and thereby preventing the hook-arm from canting.
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We claim—

1. The combination of the draw-head, the pivoted hook, and the jointless rigid lock, said lock traveling with the hook-arm and by bearing against the draw-head both above and beneath the center of the hook-arm interlocking the hook-arm and the draw-head when the hook is closed, as described.
55

2. The combination of the draw-head, the pivoted hook, and the jointless rigid lock, said lock traveling with the hook-arm and by bearing against the draw-head both above and beneath the center of the hook-arm interlocking the hook-arm and draw-head both when the hook is closed and when it is opened, as described.
60
65

3. The combination of the draw-head, piv-

oted hook, and the lock, said lock traveling with the hook-arm and projecting rearwardly beyond the end thereof, and said projection interlocking the hook-arm and draw-head when the hook is closed. 70

4. The combination of the draw-head, the pivoted hook, and the jointless rigid lock traveling with and adjustable upon the inner arm of said hook, said draw-head having a space to admit a portion of said lock when said hook is closed, and also having a shoulder against which said lock portion comes when adjusted upon said hook-arm, as described. 75
80

5. The combination, in a car-coupling, of the hook-arm and the lock, said hook-arm being slotted, and said lock being adjustable in said slot, for the purpose described. 85

6. The combination of the draw-head, the pivoted hook, the jointless rigid lock traveling with and adjustable upon the inner arm of said hook, and the lock-moving lever, substantially as described. 90

7. The combination of the draw-head, the pivoted hook, and the spiral-spring buffer, said buffer being incased within the draw-head in the path of the backward movement of the hook-arm, and being arranged, as described, to enable said hook to be locked before its inner arm encounters the buffer, and said draw-head and hook near the point where the hook is pivoted having shoulders K L to limit the inner rotary movement of the hook beyond the point it is desired to compress the spring, thus preventing the spring and the draw-head from breaking, as described. 95
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8. The combination of the draw-head, the pivoted hook having the slotted inner arm, and the lock notched as described and traveling with and adjustably held in said inner arm, said draw-head being recessed to admit said inner arm and a portion of said lock, and having the shoulders for said lock portion to come against when said hook is closed, as described. 105
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9. The combination of the draw-head, the pivoted hook having the slotted inner arm, and the adjustable lock traveling with said inner arm, said draw-head having the shoulder *a*³ for said lock to encounter and also to ride upon, as described. 115

10. The combination of the draw-head and the pivoted hook, said draw-head at the point at which said hook is pivoted having shoulders to limit the inward rotary movement of said hook, and also having a protecting-hood, substantially as described. 120

11. The combination of the draw-head, the pivoted hook, and the lock traveling with and adjustable upon the inner arm of said hook, said draw-head having a space to allow a further inward movement of said lock when said hook is closed, and also having a shoulder against which said lock portion comes when adjusted upon said hook-arm, as described. 125
130

12. The combination of the draw-head, the pivoted hook, the lock traveling with and ad-

justable upon the inner arm of said hook, and the lock-moving lever movably attached at one end to the draw-head, said lever having a stem whose upper end has a widened head, and said stem working in a perforation in the bottom of the draw-head, and said head supported upon ledges therein, substantially as described.

13. The combination of the draw-head, pivoted hook, and lock, said lock, when the hook is unlocked, projecting both above and rearwardly beyond the inner arm of said hook for the purpose of interlocking the hook-arm and draw-head when the hook is open and preventing the further outward movement of the hook-arm, as described.

14. The combination of the draw-head, the pivoted hook, the lock, and the lock-moving lever, said lever having a stem with the upper end having a head, said stem working in

a perforation in the bottom of the draw-head, and said head being supported by ledges on the floor of the draw-head, substantially as and for the purpose set forth.

15. The combination of the draw-head, the pivoted hook, the lock, and the spring-buffer, said lock, when the hook is closed, serving to keep the hook from opening, and said buffer serving to cushion the hook against any buffering strain after it is locked, but not offering any resistance to the hook until after it is locked, substantially as described.

Witness our hands this 20th day of June, 1889.

MADISON J. LORRAINE.
FRANKLIN P. WHERRY.

Witnesses:

C. D. MOODY,
D. W. C. SANFORD.