

No. 630,132.

Patented Aug. 1, 1899.

W. B. THOMAS.  
CAR COUPLING.

Application filed Mar. 12, 1898.

(No Model.)

4 Sheets—Sheet 1.

Fig. 1

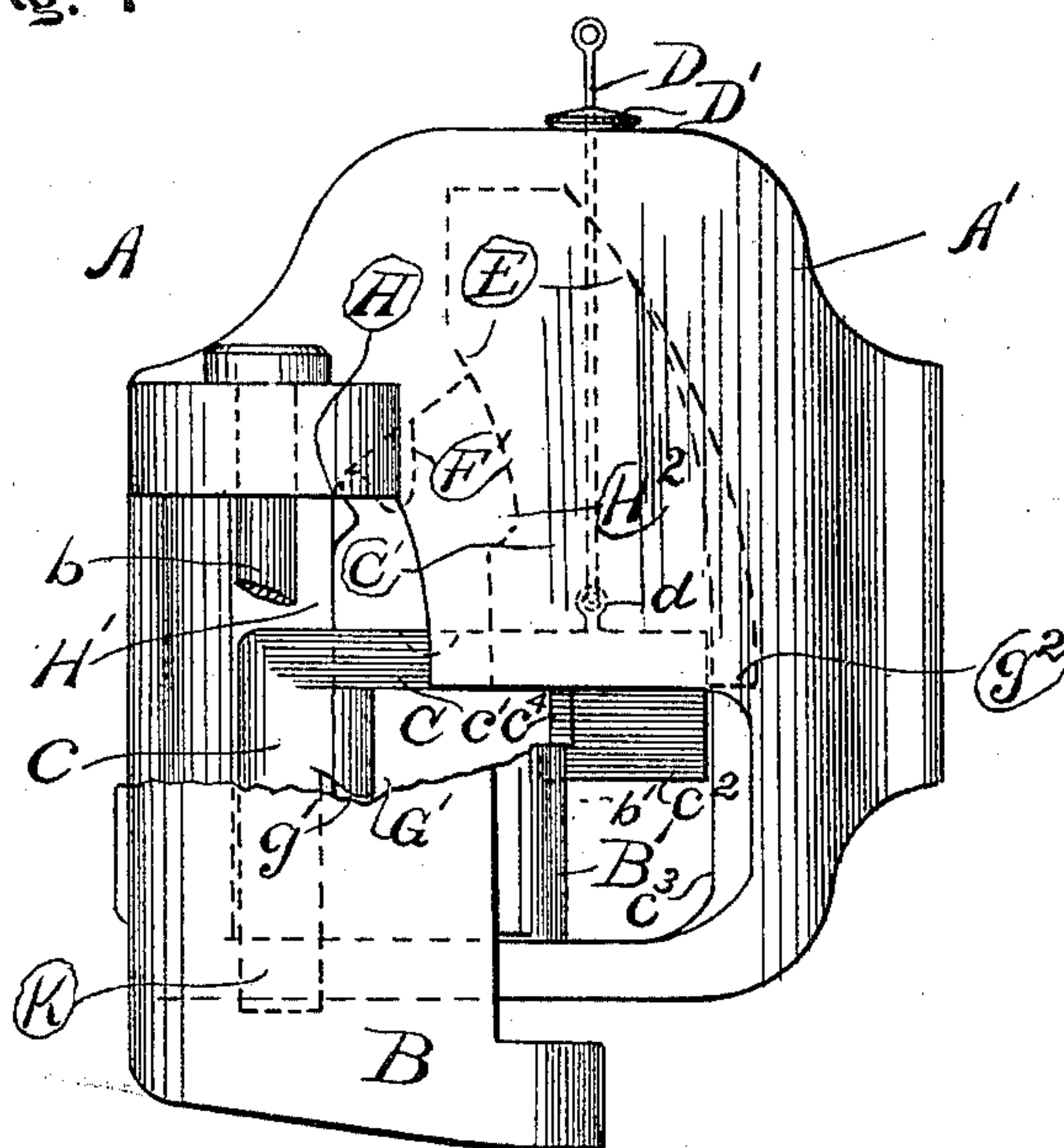
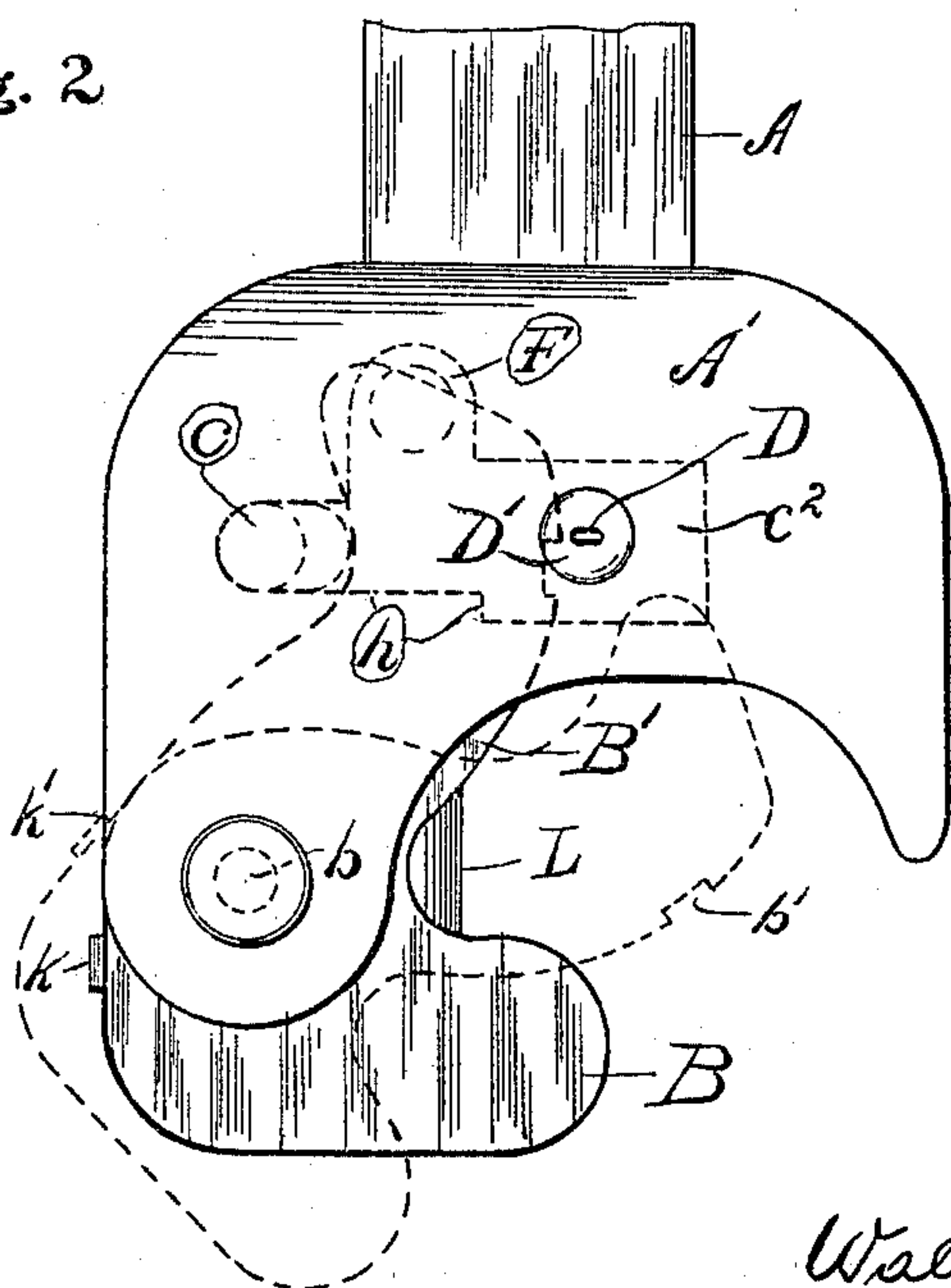


Fig. 2



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by B. Singer.  
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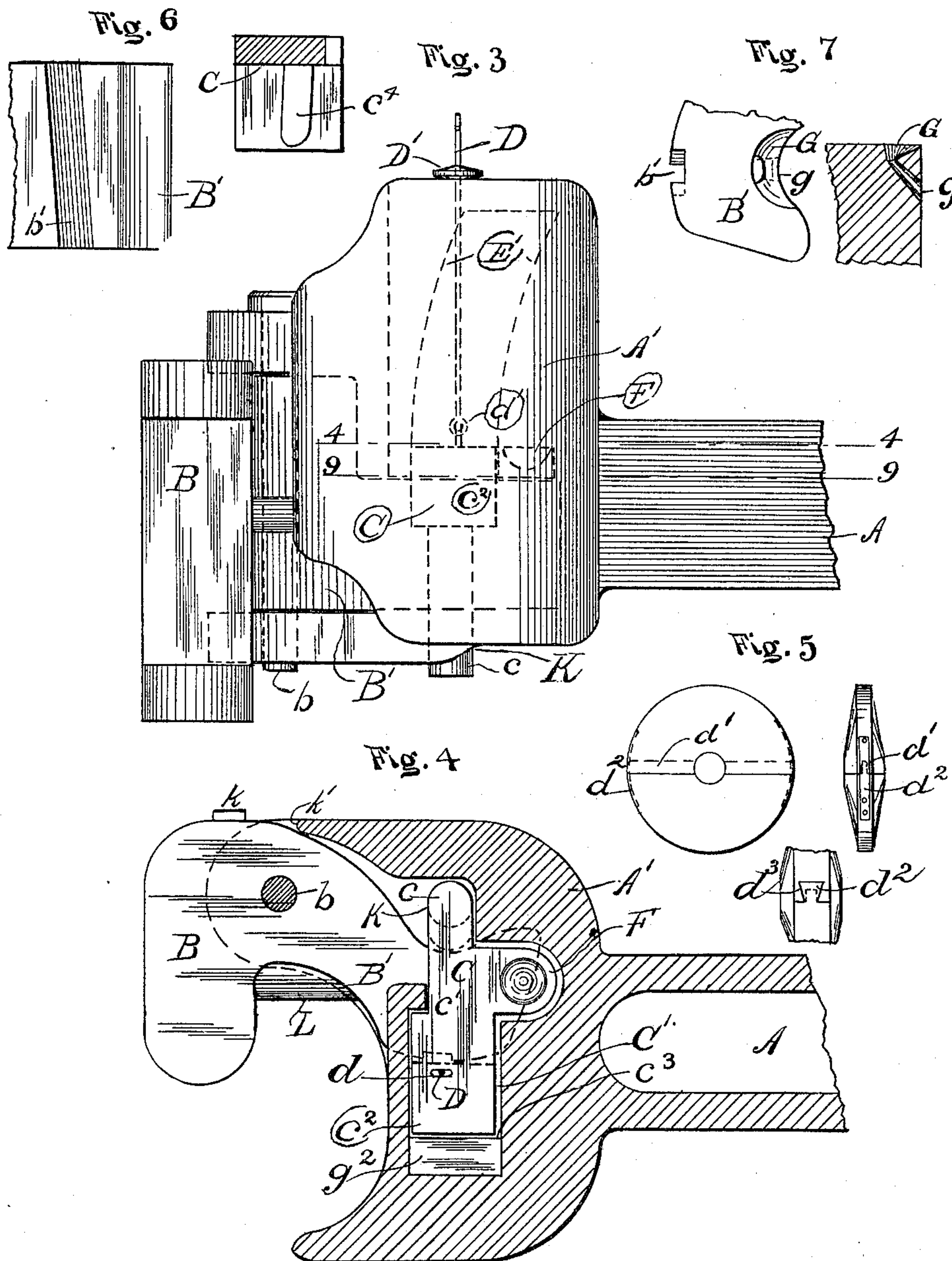
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4 Sheets—Sheet 3.

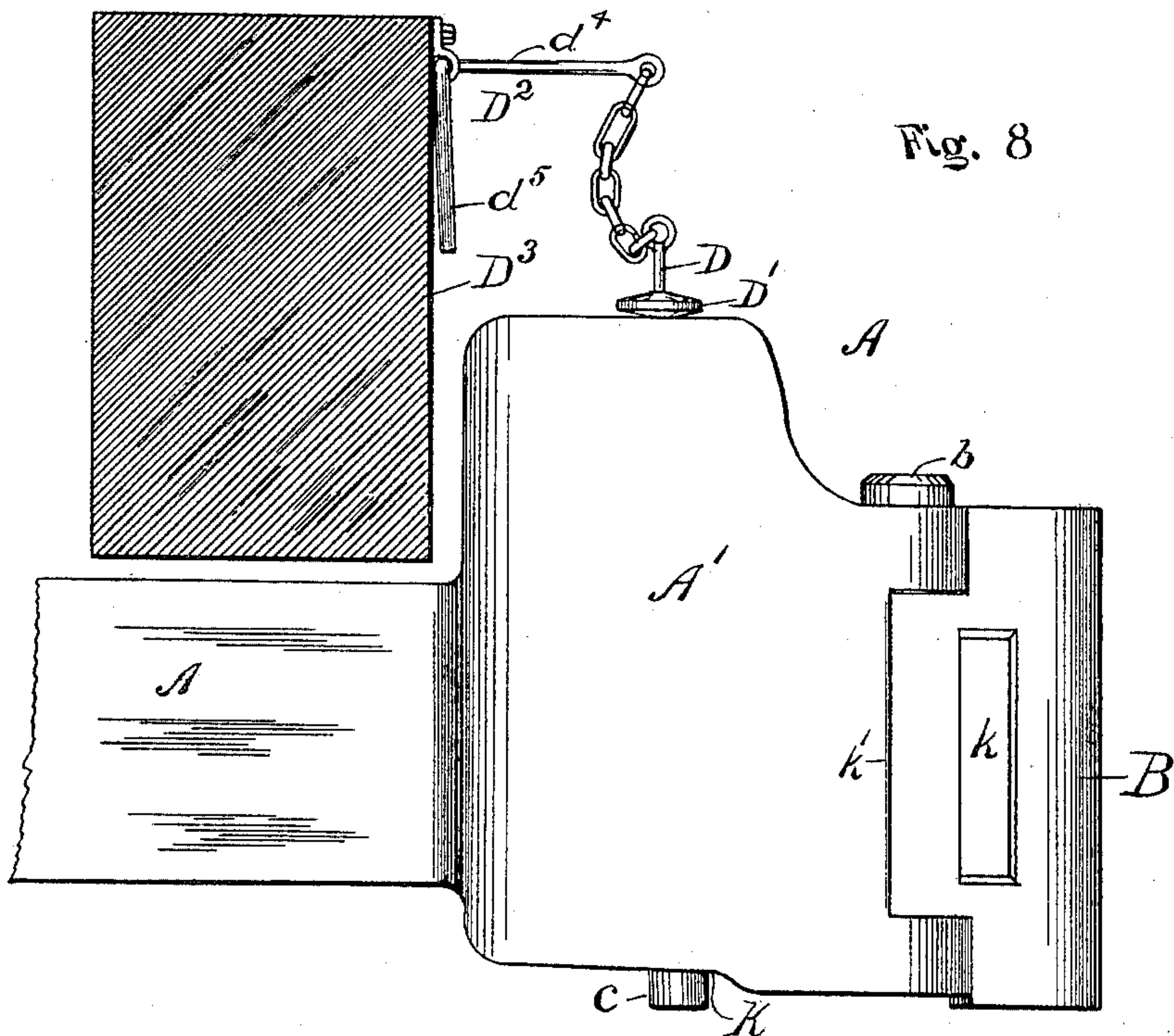


Fig. 8

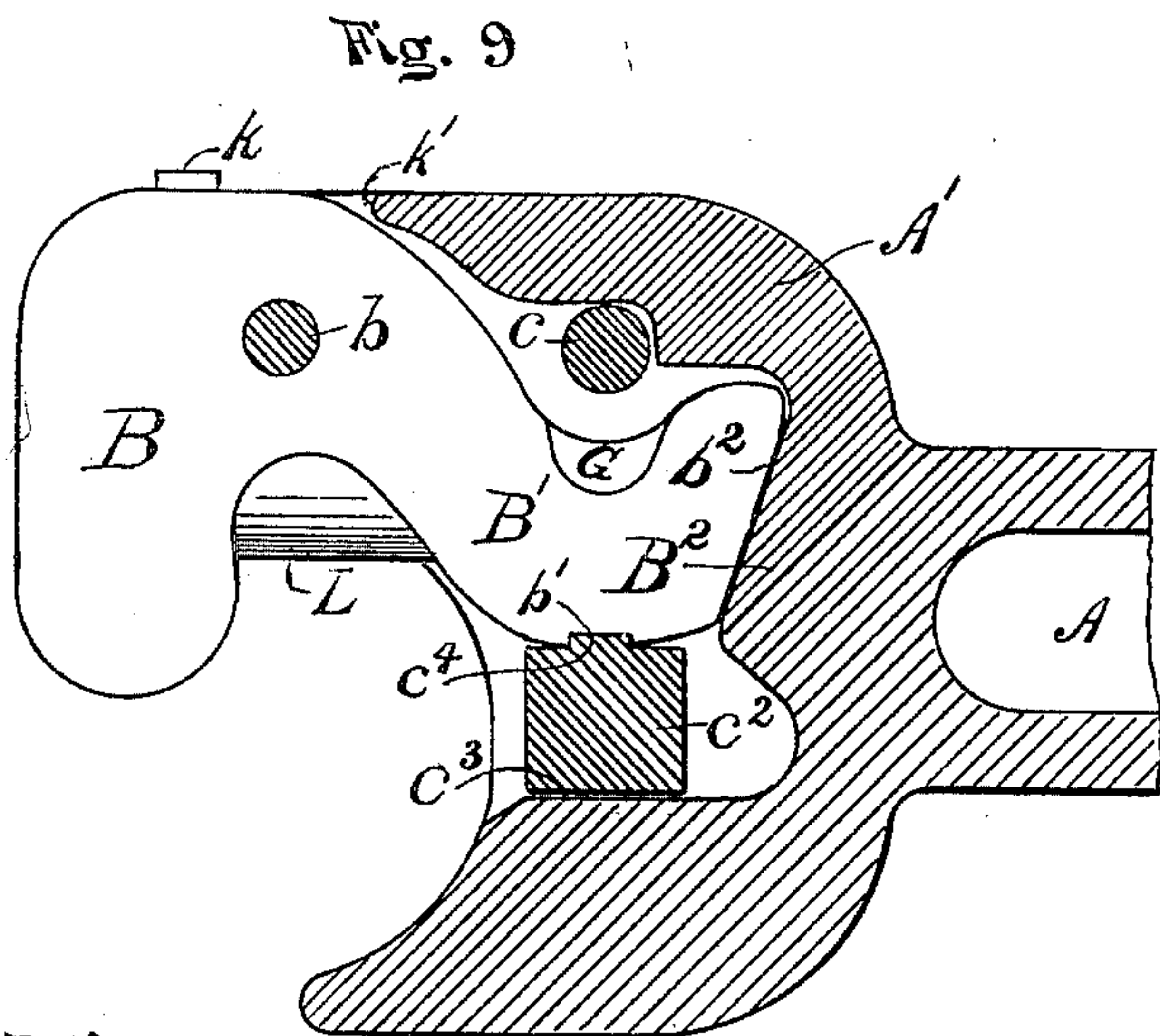


Fig. 9

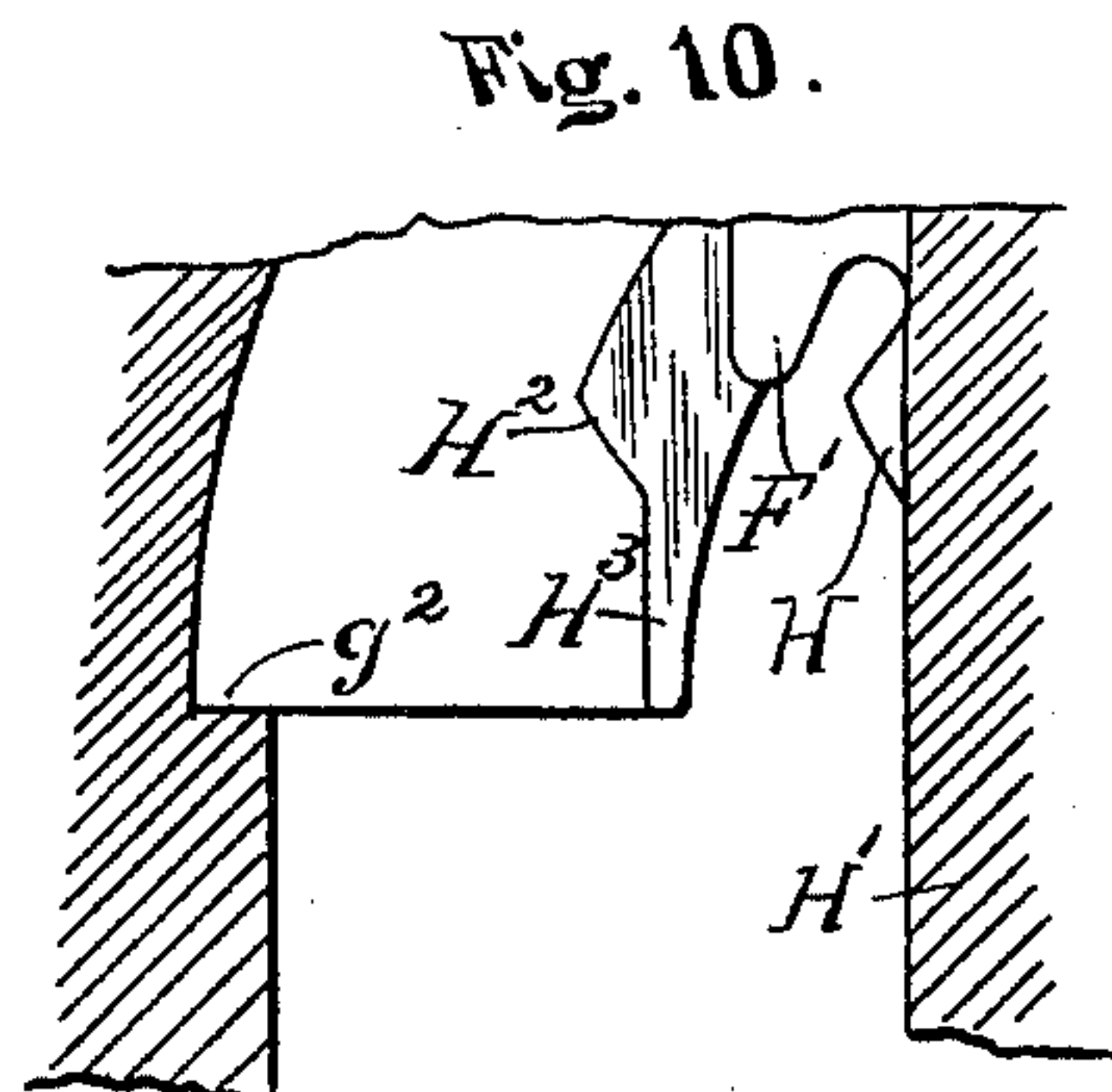


Fig. 10.

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4 Sheets—Sheet 4.

FIG. 11.

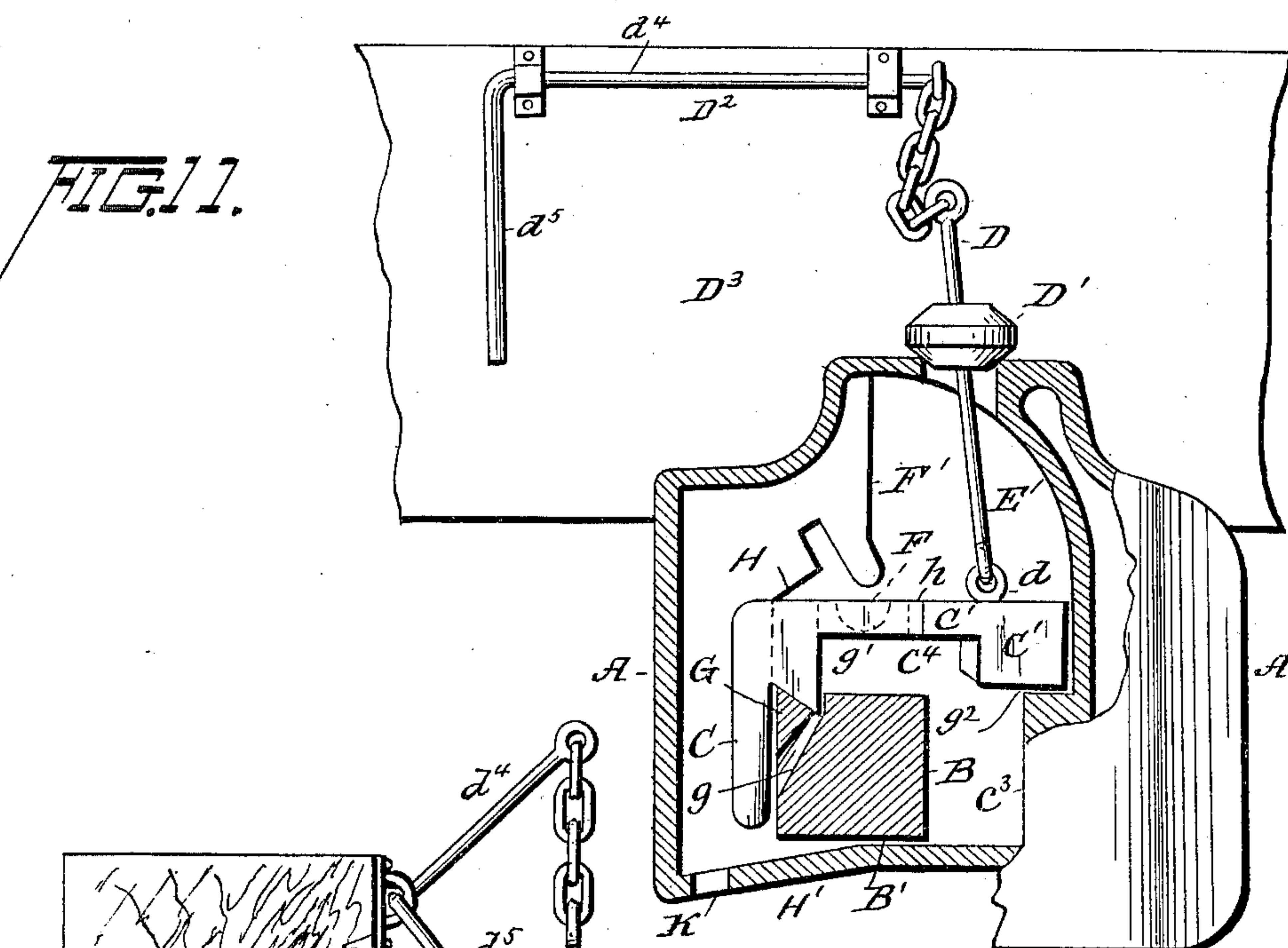
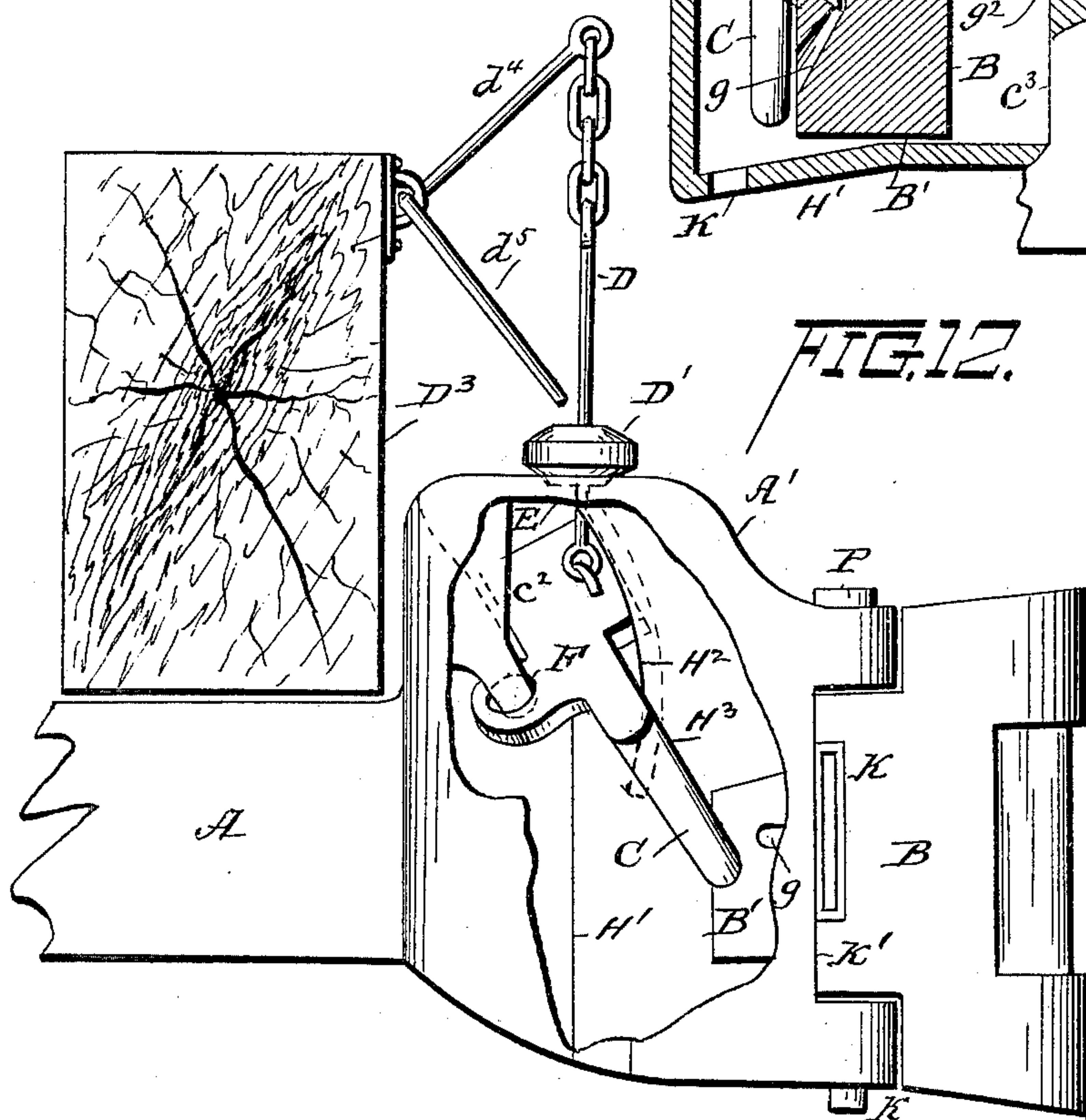


FIG. 12.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## CAR-COUPLING.

SPECIFICATION forming part of Letters Patent No. 630,132, dated August 1, 1899.

Application filed March 12, 1898. Serial No. 673,562. (No model.)

*To all whom it may concern:*

Be it known that I, WALTER B. THOMAS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Car-Couplers, of which the following is a specification.

The invention relates to that species of couplers known as the "Master Car-Builders'" type, and in essential features is practically automatic in locking, unlocking, and opening the knuckle, dispensing with springs, keys, and bolts and with the usual beveled bracket to support the lifting-rod in unlocking. By "automatic" it is intended to imply that the locking is entirely automatic, while the raising of the lifting-rod unlocks and automatically throws open the knuckle in one movement. In this construction only five movable pieces are used—to wit, the draw-head, the knuckle, the locking-lever, the pivot-pin, and the lifting-rod—and strain comes upon the first four of these alone and practically upon the first three, which are so arranged that they will hold the parts together even if the pivot-pin be broken.

The invention consists, in general terms, in combining with the knuckle and its rearwardly-projecting locking-arm a locking-lever so arranged and controlled that it falls over and locks the knuckle when the latter is closed, but tips and exerts leverage on the knuckle to open it when raised by the lifting-rod, in combining with the knuckle and its rearwardly-projecting locking-arm a locking-lever and tripping devices for said lever, whereby when the lever is raised it may be shifted upon supports above said locking-arm and held out of locking engagement therewith, in combining with the knuckle and its rearwardly-projecting locking-arm a locking-lever having a depending push-arm, a compound curved guideway, and a fixed fulcrum-stop for said locking-lever, whereby the push-arm is caused to act against the tail of the locking-arm in the direction of its path of opening movement, in forming the knuckle-locking arm with a groove inclined in a direction opposed to the direction of draft and the locking-lever with a coacting rib, whereby strain upon the knuckle tends to tighten

the lock and make it more secure, and in the various other combinations and details of construction hereinafter pointed out and claimed.

In the drawings, Figure 1 is a front elevation, partly broken away to disclose the effective parts more completely, of a coupler embodying my invention. Fig. 2 is a top plan view, partly diagrammatic, of said coupler; Fig. 3, a side elevation, also partly diagrammatic; Fig. 4, a horizontal section there-through on the line 4 4 in Fig. 3; Fig. 5, edge and side elevations of a guard-disk for the lifting-rod with a fragmentary enlarged detail thereof; Fig. 6, a fragmentary detail of the knuckle-locking arm and its inclined groove with a section through the locking-lever to show the inclined rib; Fig. 7, fragmentary details, in top plan and cross-section, of the knuckle-locking arm to explain the notch therein. Fig. 8 is a side elevation of the coupler, including the buffer-beam, to show the arrangement and connection of the lifting-lever. Fig. 9 is a horizontal section through the coupler upon the correspondingly-numbered line in Fig. 3; and Fig. 10 is an inside elevation of the front plate or wall of the chambered draw-head, showing the guide. Figs. 11 and 12 are detail views of the guideway.

A represents the draw-bar, having its projecting head A' formed to afford a chamber or casing and bearings for the knuckle and other parts of the coupler.

B is the knuckle, swinging on pivot-pin *b* and having a locking-arm B', closing into the casing. This locking-arm is notched or grooved at *b'* for the reception of a tongue from the locking-lever, as explained below. The rear end or tail of the locking-arm is beveled, as at *b<sup>2</sup>*, and the rear wall of the chambered draw-head has a beveled buffing-lug B<sup>2</sup>, matching the bevel upon the locking-arm to resist endwise thrust upon the knuckle. Obviously the fit must not be so snug as to prevent the knuckle from swinging open upon its pivot, and obviously, also, the bevels need not be plane faces, but may be described on arcs concentric with the axis of movement of the knuckle.

C is the locking-lever, located in a guide-



way C' to the rear of the knuckle, having a vertical push-arm  $c$ , arranged at the back of the locking-arm of said knuckle and a horizontal extension  $c'$  saddling the locking-arm and terminating in a depending engaging block  $c^2$ , which fills the space between the wall  $c^3$  of the guideway and the front of the locking-arm when the knuckle is closed and shuts down past said arm to lock the knuckle against opening. A rib  $c^4$  upon the inner face of the block takes into the groove  $b'$  in the locking-arm and serves to prevent the knuckle being withdrawn in case the pivot-pin breaks. The groove is advisably made somewhat inclined from the vertical, as is the rib also, so as to prevent the locking-lever from working up and out of engagement by friction. The inclination is away from the direction of strain on the knuckle, so that such strain will only tend to make the lock more secure.

A rod D serves to raise the locking-lever in its guideway to disengage the knuckle, and since the lever is to be so controlled that its push-arm will force the knuckle open by being swung against the back of the locking-arm of said knuckle this lifting-rod is to be attached at  $d$  above the depending engaging block of said lever and must have sufficient play in its guide-opening to permit the somewhat involved swinging movement of the lever, as presently to be described. Therefore to close this guide-opening and keep out dirt the lifting-rod is passed through a sufficiently close-fitting oblate disk D', which for convenience in applying may be made in halves, tongued and grooved at  $d'$ , and united at the periphery by dovetailed clips  $d^2$ , attached to one of the sections and taking into corresponding dovetailed recesses  $d^3$  in the other, as shown in the edge elevation and in the enlarged detail.

The rod D, which may be called the "lifting-rod," is raised by the lifting-lever D<sup>2</sup>, which is practically a bell-crank, shown as mounted in horizontal bearings upon the front of the buffer-beam B<sup>3</sup> and having the horizontal arm  $d^4$  flexibly connected with the head of the lifting-rod, while the pendent arm or handle  $d^5$  normally hangs parallel with the end of the car and rests against the front face of the buffer-beam or whatever part of the car it is mounted upon. Except when actuated to disengage the knuckle this lever-arm will always be in a pendent position whether the knuckle is locked or unlocked.

The engaging block of the locking-lever travels in a guideway of peculiar outline. First, it curves up and over toward the push-arm of the lever, as at E in Fig. 1, so as to swing the lever end of the push-arm against the locking-arm of the knuckle. Second, it curves up and inward, as at E' in Fig. 3, to give a resultant movement to the push-arm, causing it to follow the arc of movement of said locking-arm as it kicks it open. To bring sufficient leverage upon the push-arm in this action, a lug F is extended rearward

from the horizontal member of the locking-lever adjacent to this push-arm and counter-sunk upon its upper side to engage with a conical fulcrum-stop F' after the lever has been lifted bodily some little distance, thus positively stopping the push-arm from further ascent and causing it to forcibly describe the resultant movement above referred to. This pushing capacity of the locking-lever will be utilized whenever the knuckle is to be thrown open for the purpose of coupling with cars backing down upon its own car or toward which the latter is being shot or backed, the draft of the train opening the knuckle when a car is simply being dropped or kicked in switching or yard work; but it often happens that it is necessary or desirable to unlock the knuckle when there is no strain upon it to pull it open, as when a train is at a standstill, and leave it unlocked until the cars in front are started. For this purpose it is necessary that the locking-lever shall not come in contact with the vertical fulcrum, but shall be lifted only so far that it can be shifted upon supports above the locking-arm of the knuckle, and that means for such shifting shall be provided. Accordingly the rear upper surface of the locking-arm adjacent to the push-arm is provided with a socket G, which is carried down and out through the back of the locking-arm, with a flaring opening  $g$ , so that dirt and debris may be discharged, and the adjacent side of the push-arm is provided with a downward projection G', terminating in an inclined engaging shoulder  $g'$  at such point that when it rests in the socket the engaging block at the other end of the lever will rest upon a ledge  $g^2$  out of engagement with the locking-arm. The knuckle will then be unlocked, but not open, though readily opened whenever strain is brought upon it, while the engagement of the locking-arm with the socket will be sufficient to prevent ordinary chance displacement and relocking. To cause the endwise movement of the locking-lever necessary to bring it into this position, a trip-stop H is located upon a vertical guide-rib H' in position to engage the rearwardly-extending lug on the lever and push the lever over as it is lifted just sufficiently to cause it when released to drop into the socket and upon the ledge. This trip-stop H alone is not sufficient for effective work, since it is liable to twist the lever by one-sided action. Therefore a second trip-stop H<sup>2</sup> is located upon another guide-rib H<sup>3</sup> on the inner side of the front plate of the chambered draw-head in position to come into contact with a shoulder  $h$  upon the front of the locking-lever at the same moment that the first trip-stop strikes against the rearwardly-projecting lug, thus insuring uniformity of action.

When the knuckle is thrown open by the locking-lever and the latter released, it falls until the foot of the push-arm rests upon the base of the chambered draw-bar, while the



engaging block rests upon the above-men-  
tioned ledge  $g^3$ , the fulcrum-stop having the  
same agency as the trip-stops in shifting the  
position of the locking-lever. When the  
5 knuckle is closed, its locking-arm strikes the  
shouldered projection upon the push-arm and  
pushes aside said arm and causes it to regis-  
ter with and drop through an opening K in  
the floor of the chambered draw-bar, releas-  
10 ing the engaging block from the ledge and  
permitting the locking-lever to drop and se-  
cure the knuckle. In case the lifting-rod  
breaks, or in any emergency, the coupling  
can be opened by lifting the protruding end  
15 of the push-arm.

The locking-lever can never drop behind  
the knuckle-locking arm, even should it fail  
to be shifted far enough to engage with the  
ledge  $g^2$  or should it be shaken off of such  
20 ledge by the jarring of the car, for the reason  
that the tail of the locking-arm never passes  
entirely from beneath the locking-lever.  
Consequently should said lever fall from the  
ledge the engaging block will rest upon the  
25 locking-arm in rear of the inclined groove  
therein and in position to fall into and en-  
gage with said groove whenever the knuckle  
is closed. This limitation of movement of  
the locking-arm is due to a stop  $k$  upon the  
30 knuckle, which comes against the side of the  
draw-head at  $k'$ , while the tail of the locking-  
arm is still beneath the engaging block or  
that end of the locking-lever carrying the  
engaging block and prevents its further with-  
35 drawal.

Between the knuckle and the locking-arm  
extends a rib L, midway between the lugs of  
said knuckle, which rib is intended to fit be-  
tween the lugs of an opposing coupler to pre-  
40 vent uncoupling by up-and-down movement  
and to help carry the weight of the car in case  
the truck breaks down or jumps the track.  
In case the rear draft attachments give way  
under strain and the knuckle fails to unlock,  
45 and the coupler is therefore pulled out en-  
tirely, it will be supported and prevented  
from falling upon the track by this rib be-  
tween the lugs and the locking-arm resting  
between the lugs of the knuckle on the oppos-  
50 ing coupler and the corresponding rib upon  
the latter knuckle resting between the lugs  
of the knuckle on the coupler pulled out; but  
ordinarily whenever the draft attachments  
give way the strain of the lifting-lever on the  
55 lifting-rod and through that upon the lock-  
ing-lever will release the knuckle and it will  
open, uncoupling from the adjacent car be-  
fore the coupler is pulled out or so far torn  
from its fastenings as to be in danger of fall-  
60 ing upon the track.

The push-arm may be operated, but not as  
effectively, by employing the curved guide  
(shown in Fig. 1) and omitting the secondary  
curve, (shown in Fig. 3,) the other parts re-  
65 maining the same.

I claim—

1. The combination with the knuckle and

its locking-arm having rearwardly-inclined  
groove, of the engaging block having rear-  
wardly-inclined rib, the inclination of said 70  
groove and rib being opposed to the direction  
of draft.

2. The combination with the knuckle and  
its locking-arm having a rearwardly-inclined  
groove, of the locking-lever having an engag- 75  
ing block with a rearwardly-inclined rib ar-  
ranged to drop between said locking-arm and  
the proximate wall of the chambered draw-  
head when the knuckle is closed, to lock it  
against opening. 80

3. The combination with the knuckle and  
its locking-arm having a rearwardly-inclined  
groove, of the locking-lever carrying an en-  
gaging block at one end to bar the movement  
of said locking-arm, said block having a rear- 85  
wardly-inclined rib, and having a depending  
push-arm at the other end, the ledge in the  
chambered draw-head, for the support of the  
block, a trip-stop to shift the locking-lever  
endwise, and means for lifting said locking- 90  
lever.

4. The combination with the knuckle and  
its locking-arm having a socket in its rear up-  
per face, of the locking-lever carrying an en-  
gaging block to bar the movement of said 95  
locking-arm and having a depending arm  
with a shoulder to engage said socket, the  
ledge for the support of said block, a trip-stop  
to shift the locking-lever, and the lifting-rod.

5. The combination with the knuckle and 100  
its locking-arm having a groove in its front  
face and a socket at its rear, of the locking-  
lever carrying an engaging block having a  
rib to enter said groove, and a depending  
arm with a shoulder to engage said socket, 105  
the ledge for the support of the engaging  
block, a trip-stop to shift the locking-lever  
and the lifting-rod.

6. The combination with the knuckle and  
its locking-arm, of the locking-lever carrying 110  
an engaging block at one end to bar the open-  
ing of the knuckle, and a downwardly-pro-  
jecting push-arm at the other end, and said  
locking-lever having a projection at its rear  
and a shoulder at its front, the ledge in the 115  
chambered draw-head, and the two ribs and  
trip-stops arranged to coact with said projec-  
tion and shoulder to shift the locking-lever  
upon the ledge.

7. The combination with the knuckle and 120  
its locking-arm having a socket in its rear  
upper face, of the locking-lever carrying an  
engaging block to bar the opening of the  
knuckle and having a depending arm with a  
shoulder to engage said socket, a rearward 125  
projection and a trip-shoulder at its front, the  
ledge in the chambered draw-head, and the  
two ribs and trip-stops arranged to coact with  
the rearward projection and trip-shoulder, to  
shift the locking-lever upon the ledge and into 130  
engagement with the socket.

8. The combination with the knuckle and  
its locking-arm, of the locking-lever having  
an engaging block at one end and a push-arm



at the other end, means for lifting said lever, and a compound guideway for said lever as it is lifted, whereby the push-arm is thrust against the locking-arm to open the knuckle.

5 9. The combination with the knuckle and its locking-arm, of the locking-lever having an engaging block at one end and a depending push-arm at the other end, means for lifting said lever, means for guiding the block  
10 end of the lever as it is lifted, in a compound curve and a fulcrum-stop for the push end of the lever, whereby the push-arm is caused to move in a path corresponding with the path traveled by the locking-arm as the knuckle  
15 is opened.

10 10. The combination with the knuckle and its locking-arm, of the locking-lever having an engaging block at one end and a depending push-arm at the other end, means for lifting the lever, means for guiding the block  
20 end of the lever as it is lifted to guide the push-arm against the locking-arm, to open the knuckle, a ledge for the support of the block end, and a fulcrum-stop for the push  
25 end, arranged to swing the push-arm against

the locking-arm, and to shift the lever over to position for engagement with the ledge.

11. The combination with the knuckle and its locking-arm of the locking-lever having an engaging block at one end and a push-arm  
30 at the other end, the doubly-curved guideway for the engaging block, the fulcrum-stop, and the lifting-rod.

12. The combination with the knuckle and its locking-arm, of the locking-lever having  
35 an engaging block at one end, a push-arm on the other, and a rearwardly-extending countersunk lug adjacent to said push-arm, the doubly-curved guide for said block, the lifting-rod, and the conical fulcrum-stop.  
40

13. The oblate disk or washer having a central opening, and made in two pieces united by tongue and groove and peripheral dovetailed clips and recesses.

In testimony whereof I affix my signature  
45 in presence of two witnesses.

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Witnesses:

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