

(No Model.)

P. BURNS.  
DRIVE CHAIN.

No. 575,696.

Patented Jan. 26, 1897.

FIG-1-

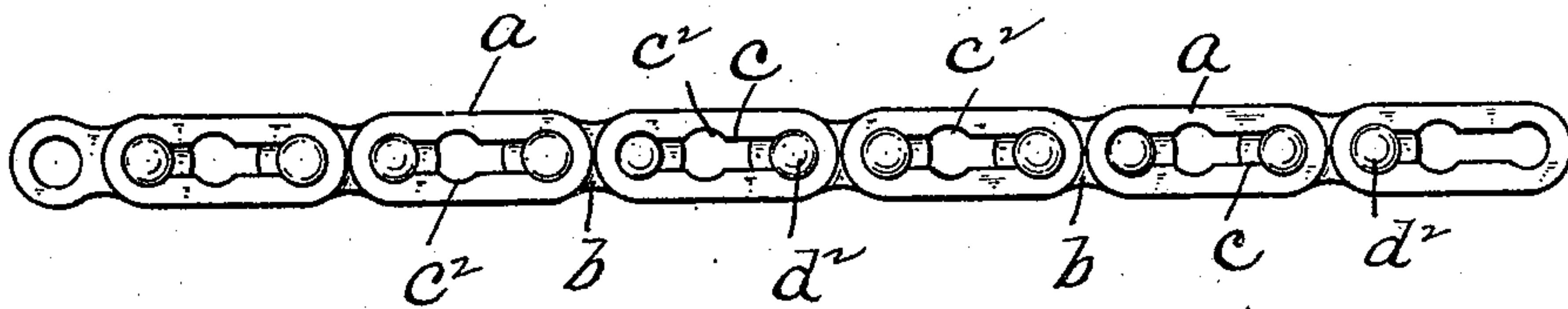


FIG-2-

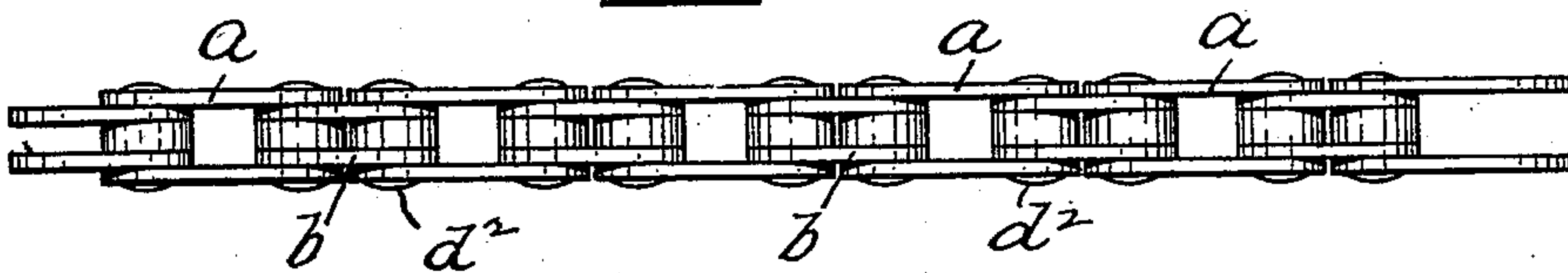


FIG-3-

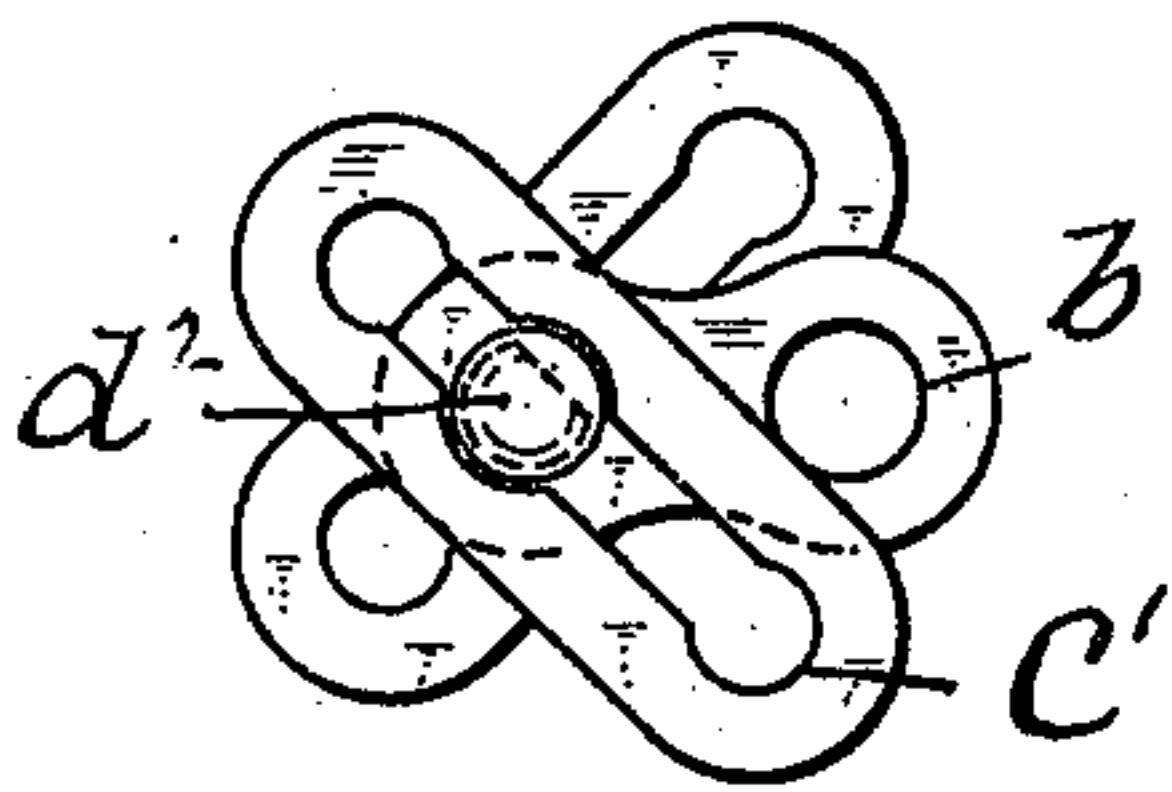


FIG-4-

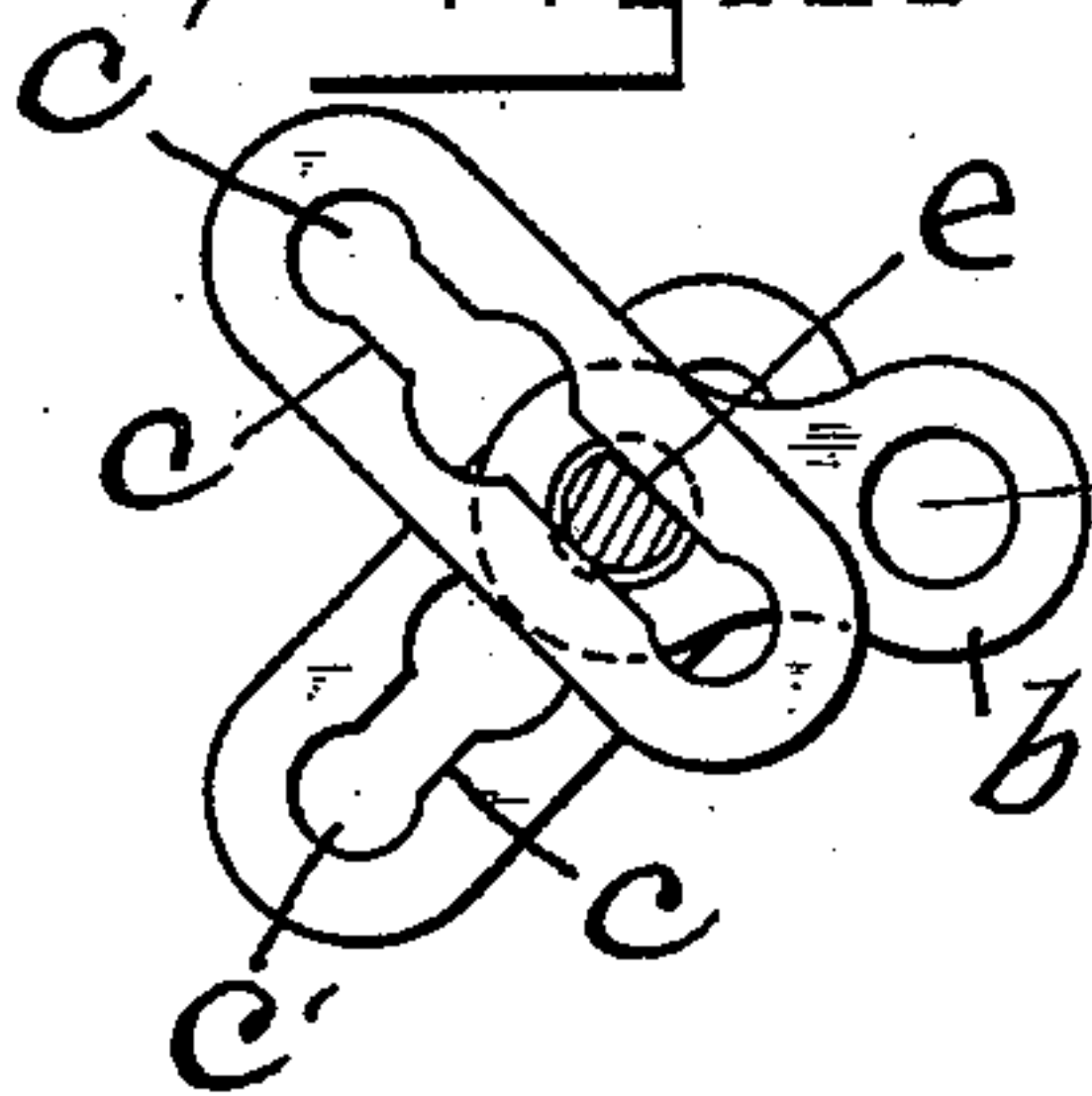


FIG-5-

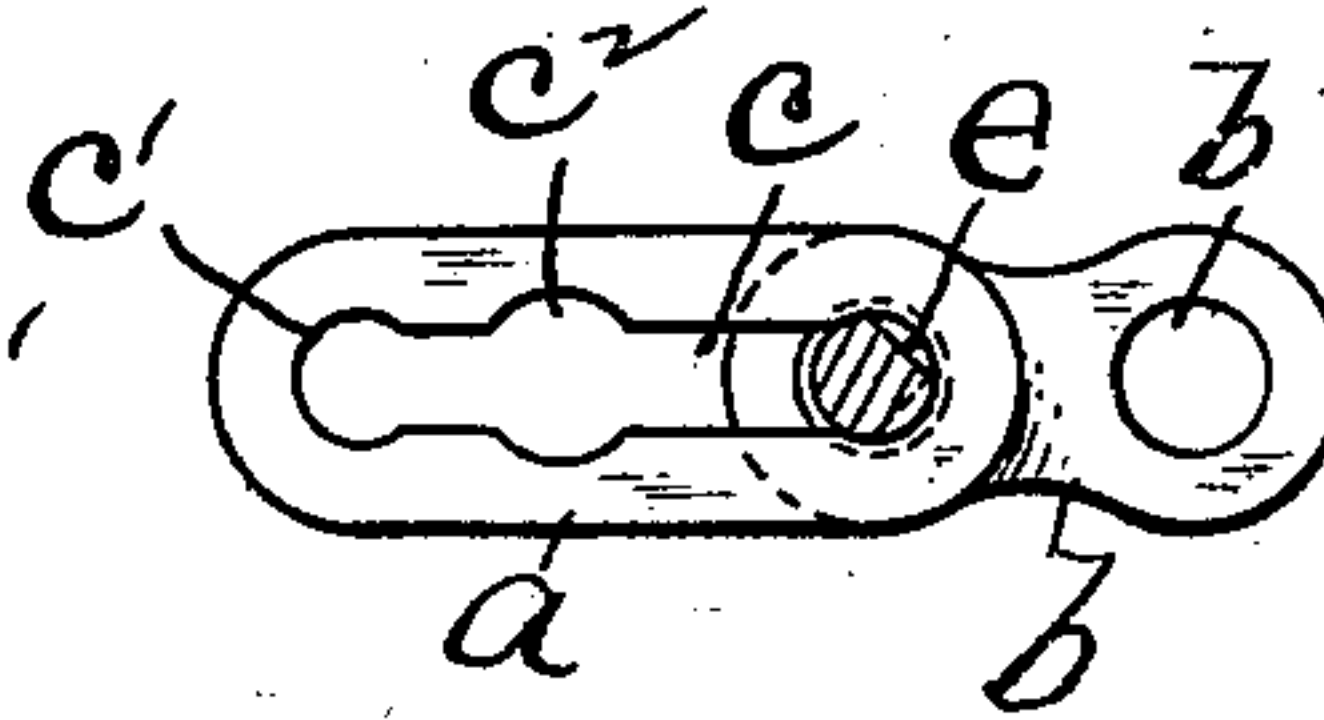


FIG-6-

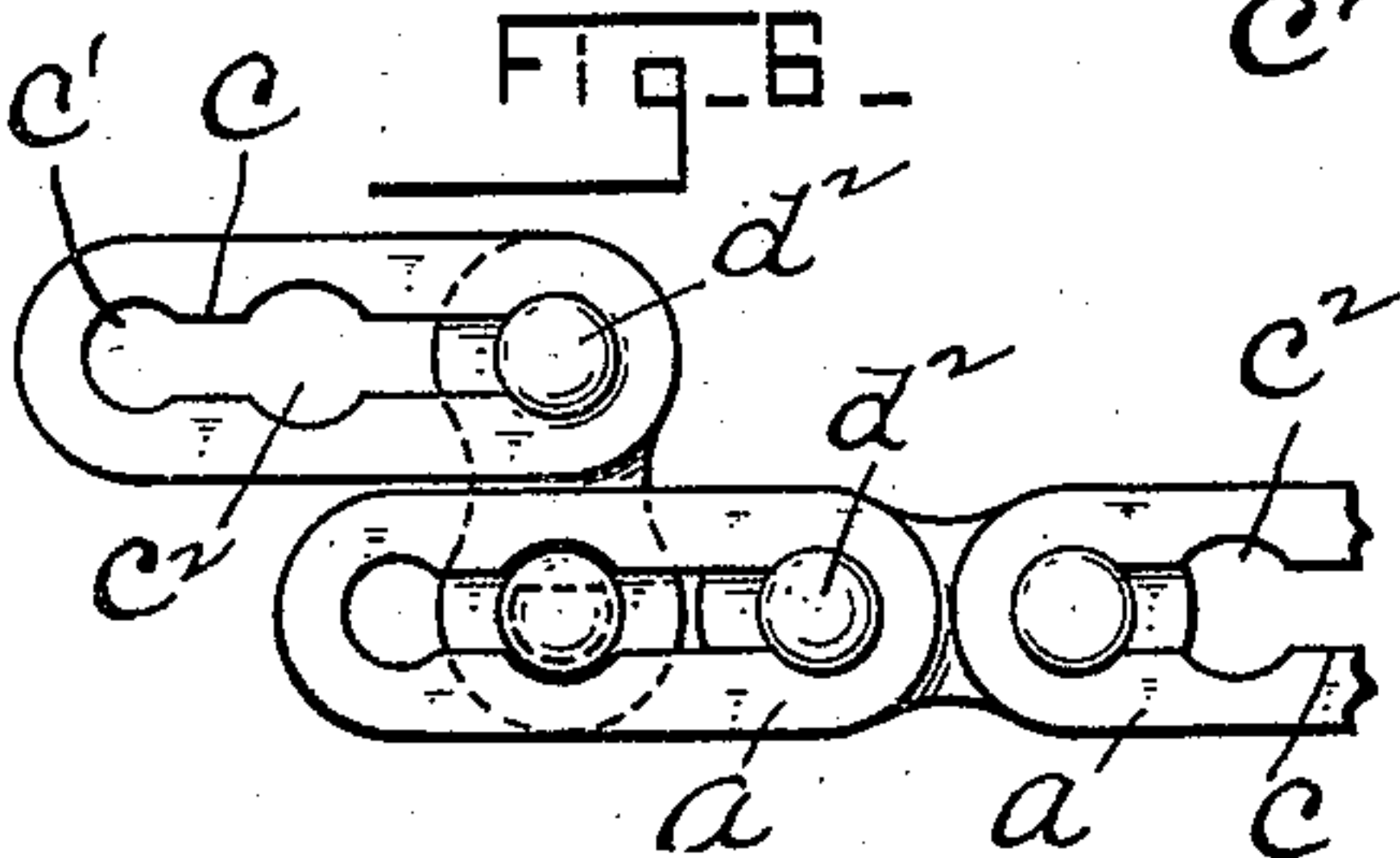


FIG-7-

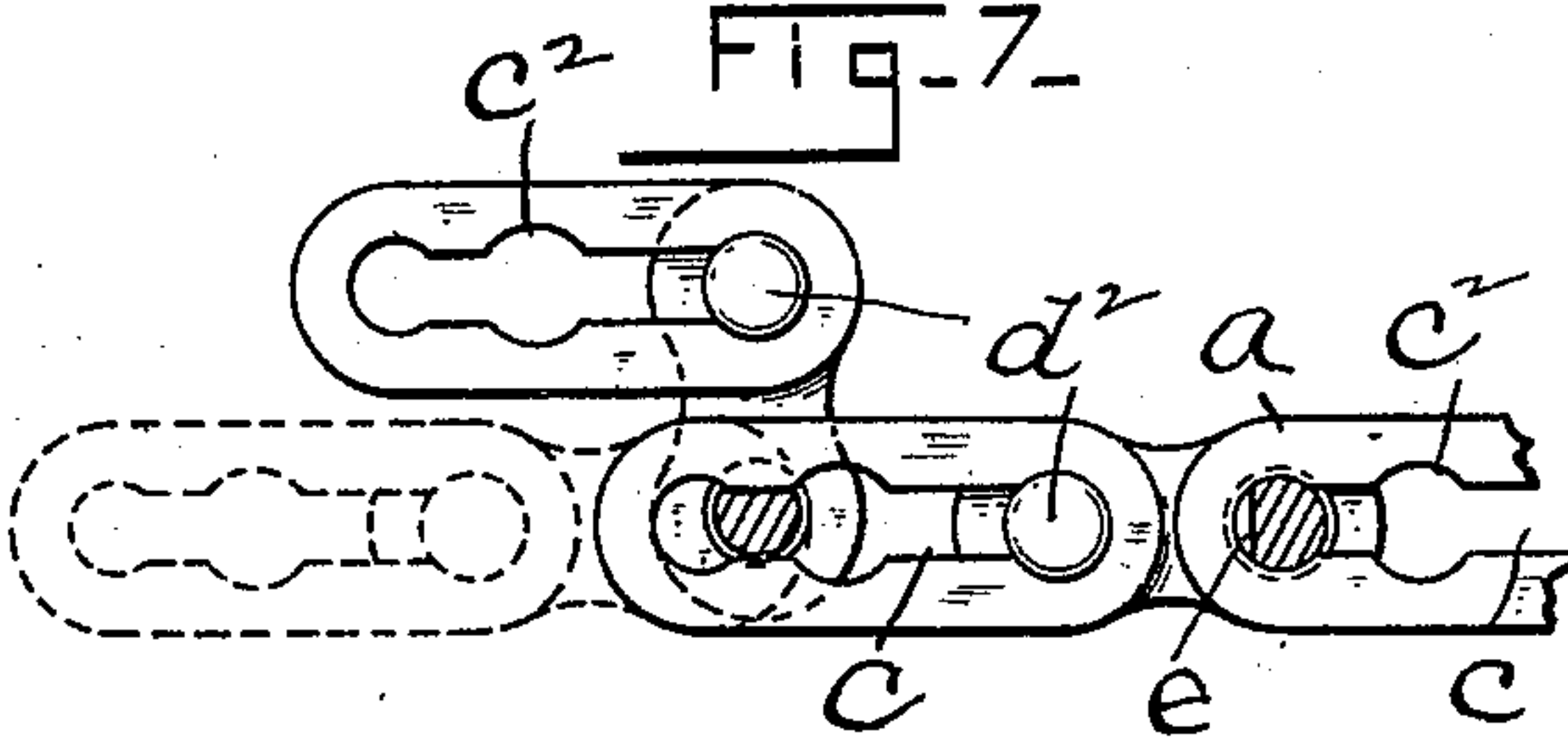


FIG-8-

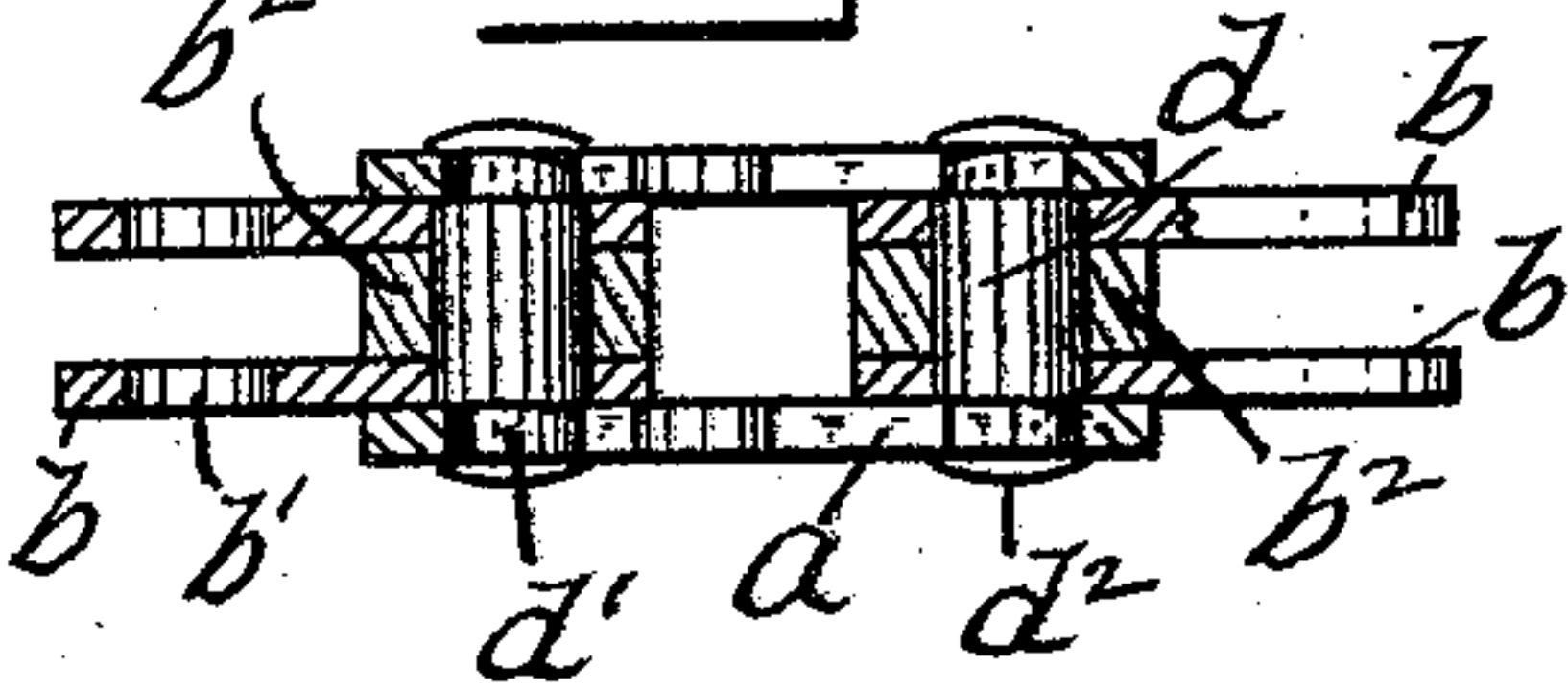


FIG-9-

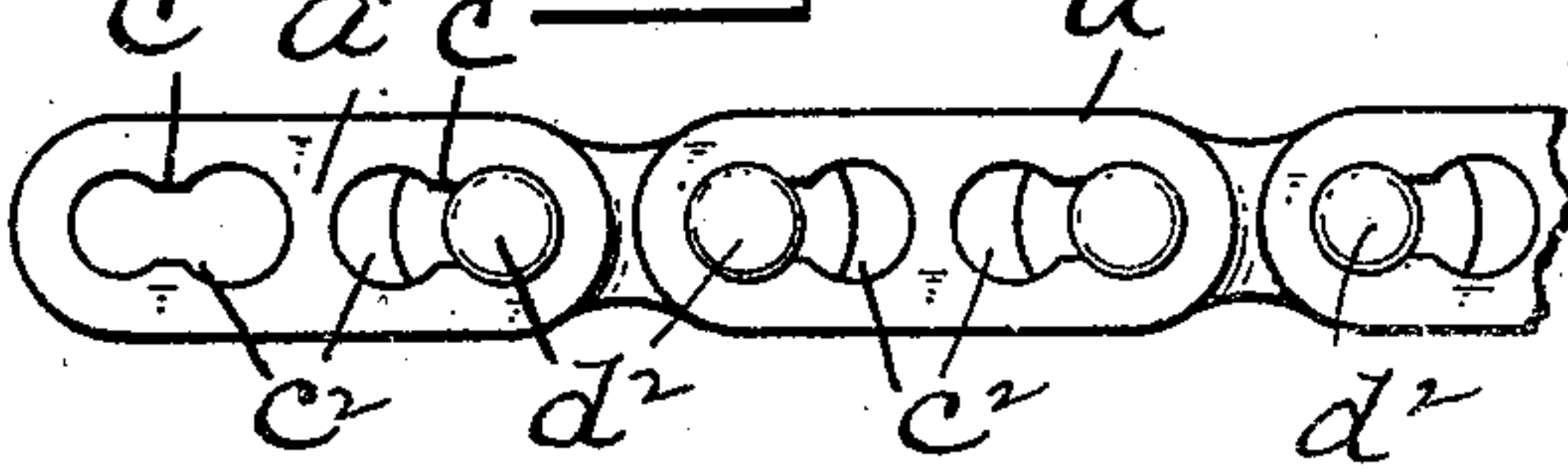
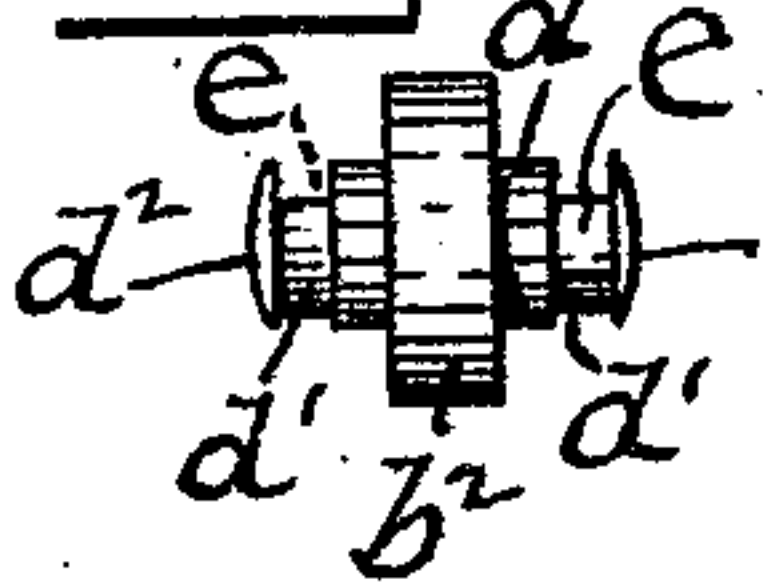


FIG-10-



Witnesses

*Oliver M. Luther.*  
*May F. Ritchie.*

Inventor,

*Philip Burns,*

By Attorney

*Frank H. Allen*



# UNITED STATES PATENT OFFICE.

PHILIP BURNS, OF NORWICH, CONNECTICUT.

## DRIVE-CHAIN.

SPECIFICATION forming part of Letters Patent No. 575,696, dated January 26, 1897.

Application filed May 25, 1896. Serial No. 593,051. (No model.)

*To all whom it may concern:*

Be it known that I, PHILIP BURNS, a citizen of the United States, residing at Norwich, New London county, State of Connecticut, have invented certain new and useful Improvements in Drive-Chains, which improvements are fully set forth and described in the following specification, reference being had to the accompanying sheet of drawings.

This invention is in the well-known class of drive-chains used in connection with bicycles and is especially applicable to such use; and my object is to simplify the construction of such chains to the end that they may be more cheaply produced than heretofore and to provide a chain the various elements of which may be readily assembled without the aid of machinery, and which may also be readily disassembled at any point throughout its length.

To assist in the explanation of my invention, I have provided the accompanying sheet of drawings, illustrating the same, as follows:

Figure 1 is a side elevation of a short section of my improved chain. Fig. 2 is a plan view thereof; and Figs. 3, 4, 5, 6, and 7 illustrate, on a somewhat enlarged scale, successive steps in the process of assembling the same. Fig. 8 is a central longitudinal sectional view of a portion of my chain. Fig. 9 shows in elevation, enlarged, a modification of said chain; and Fig. 10 shows detached and also on an enlarged scale a modification of a certain element thereof.

Chains of the class to which my invention relates consist, usually, of alternate side and block links, the former of which are arranged in pairs and receive between the ends of the members of each pair the ends of the intermediate or block links. The ends of said side and block links overlap each other and are riveted and hinged together in the manner well understood. In place of the described block links links similar to the side links are sometimes used, the center links being arranged in pairs, and in order that the chain may be of desired width a collar or washer is introduced between the links of each pair near the ends thereof, said links and collars being then riveted and hinged to the side links. In both of the described forms of chains headed rivets are used to

hinge the links together, and one object of my present invention is to dispense with the slow riveting operation as well as to provide a chain that is separable at any point in its length.

Referring to the drawings, the letter *a* denotes the side links, and *b* the intermediate links, of my chain. Each link *a* of my preferred form has cut therein a slot *c*, extending parallel to its length, the opposite ends of which slots are formed with circular enlargements *c'*. The intermediate links *b* are provided with the usual holes *b'*, which latter, together with the circular enlargements *c'* of the links *a*, receive and provide seats for the headed pins by means of which said side and intermediate links are hinged together. The intermediate link here illustrated consists of two thin link-sections separated by rolls *b''*, that are mounted on the hinge-pins hereinafter referred to, but solid center links would work equally well.

Slot *c* is provided at a point near the middle of its length with a circular enlargement *c''* of a diameter somewhat greater than that of the circular enlargement *c'* already described and also larger than that of the headed pins which serve to hinge together the chain-links.

The pins are denoted by reference-letter *d* and are shouldered down or annularly grooved near each end, as at *d'*, such grooved portions being in length slightly greater than the thickness of the side links and in diameter slightly less than the circular enlargement *c'*. Pins *d* are thus provided with heads *d''* of approximately the same diameter as the body of the pin.

Each of the portions *d'* of pins *d* is provided with a flattened portion *e* in its perimeter, the extent of such flattening being sufficient to allow the portions *d'* to enter and slide in the slots *c*, this construction being necessary in the process of assembling and disassembling my chain.

In assembling my chain a pin *d* is first placed in one of the holes *b'* of an intermediate link *b*, and a side link *a* is then placed on each side of said intermediate link, the ends of pin *d* passing through the enlargement *c''* of the slot *c*, Fig. 3. Links *a* are then drawn forward on the "shouldered" portions *d'* of the pin, such action being made possible by first turn-



ing pin  $d$  in its seat so as to allow the portion  $d'$  to travel in slot  $c$ , the flattened portion  $e$  of said pin meanwhile engaging one of the walls of slot  $c$ , as is clearly shown in Fig. 4.

5 It should be noted that the flattened points  $e$  on the opposite ends of the pin  $d$  are in different planes, and hence the links  $a$  must be introduced at an angle to each other, as shown in Figs. 3 and 4. Links  $a$  are then drawn  
10 forward on pin  $d$  until the pin ends enter the enlargement  $c'$  at the end of slot  $c$ , when the links  $a$  may then be turned on the pin and brought into the position of Fig. 5, in alignment with each other, and when in this position  
15 it will be readily understood that any return movement of pin  $d$  in slot  $c$  will be impossible for the reason that the flattened portions of the pin are in different planes, and hence the pin cannot be rotated sufficiently  
20 to allow rivet  $d$  to travel backward in the slot  $c$ . So long as the chain links are kept in alignment, or substantially so, the pins cannot become displaced. When, however, it is desired to disconnect the links, it is only necessary  
25 to slacken the chain and swing the links into the positions shown in Figs. 3 and 4, when they may be freely slipped apart.

In Figs. 6 and 7 I have illustrated the positions assumed by the links last added to a  
30 chain relatively to those links that have been connected and straightened into alignment with each other.

It should be noted that the enlargement  $c^2$  of slot  $c$  is located at one side of the center of  
35 said slot. This is so arranged in order that the center link  $b$  when being entered may clear the center link last placed in that chain. If the enlargements were centrally located, it would be impossible to assemble the center

links unless the latter were made so thin at 40 their rounded ends as to seriously weaken them.

In Fig. 8 I have illustrated a modification of my invention in which each side link  $a$  is provided with two slots  $c$  and two enlargements 45  $c^2$ , a partition  $a'$  being left between the said enlargements, thus strengthening the links. This construction is, however, only desirable in chains requiring extraordinary strength.

In Fig. 10 I have shown the pin  $d$  and the 50 roll  $b^2$  as made integral instead of separate, as in the other figures, either form being quite practicable.

Having thus described my invention, I claim—

1. In a bicycle-chain, in combination, side links having slots with enlargements  $c'$  at each end, as set forth, center links, and pins for hinging together said side and center links; said pins being formed at each end with annular channels and with flattened portions  $e$  60  $e$  that are located in different planes, substantially as and for the purpose specified.

2. In a bicycle-chain, in combination, side links having slots with enlargements  $c'$  at each 65 end and with an enlargement  $c^2$  located at one side of the center of said links, as set forth, center links, and pins for hinging together said side and center links; said pins being formed at each end with annular channels and 70 with flattened portions  $e e$  that are located in different planes, all being substantially as and for the purpose specified.

PHILIP BURNS.

Witnesses:

FRANK H. ALLEN,  
MAY F. RITCHIE.