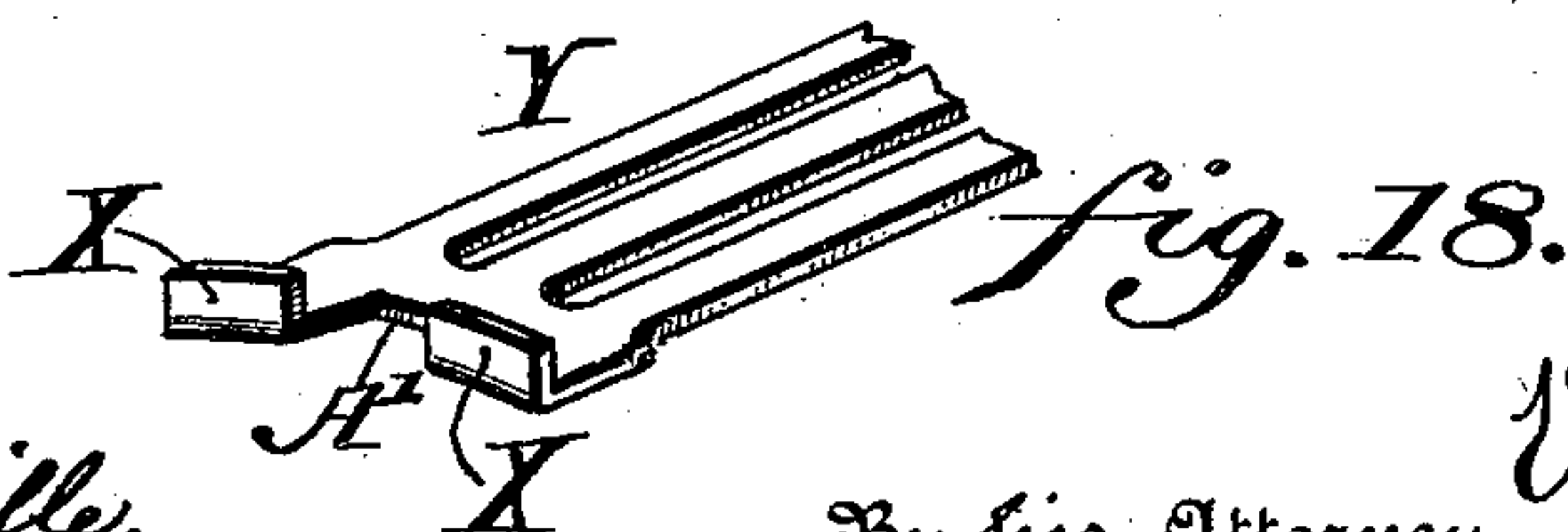
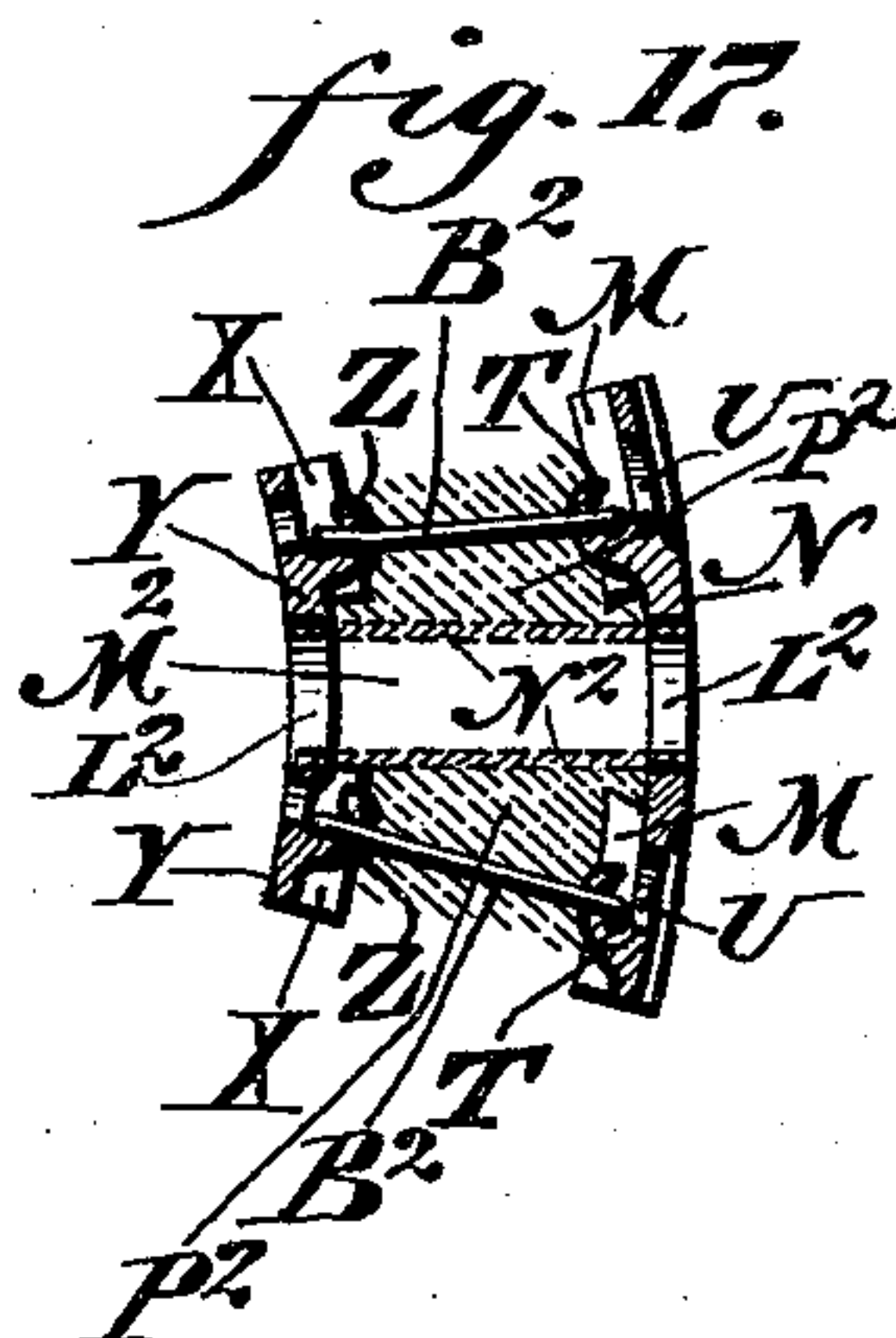
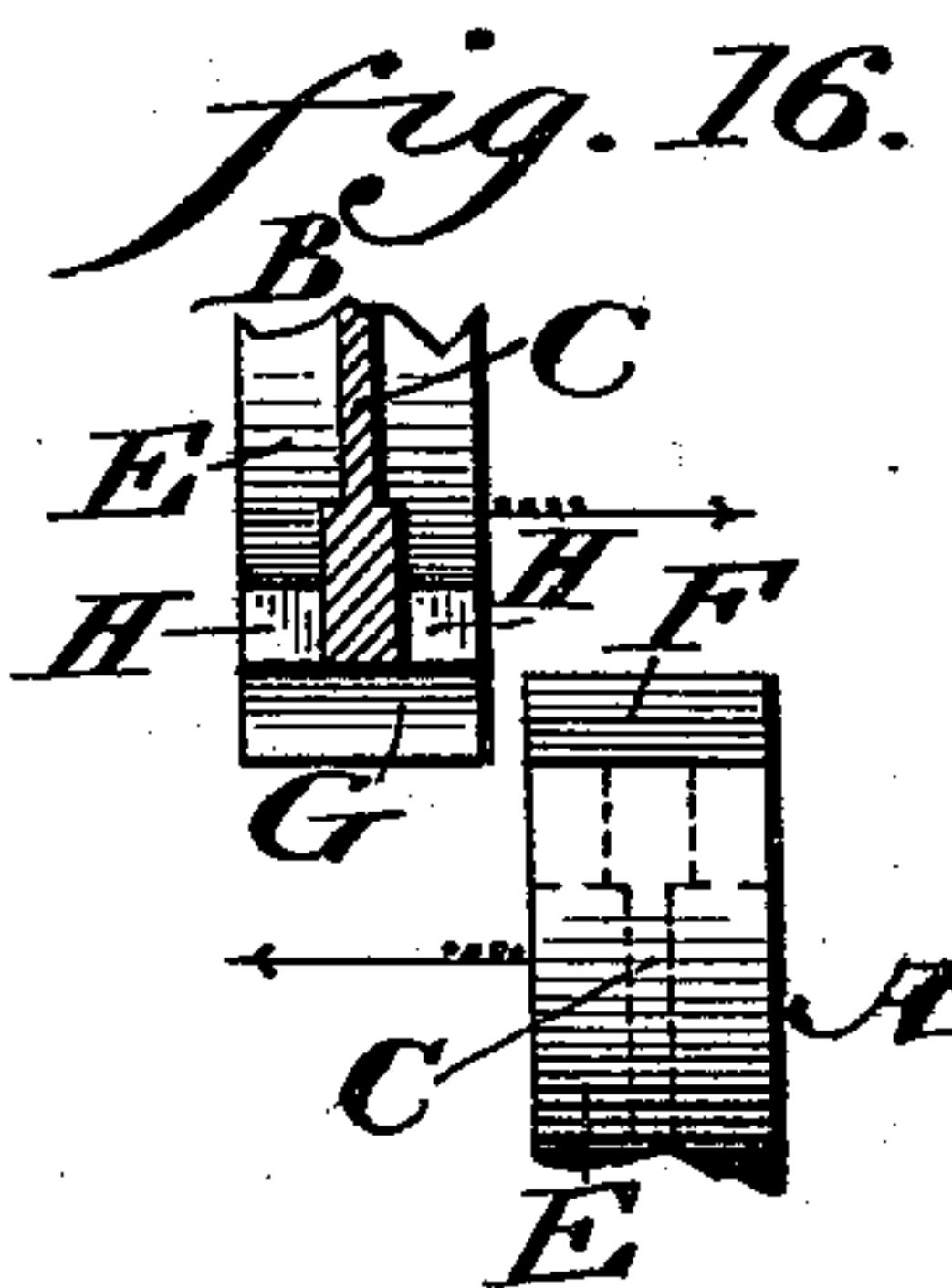
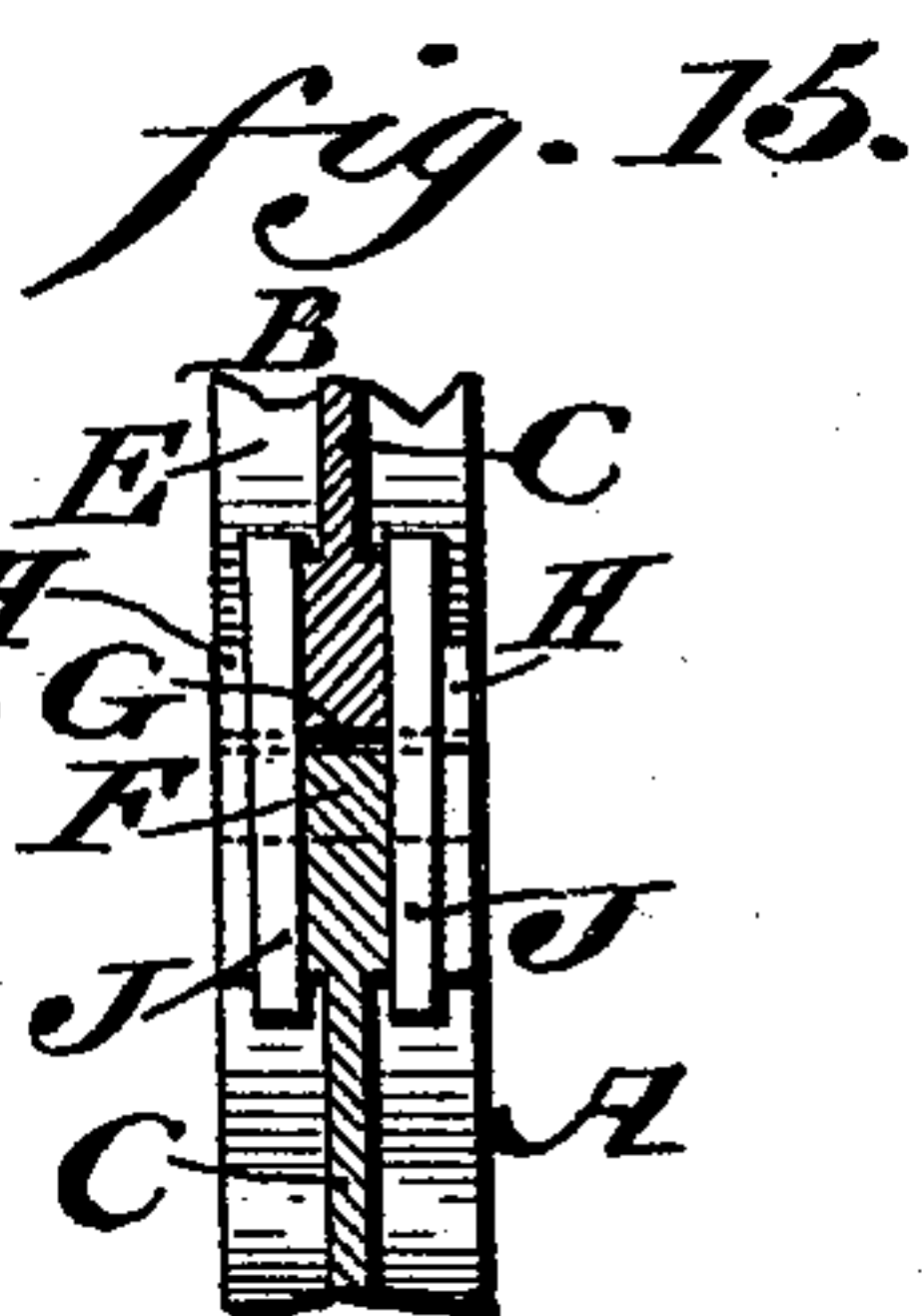
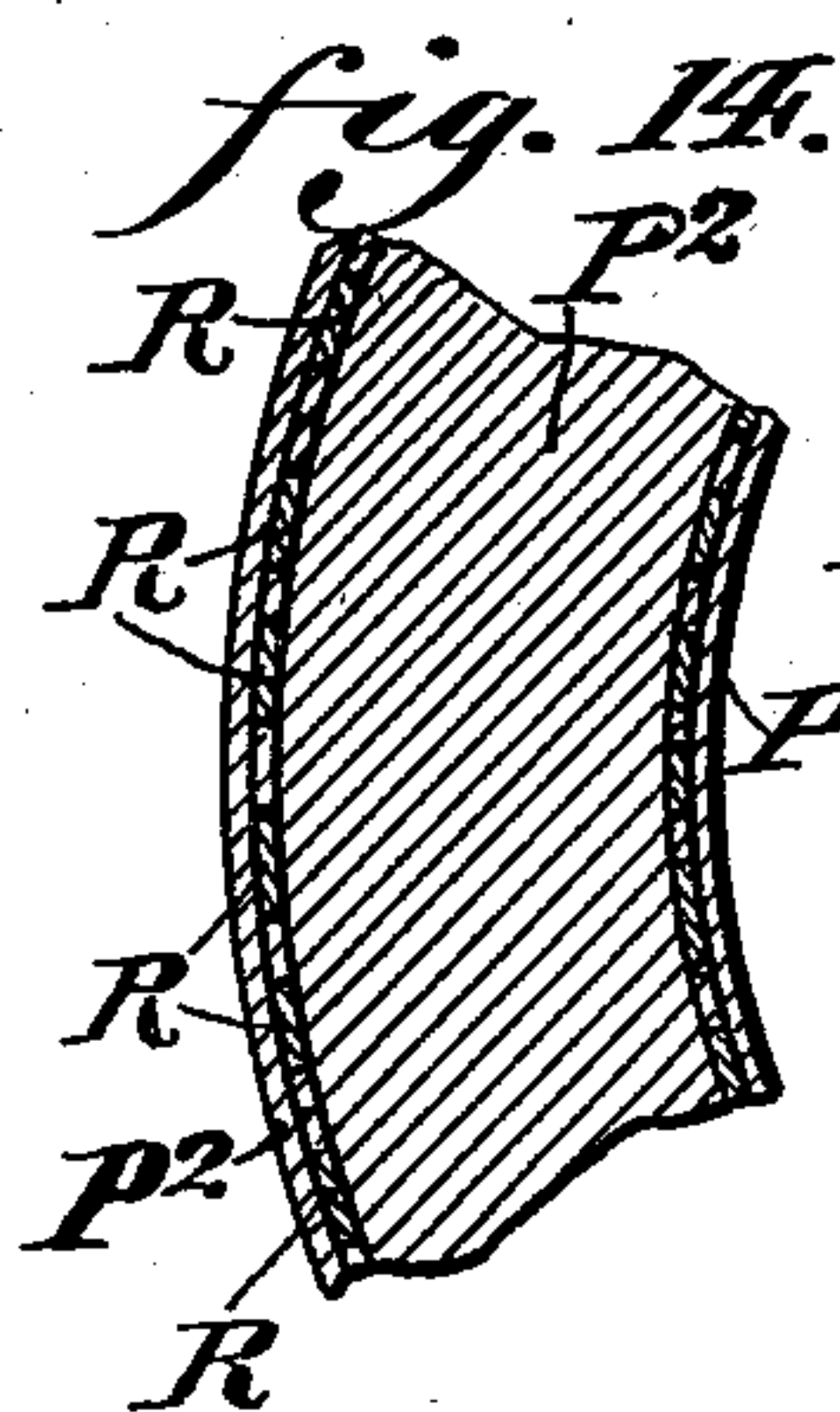
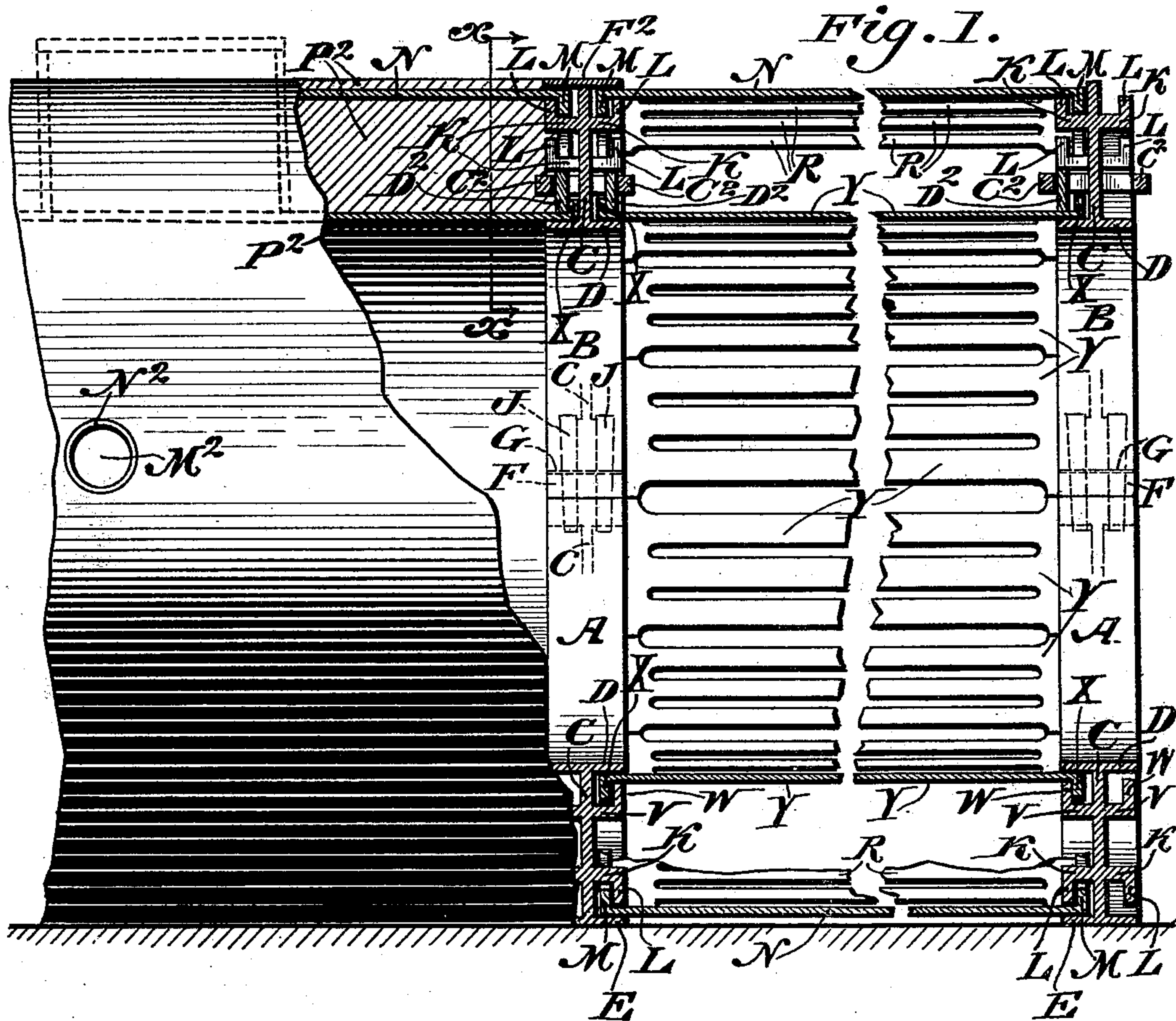


2 Sheets—Sheet 1.

Patented July 16, 1895.



Witnesses  
L. Dowville,  
P. H. Taggart.

By his Attorney

Inventor  
William Walter  
John Diederheim.



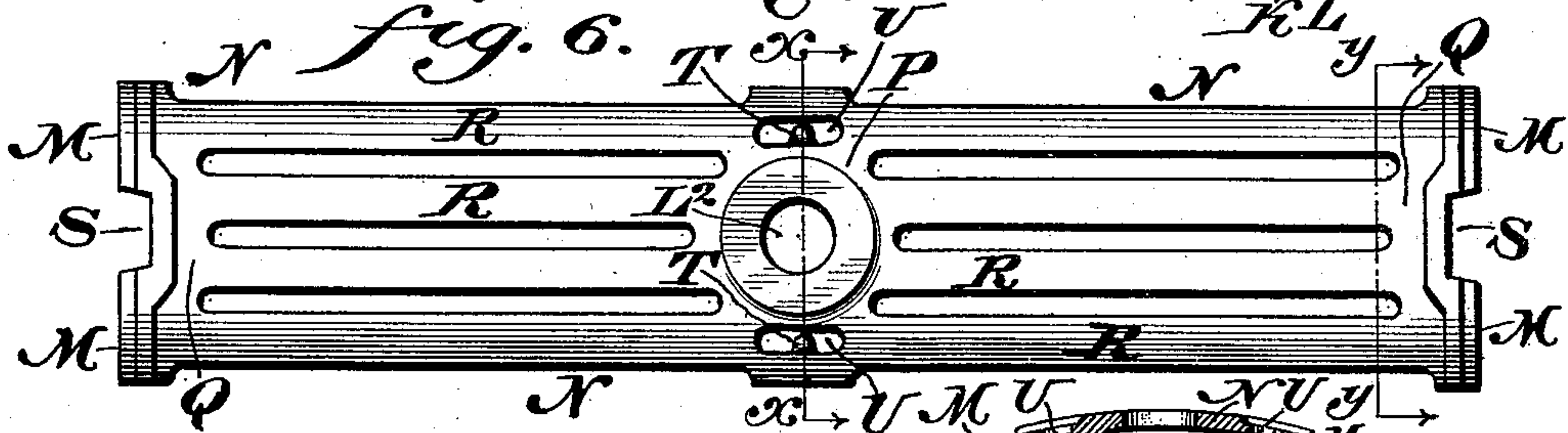
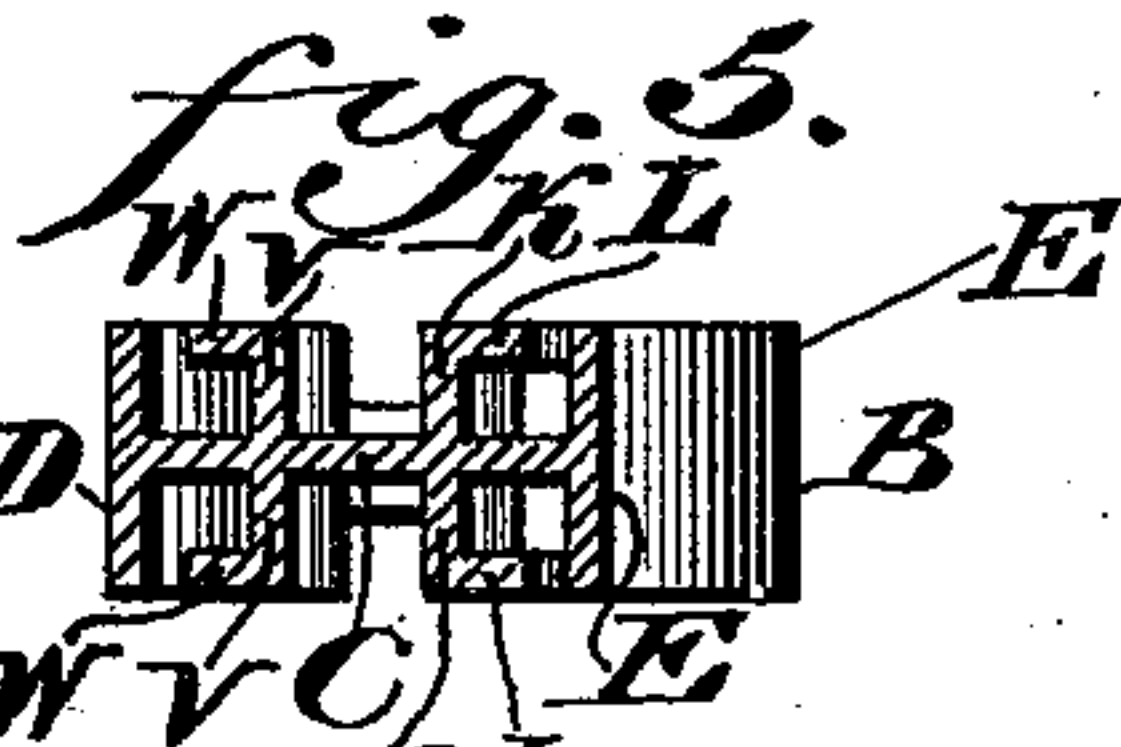
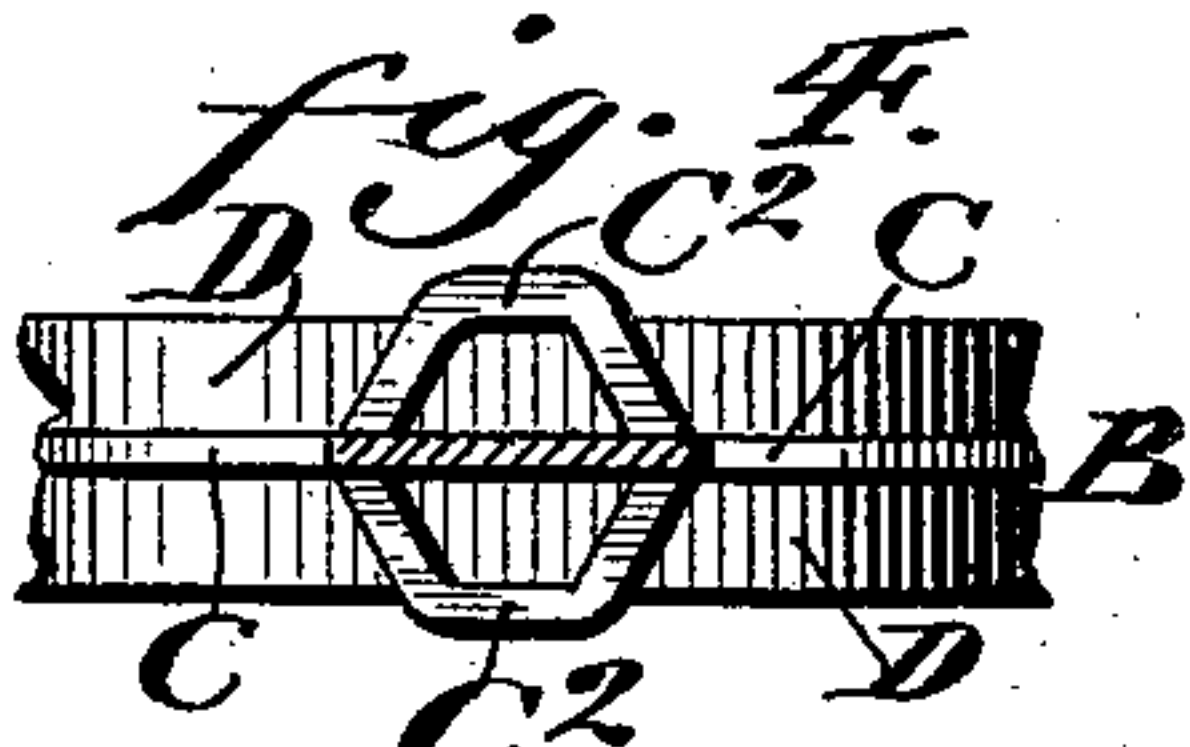
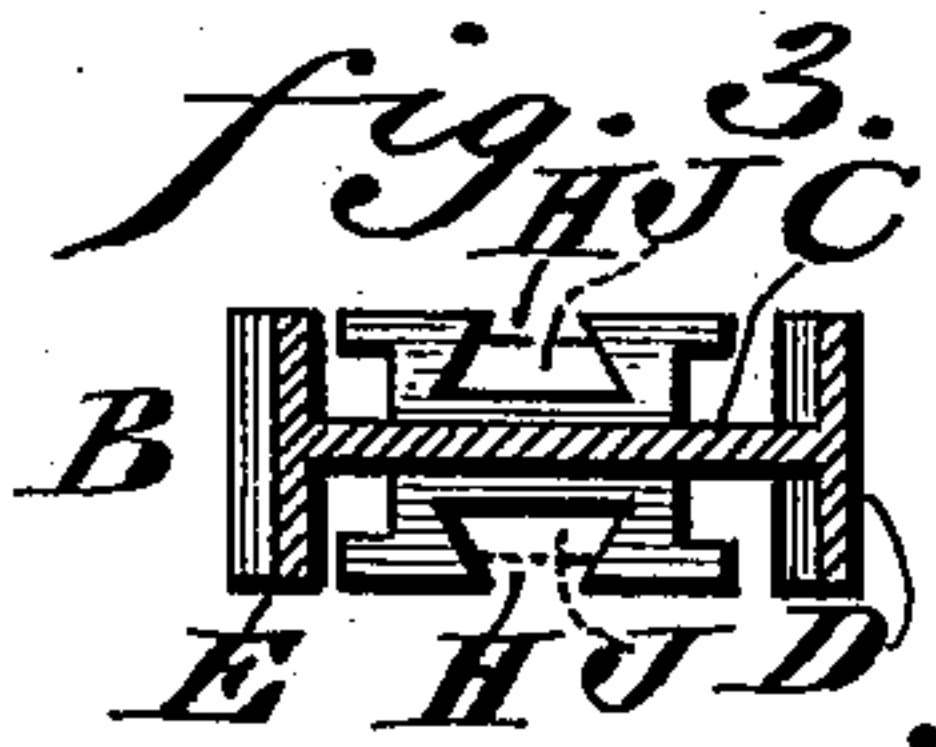
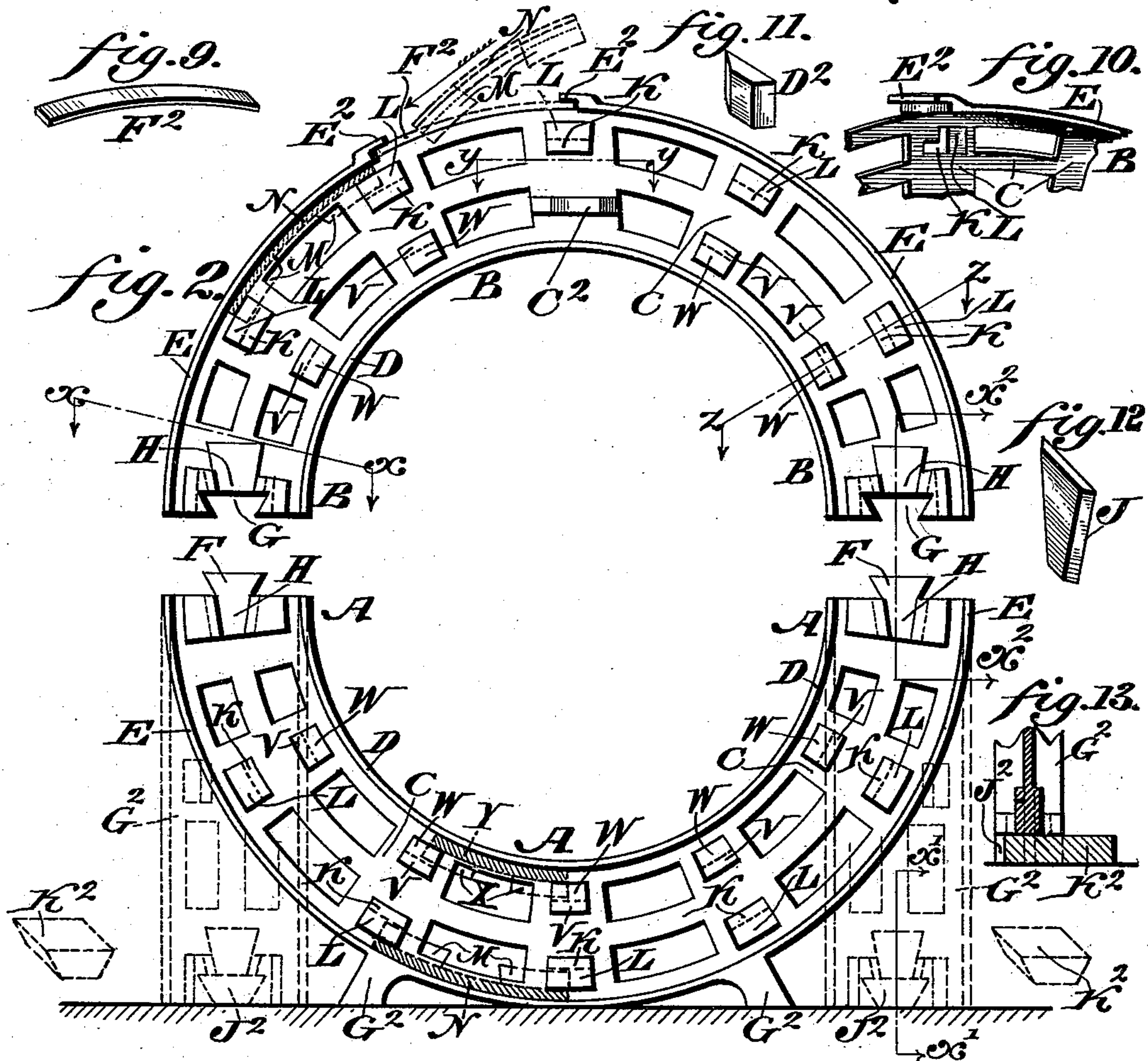
(No Model.)

2 Sheets—Sheet 2.

W. WALTER.  
CONDUIT FOR SEWERS, &c.

No. 542,865.

Patented July 16, 1895.



Witnesses

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Fig. 7. N. A diagram showing a cross-section of a structure with a central vertical line and two horizontal lines labeled M, R, and M.

fig. 8.  
his Attorney

Inventor  
William Walter  
Adlerstein.

Witnesses *fig. 7. N*  
*L. Douville,*  
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*fig. 8. T*  
 By his Attorney *William Walter*  
*John A. Jerosheim*



# UNITED STATES PATENT OFFICE.

WILLIAM WALTER, OF BRIDGEPORT, PENNSYLVANIA.

## CONDUIT FOR SEWERS, &c.

SPECIFICATION forming part of Letters Patent No. 542,865, dated July 16, 1895.

Application filed August 8, 1894. Serial No. 519,743. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM WALTER, a citizen of the United States, residing at Bridgeport, in the county of Montgomery, State of Pennsylvania, have invented a new and useful Improvement in Conduits for Sewers, Electric Wires, &c., which improvement is fully set forth in the following specification and accompanying drawings.

My invention consists of improvements in conduits which are capable of general application, but which are more especially adapted for sewers and electric wires, &c., the same consisting of inner and outer parts or frames suitably supported which are adapted to be built up in sections, the space between said frames being filled with mortar or cement, &c., after the same are placed in position, whereby the whole device becomes rigid when said mortar hardens and the conduit is practically indestructible, the disadvantages and objections arising from conduits constructed of bricks superposed one upon another, which are liable to cave in under certain conditions, being entirely overcome by my device, all as will be hereinafter set forth.

Figure 1 represents a view, partly in section and partly in elevation, of a conduit embodying my invention. Fig. 2 represents an end view of the same, the parts composing the frame being separated. Fig. 3 represents a section on line  $xx$ , Fig. 2. Fig. 4 represents a section on line  $yy$ , same figure. Fig. 5 represents a section on line  $zz$ , same figure. Fig. 6 represents a plan view of one of the outer plates. Fig. 7 represents a section on line  $yy$ , Fig. 6. Fig. 8 represents a section on line  $xx$ , Fig. 6. Fig. 9 represents a perspective view of a key. Fig. 10 represents a perspective view of the upper portion of the frame which said key engages. Fig. 11 represents a perspective view of a wedge. Fig. 12 represents a perspective view of a key. Fig. 13 represents a section on line  $xx$ , Fig. 2, the parts cut in dotted lines in Fig. 2 being shown full. Fig. 14 represents a section on line  $xx$ , Fig. 1. Fig. 15 represents a section on line  $xx^2$ , Fig. 2. Fig. 16 represents the parts shown in Fig. 15 separated. Fig. 17 represents a detail showing the means for holding the inner and outer shells rigid before the application of the mortar thereto. Fig. 18

represents a perspective view of the end of one of the inner plates.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings, A and B designates semicircular rings or sections, the same consisting of the central web C and the inner and outer flanges D and E, the lower ring A being in the present instance provided with the feet  $G^2$ .

F designates tongues which are adapted to engage the grooves G, as shown in Fig. 16, and at the joint between the upper and lower rings or sections is located the tapered recesses H, one on each side of the web C in each of said rings, which are adapted to receive the wedges J, whereby said rings A and B are securely locked together.

K designates lugs which are arranged near the outer flanges of both sections, upon each side of the web or rib C, said lugs being preferably shaped as seen in Fig. 10 especially, and having the angular-shaped portion L, which turns outwardly and is engaged by the flanges M on each end of the plates N, said plates consisting of the central portion P and the end portions Q, the same being connected by the bars R and having each end recessed at S. The inner face of the plates N has the lugs or hooks T projecting therefrom, and also the openings U adjacent thereto.

V designates a series of angular-shaped lugs arranged on each side of the webs C near the inner flanges D of said rings A and B, and in all respects similar to the lugs K, except that the angular portion W of each of said lugs V turns inwardly, and is engaged by a flange X of a plate Y which has the lugs Z and the recessed ends A' similar to the plate N.

B<sup>2</sup> designates links which are adapted to engage said lugs T and Z, and to brace the plates N and Y, Fig. 17, after the same have been placed in position. The upper portion of the ring B has the projections C<sup>2</sup> on each side of the web C, which is suitably recessed to receive a wedge or key D<sup>2</sup>, as shown in Fig. 1, which assists to lock the inner plates Y in place. The above described locking device may, however, be dispensed with if desired in some cases. The outer flange of the said ring B is provided near its top with the



transverse lips  $E^2$ , Fig. 10, by means of which the key  $F^2$  is held in place, the latter serving to lock the last of the plates N in position. When it is desired to employ the conduit for sewerage and analogous purposes, the same is preferably constructed circular in cross-section, as shown in full lines in Figs. 1 and 2.

In the preferred form for electric wires, &c., the sides of the lower portion of the conduit may be made by arranging the inner and outer plates N and Y vertically in the supporting frames or sections  $G^2$ , the construction of said frames being seen in dotted lines in Fig. 2, the plates N and Y being placed in position in the same manner as when the lower frame is semicircular, the said vertical sections  $G^2$  being provided at their upper portion with the tongue F and the recesses H for the wedge or key J, and at their bases having the grooves  $J^2$  which are engaged by the keys  $K^2$ , which may project out of said groove, as shown in Fig. 13, so as to form convenient means for securing the frames  $G^2$  at their base, a suitable foundation being provided for said frames  $G^2$  or A.

At suitable points in the conduit are the openings  $M^2$ , which are preferably formed by inserting a sleeve  $N^2$  in the openings  $F^2$  of any two adjacent plates N and Y, as seen in Fig. 17, whereby connections may be made either to the wires or to sewer-pipes leading from various points.

$P^2$  designates mortar or cement, which is placed in the space between the plates N and Y in a plastic condition and allowed to harden, whereupon the device becomes rigid and practically indestructible.

The method of constructing the sewer is as follows: The lower sections A or  $G^2$  are first placed in position at the proper distance apart, as shown in Fig. 1, and the plates N and Y inserted therein, as seen in the lower portion, Figs. 2 and 1, the said plates being inserted one by one in place in the lower sections A until a semicylindrical skeleton shell is formed, which is filled with mortar or cement. The upper sections B are then placed and locked in position by means of the tongues and grooves F and G and the keys J, and the plates N and Y are inserted, as seen in the upper portion of Fig. 2, the recesses S and  $A'$  in the ends of said plates allowing the latter to be readily moved by the lugs K or W. The last of the plates Y are locked by means of the key  $D^2$ , which may be dispensed with, however, if desired, while the last of the plates N are locked by the key  $F^2$ , the space between said plates having been properly filled with mortar, as seen in the left-hand portion of Fig. 1 especially. When the lower portion of the conduit has vertical sides, as indicated by the dotted lines in Fig. 2, the plates N and Y are preferably straight instead of being curved. Manholes may be provided at different points in the conduit, if desired, the passage from the earth line to said conduit consisting of a skeleton frame

filled in with mortar and constructed similar to the manner in which the conduit itself is built.

It is obvious that I may employ various devices other than those herein shown for connecting the plates N and Y with their supports, whereby the skeleton frames are formed, since it is evident that said plates may have hooks on their extremities to engage suitable sockets on the frames A, B, or  $G^2$ , or vice versa; and it is also evident that other changes may be made by those skilled in the art which will come within the scope of my invention, and I do not desire to be limited to the exact construction I have herein shown and described.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A conduit having a skeleton frame consisting of semi-circular end sections having locking tongues, and inner and outer plates connected to said end sections, said parts being combined substantially as described.

2. In a conduit for sewers, &c. the bottom rings or sections having the lugs V and K, on both sides of the webs of said rings in combination with the upper ring B, and means for locking said sections A and B together, and the plates N and Y connected with said lugs, and between which mortar is adapted to be placed, said parts being combined substantially as described.

3. The upper and lower sections A and B, means for locking the same together, plates N and Y for the purpose of holding mortar in place, and means for locking the last of said plates which are placed in position, substantially as described.

4. A conduit having a skeleton frame consisting of semi-circular end sections, each consisting of a central web with inner and outer flanges, and having the series of lugs V and K, tongues connected with said rings for uniting the same, and inner and outer plates having flanges for engaging said lugs, said parts being combined substantially as described.

5. In a conduit, the upper and lower rings or sections having the lugs K and V, and the tongues and grooves and locking devices substantially as described, in combination with the series of plates N and Y having the flanges M and X the recessed ends and the lugs engaging therewith, the space between said plates being filled with mortar, and the above parts combined substantially as described.

6. A conduit having a skeleton frame consisting of end portions having lugs thereon, and inner and outer plates, each having flanged ends adapted to engage said lugs, said parts being combined substantially as described.

7. In a conduit, a plate consisting of central and end portions connected by bars, the end portions being recessed, and the inner face of the said plate having projecting lugs with an adjacent opening, in combination with



end sections having flanges thereon and provided with projecting lugs substantially as described.

5 8. In a conduit the end sections, the inner and outer plates N and Y, secured at their ends to their end sections having lugs thereon, and the links B<sup>2</sup> adapted to brace said plates, said parts being combined substantially as described.

10 9. In a conduit, the plates Y the semi-circular ring B having the recessed projections C<sup>2</sup> thereon on each side of the web thereof, in

combination with the key D<sup>2</sup> for locking the said plates Y in place, substantially as described.

15 10. In a conduit the plates N, the semi-circular ring B having an outer flange with the transverse lips E<sup>2</sup> near its top, in combination with the key F<sup>2</sup> for locking the said plates N in position, substantially as described.

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Witnesses:

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R. H. GRAESER.