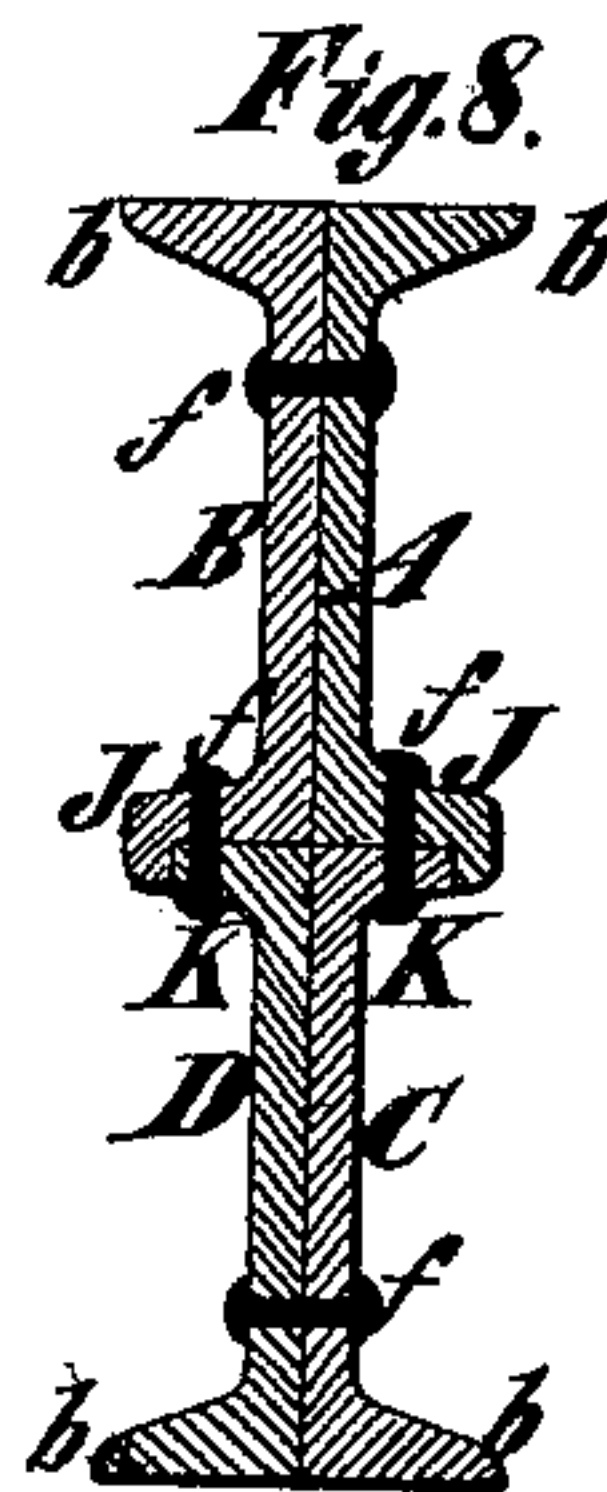
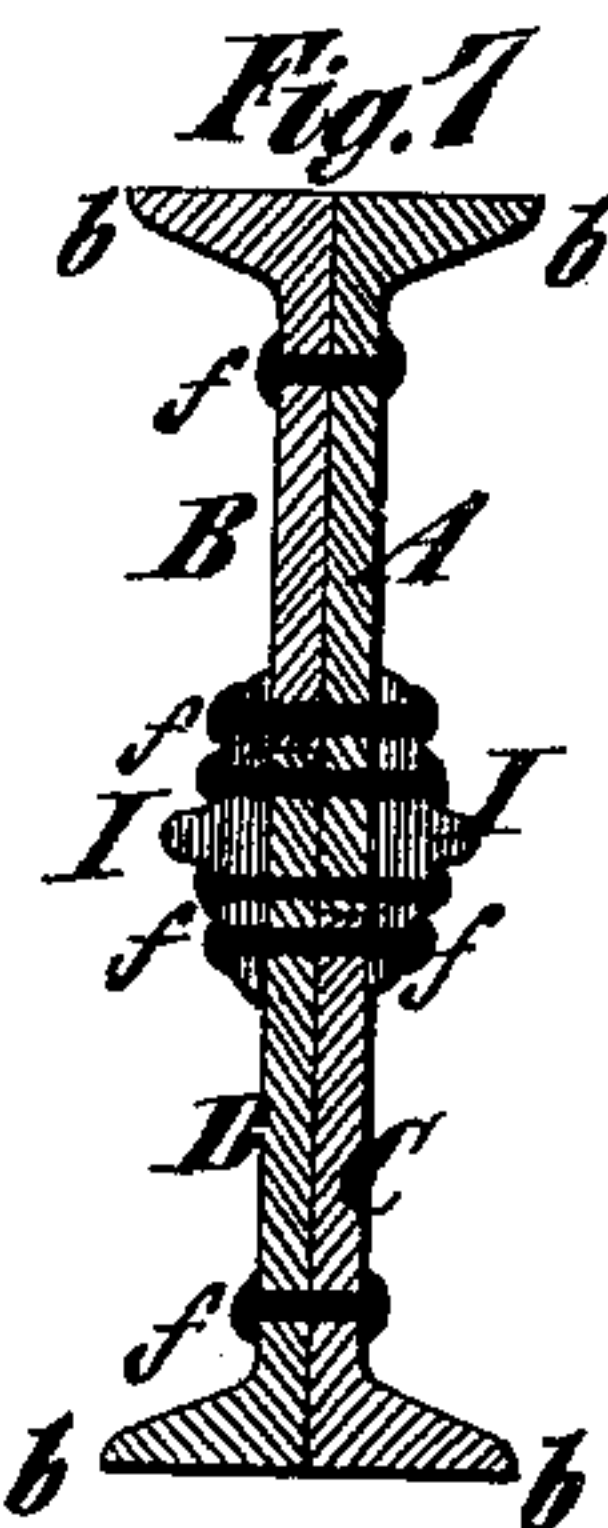
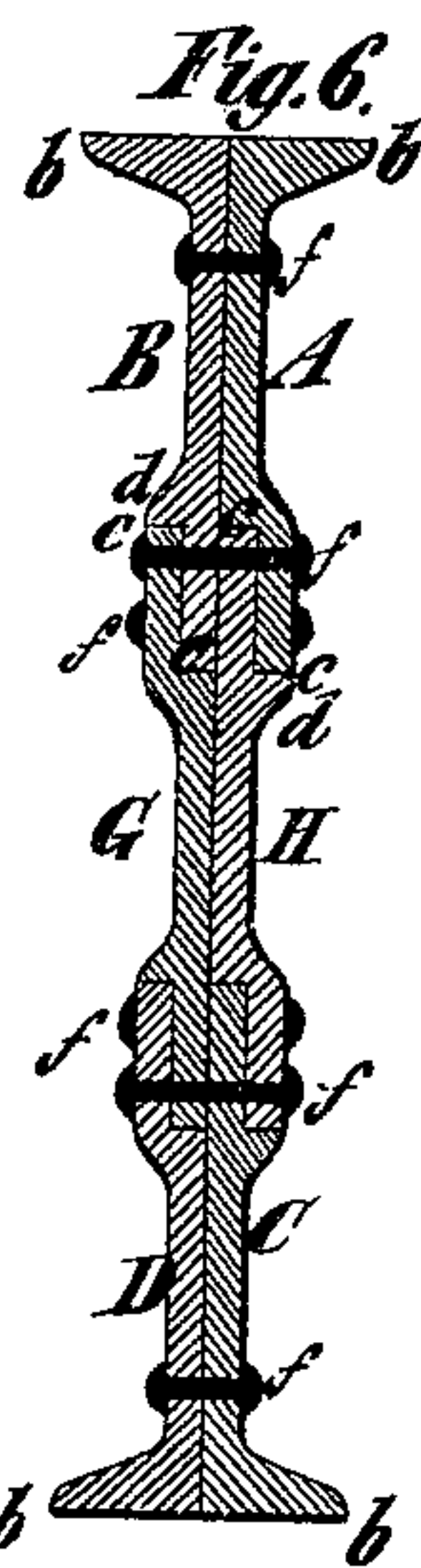
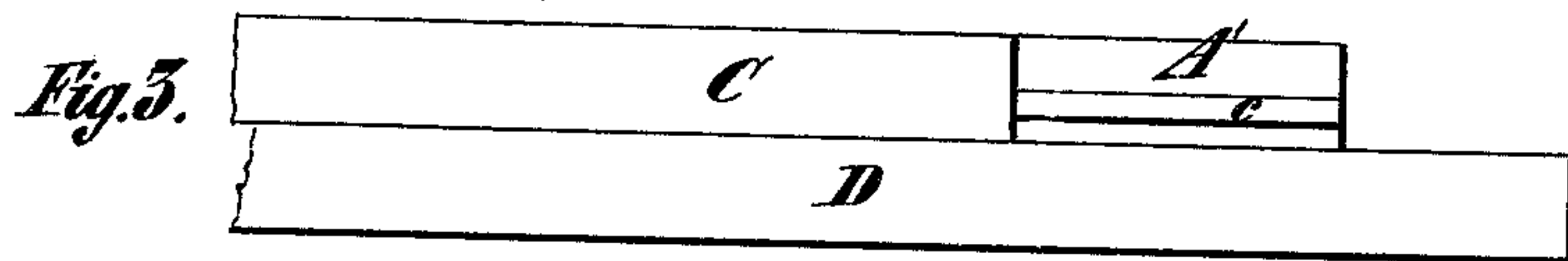
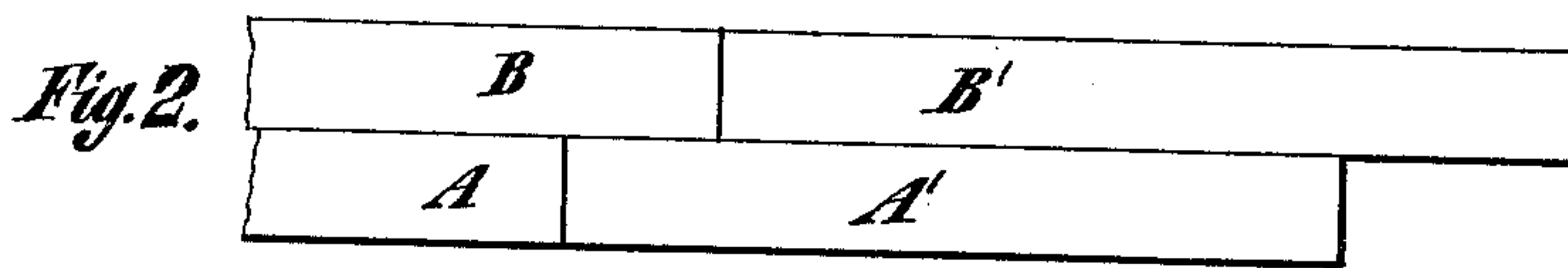
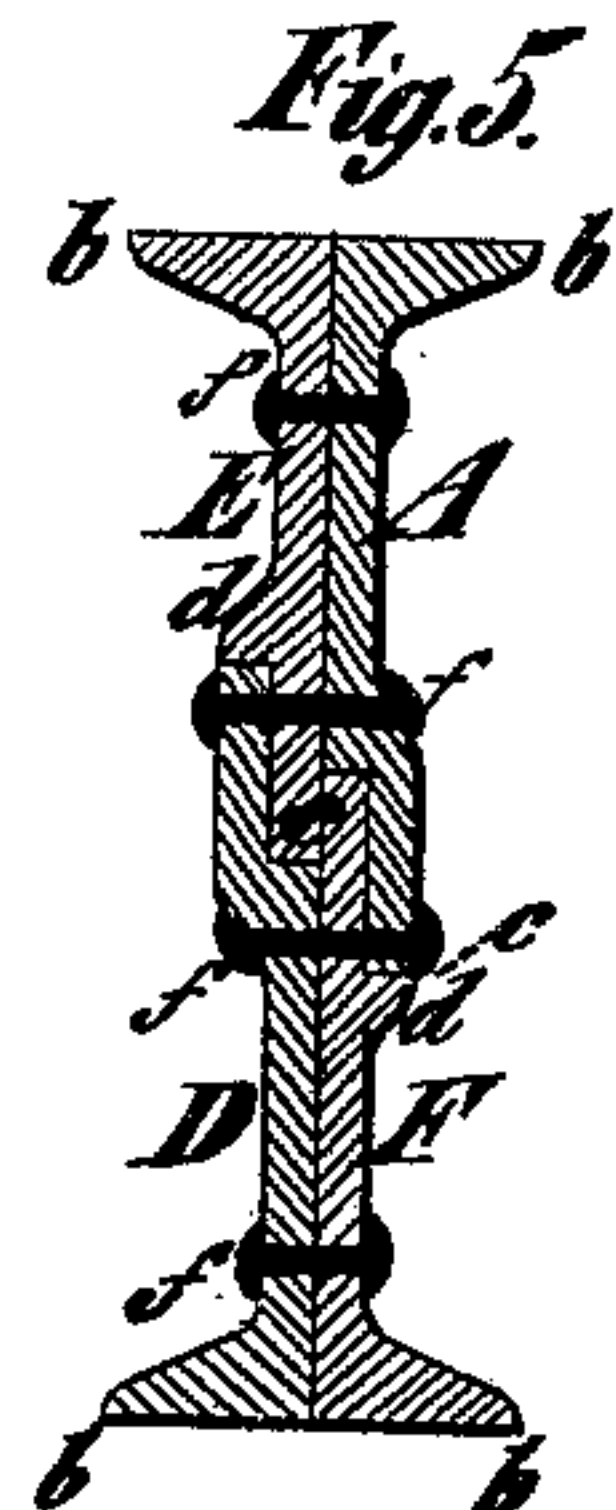
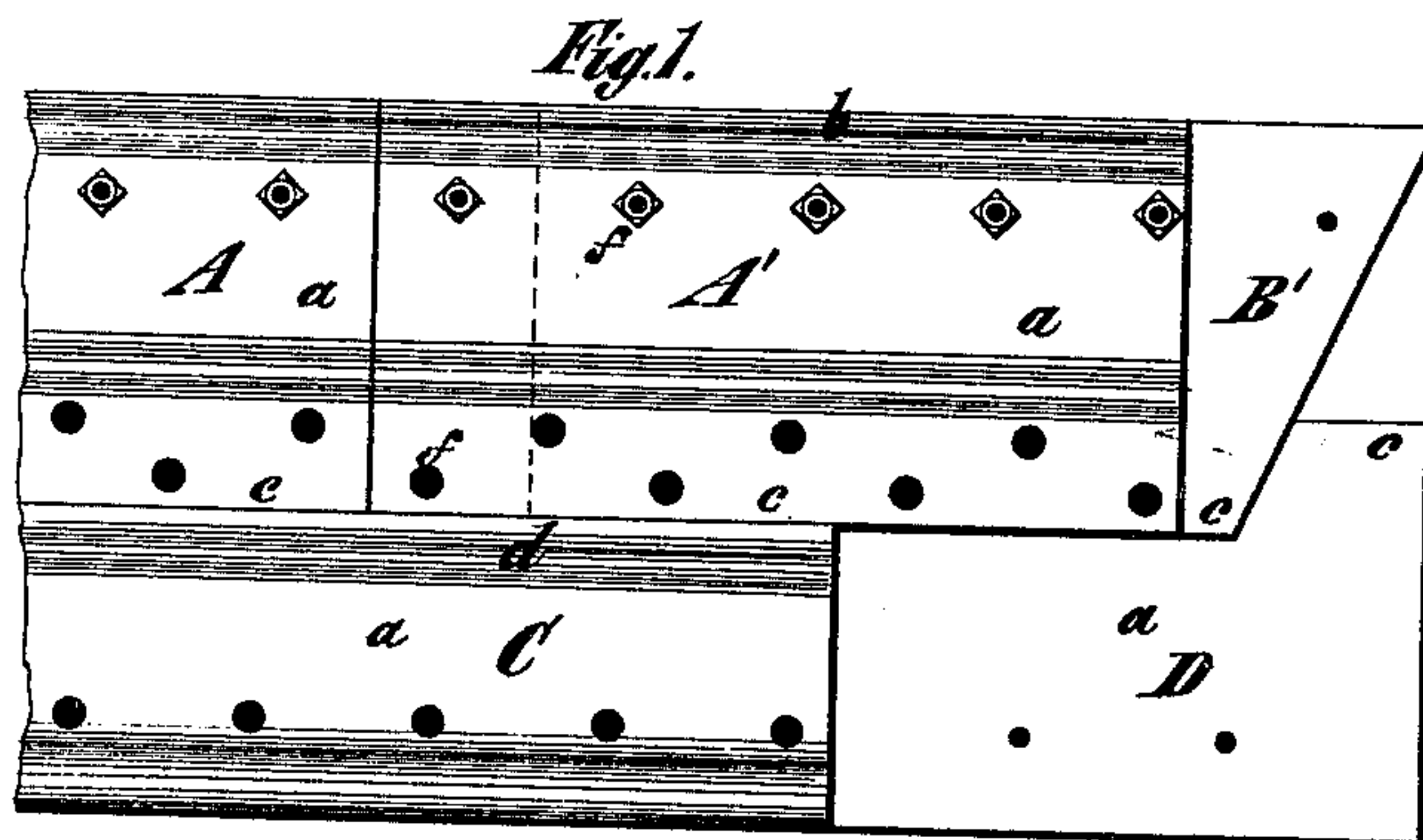
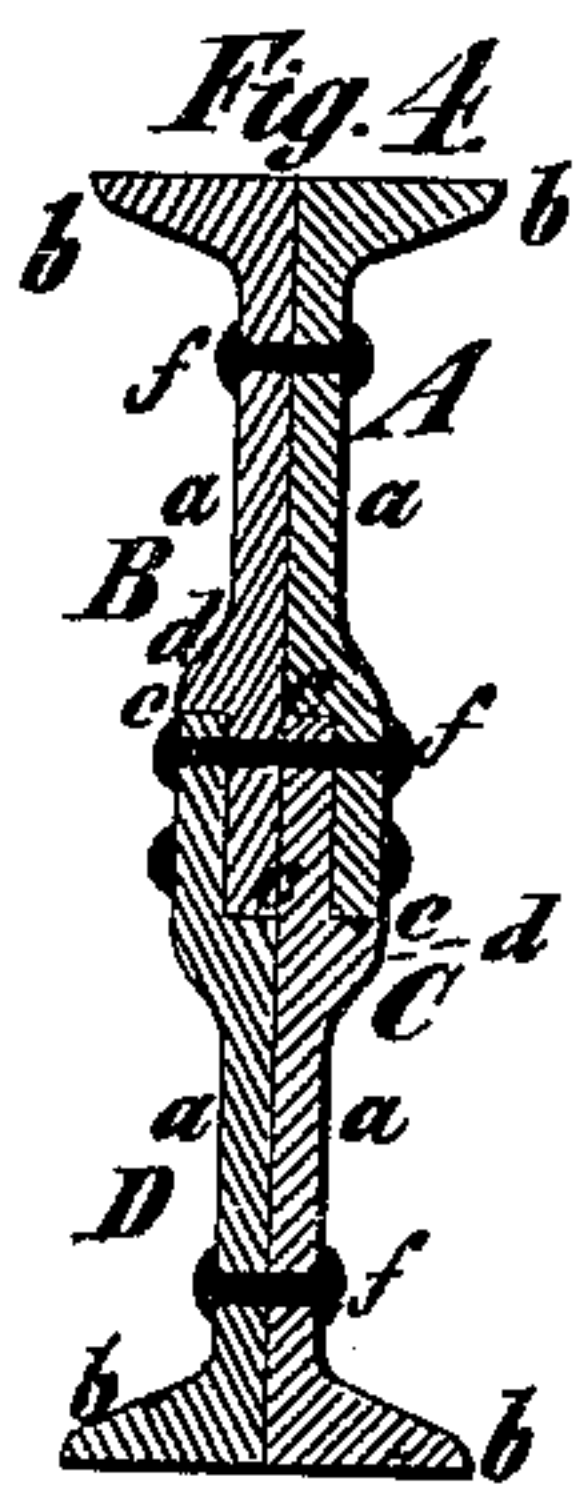


R. A. HEALY.
COMPOUND GIRDER.

No. 176,307.

Patented April 18, 1876.



Witnesses:
J. J. Keane
H. A. Chapin

Richard Albert Healy
by
Randolph & Brown
his attorneys-

UNITED STATES PATENT OFFICE.

RICHARD A. HEALY, OF PATERSON, NEW JERSEY.

IMPROVEMENT IN COMPOUND GIRDERS.

Specification forming part of Letters Patent No. **176,307**, dated April 18, 1876; application filed December 15, 1875.

To all whom it may concern:

Be it known that I, RICHARD ALBERT HEALY, of the city of Paterson and State of New Jersey, have invented certain new and useful Improvements in Compound Girders or Beams, of which the following is a description:

My invention consists in a girder or beam composed of a number of sections, made preferably of rolled iron, and arranged side by side in pairs, the several pairs being united by suitable scarf-joints at the upper or lower edge with pairs of sections situated above or below, and at either or both ends by other scarf-joints with other pairs of sections arranged in line with them, whereby I produce a girder or beam of great strength, which may, if desirable, be transported in sections to the place where it is to be used, and there erected of any desired length and depth.

In the accompanying drawing, Figure 1 is a side view of a girder, made according to my invention. Fig. 2 is a top view or plane of the same. Fig. 3 is a bottom view or inverted plan thereof. Fig. 4 is a transverse section of the same. Fig. 5 is another transverse section, illustrating a method of decreasing the depth of the girder. Fig. 6 is a transverse section of a girder of extra depth. Figs. 7 and 8 are transverse sections of girders, having their sections scarfed differently in a vertical direction.

Similar letters of reference designate corresponding parts in all the figures.

Referring, first, to Figs. 1, 2, 3, 4, and 5, A, A', B, B', C, and D designate a number of sections, composing a girder or beam.

It will be seen that the sections A and A' are in line, and the sections B and B' in line lengthwise of the girder; the section C below the sections A, A'; the section D below the sections B, B'.

I will first describe the character or shape of the sections, then the manner of scarfing or uniting them vertically together, and subsequently the manner of scarfing or uniting them horizontally together lengthwise of the girder.

Each of the several sections consists, essentially, of a flat plate or piece of iron, having along one horizontal edge a flange, *b*, which,

in conjunction with the corresponding flange of a contiguous section, forms one of the tables of the girder, and having its opposite horizontal edge *c*, formed so that it may overlap the edges of a section arranged above or below, so as to form a scarf-joint. The edges *c* of the sections A, A', and D are extended laterally outward to lap outside the edges *c* of the sections B, B', and C, and near the said edges *c* of the latter are projections or ribs *d*, against which the said edges *c* of the former bear, as may be seen in Fig. 4. Rivets or bolts *f*, or any other suitable means, may be employed to secure the several sections laterally together.

I desire to call attention to the great strength which is afforded the girder or beam by the longitudinal rib or swell formed by the scarf-joint just described.

In the girder illustrated by Fig. 5 the sections A and D are precisely like those similarly lettered in the figures just described, and the sections E and F are like the sections B, B', and C except that they are of less depth.

It is obvious that by using sections E and F instead of sections B and C in connection with the said sections A and D a girder of decreased depth may be made, with only one extra pattern or style of section.

Fig. 6 illustrates a girder of extra depth. Between the sections A, B and the sections C, D are interposed two sections, G and H, having their horizontal edges *c* so formed that in conjunction with the edges *c* of the said sections A, B and C, D they will form scarf-joints like those previously described.

Fig. 7 illustrates a girder of a slightly-modified style. Each section consists simply of a flat plate or piece of metal, having a flange, *b*, along one horizontal edge. Two sections or sets of sections, A and D, are deeper than the other two sections or sets of sections B and C, so that when united with each deep section opposite a section of less depth, the joints between them will be at different horizontal elevations. Strips or scarfs *I* extend outside each joint, and, being secured in place by rivets, bolts, or other suitable means, form a very strong joint.

Fig. 8 represents another slightly-modified form of girder or beam. The sections A and

B have at the lower horizontal edge flanges J, which extend horizontally outward, and lap downward over the sides of the flanges K, extending horizontally outward from the sections C and D. Rivets or bolts *f*, passing vertically through the flanges J and K, secure the sections together.

The sections of the girder or beam, which, in slightly modified form, I have been describing, are scarfed or united together, lengthwise of the girder or beam, in such manner that the joint between the ends of any two sections is always situated at a considerable distance from the joint between the ends of any contiguous sections, arranged either at the side of them or above or below them; and hence, one section always laps over and braces a joint between the ends of any two sections, as may be seen in Figs. 1, 2, and 3; and the several sections are very strongly and securely scarfed or united lengthwise of the girder. The ends of the sections may be either perpendicular or oblique to their longitudinal edges, as illustrated in Fig. 1.

The girders I have described are specially intended to be made of rolled iron, as in this way girders of such material may be made of very large dimensions. This will be appreciated when it is remembered that each section can be rolled of as large dimensions as hitherto a complete girder could have been rolled.

Other advantages, also, are due to this construction of a girder, however. It provides for making a girder of uniform strength and solidity throughout its length, of any desired depth and length, and affords facility for the transportation of the girder to the place where it is to be used, inasmuch as its several sections, detached from one another, may be transported in convenient quantities, and united to form a girder or beam, of any desired length and depth, at the place where the latter is required. It is obvious that the latter advantages would pertain to a girder, made in the manner described, of cast-iron or other suitable material.

I deem it well to mention that the girder or beam I have described may be cambered or arched throughout its entire length, or any suitable portion thereof, by suitably shaping the sections, of which it is composed, or it may be made of varying depth by the interposition or addition of extra sections, as illustrated in Fig. 6, at any part of its length. Also, that the ends and edges of the several sections of a girder may be scarfed together in any suitable manner, and may be so formed as to interlock or engage with one another, in which case the rivets or bolts employed to secure them would be relieved of a great deal of strain, and the girder materially strengthened.

It is obvious that this girder may be ornamented by moldings to suit the taste.

I may add that the sections of the modified girder, illustrated in Fig. 7, may be made of plates or strips of boiler-iron, having secured to them, near one horizontal edge, angle-irons of suitable shape to form the table.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A compound girder or beam, the sections of which are united edge to edge as well as side to side, so that the resulting joints are both horizontal and vertical.

2. The combination of the sections A B C D, having flanges *b*, and their meeting edges *c*, formed to interlap, and rivets, bolts, or other means for securing them together, substantially as and for the purpose herein set forth.

3. A section for a compound girder or beam, formed as described, consisting of a flat web, provided at one side and edge with a flange, and at the other with an offset, lip, or scarf, in the manner shown, for securing it to the adjacent section, the two forming one lateral half of a girder, substantially as specified.

RICHARD ALBERT HEALY.

Witnesses:

LEVI D. YORK,
JAMES LOFTUS.