

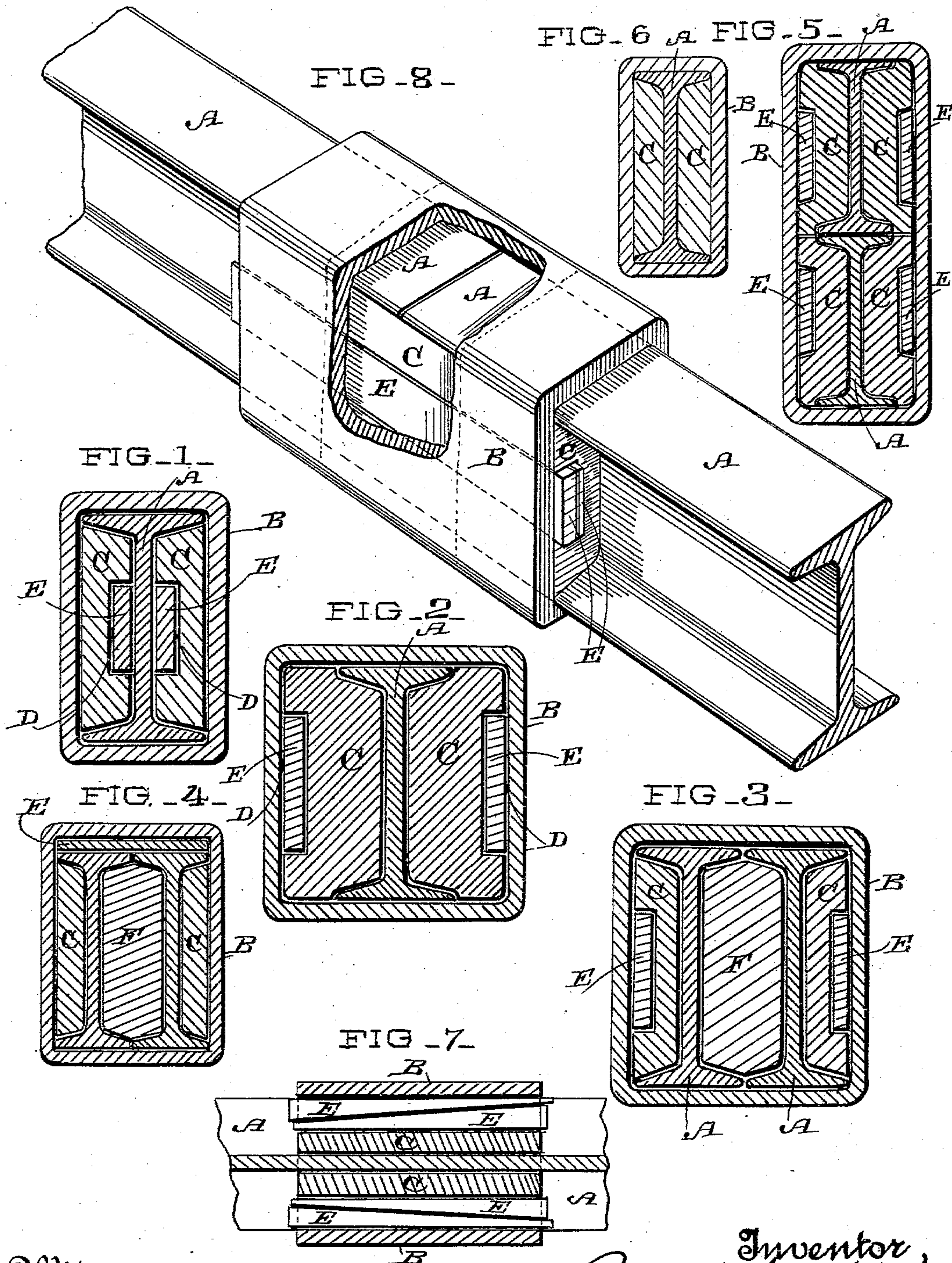
(No Model.)

P. H. JACKSON.

LENGTHENING METALLIC BEAMS AND GIRDERS.

No. 444,579.

Patented Jan. 13, 1891.



Witnesses,
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UNITED STATES PATENT OFFICE.

PETER H. JACKSON, OF SAN FRANCISCO, CALIFORNIA.

LENGTHENING METALLIC BEAMS AND GIRDERS.

SPECIFICATION forming part of Letters Patent No. 444,579, dated January 13, 1891.

Application filed October 13, 1890. Serial No. 368,000. (No model.)

To all whom it may concern:

Be it known that I, PETER H. JACKSON, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Lengthening Metallic Beams and Girders; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a means for lengthening iron and steel rolled and other metal beams or girders, and strengthening the joint at their abutting ends.

It consists of a metallic band or bands inclosing the meeting ends of girders where single beams or two or more, side by side or superposed, are employed, and in connection with these inclosing bands of cheek-pieces or filling-pieces and means for tightening the same between the bands and the girders.

It also consists in certain details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 shows single abutting beams with the inclosing and strengthening devices and wedges between the cheek-pieces and the webs of the beams. Fig. 2 shows a similar construction with the cheek-pieces extended to a greater width and wedges between the exterior of the cheek-pieces and the inclosing bands. Fig. 3 shows two beams, side by side with the cheek-pieces, wedges, and an intermediate diaphragm or separator. Fig. 4 shows the same with the wedges between the tops of the beams and the inclosing bands. Fig. 5 shows two beams, one above the other, with cheek-pieces extending on both sides of the two beams and the inclosing bands and wedges. Fig. 6 shows the band shrunk on without wedges. Fig. 7 is a horizontal section showing the keys or wedges. Fig. 8 is a perspective of Fig. 7.

This invention is especially adapted to rolled beams which are made in a single piece, but of limited length, and it enables me to substitute this class of beams for what are termed "box-girders," which are built of iron plates riveted together so as to make any desired length, but which are subject to certain weaknesses on account of the rivet-holes and their peculiar construction.

In my invention, A A represent beams, the ends of which abut together. It will be manifest that single beams, two beams side by side, or two beams arranged one above the other, or four beams in a cluster, may be abutted in this manner, and my invention is applicable to all these forms. It consists of plates extending above and below and upon the sides of the beams, as shown at B. These plates are preferably in the form of bands, of which there may be several narrow separate bands, as shown by dotted lines in Fig. 8, fitting approximately to the depth of the beams, and extending down upon each side, so as to leave spaces between the sides of the bands and the webs of the beams. I prefer however, to make the inclosing band in a single continuous piece having any suitable or desired length upon each side of the meeting or abutting ends of the beams, and the bands may either be shrunk on or fitted loosely and made tight by wedges.

Between the sides of the band or bands and the webs of the beams are fitted cheek-pieces C, the cross-section of which, as shown in the figures, is of such shape as to approximately fit and fill the spaces between the webs of the beams and the inner sides of the inclosing bands, and also the top and bottom projecting flanges of the beams. These cheek-pieces have grooves or channels made in them, as shown at D, either adjacent to the webs of the beams or, preferably, on the outside and between the cheek-pieces and the bands. Into these grooves or channels are driven wedges E, which serve to force the cheek-pieces strongly into contact with the opposite sides, which may be either the bands or the webs of the beams, and thus fit them so closely as to form a very rigid lock and support for the beam-joint. These wedges may either be single tapering wedges fitting into correspondingly-shaped grooves or channels or the grooves or channels may be made straight and two wedges driven in—one from either end. In this case the sum of the taper of the wedges will be sufficient to make an approximately-rectangular bar of the two when driven into the channel, so as to just fill the channel and produce the proper tension on the parts. Similar wedges may, if desired, be

driven between the tops of the beams and the tops of the bands, if a sufficient space be left therefor or channels made for the purpose.

If great strain is to be brought upon the abutting ends of the beams, I prefer to make the cheek-pieces, as shown in Fig. 2, wider than the width of the top and bottom flanges, so that the cheek-pieces will extend out beyond these, the bands being made proportionately wider, so as to inclose them. This gives a much stronger cross-section at this point, and it will be manifest that any suitable variation may be made of this construction to suit the conditions. When the beams are placed side by side, as shown in Fig. 3, the construction is in all respects similar; but a diaphragm or separator F is introduced between the two beams, its shape being such as to fill the hollow space formed between the webs and the top and bottom flanges of these beams, thus adding to the cross-section of metal at this point and increasing the strength proportionately by reason of the solid cross-section.

When the beams are superposed, as shown in Fig. 5, the cheek-pieces are fitted between them, as before described; but, if desired, these cheek-pieces may be each made in a single piece extending from the top of the upper beam to the bottom of the lower one. The bands are simply made of a corresponding shape, so as to inclose both beams, and the wedges are driven between the cheek-pieces and the bands, as before described. If four beams are placed together, the construction will again be similar, the bands being enlarged so as to inclose all four of the beams.

Various modifications may be made of this construction producing, essentially, the same result without materially altering the character of the invention. It will be manifest that the bands can be easily applied or removed, and, if occasion requires, the beams can be separated or replaced with very little trouble. If shrunk on, as heretofore stated, the bands will clamp the cheek-pieces firmly without wedges or other fastening and must be heated to remove them, but if fitted loosely they are

more easily removed and can be tightened by the wedges. 50

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

1. A means for lengthening metallic beams and girders, consisting of an inclosing band or bands passing around the beams at the point of junction, cheek-pieces fitting the space formed between the webs and bands and the top and bottom flanges, and means for tightening said cheek-pieces within the bands, substantially as herein described. 60

2. The means for lengthening metallic beams and girders, consisting of a metallic inclosing band or bands fitting around the abutting ends of the beams and extending a short distance along the beams each side of said joints, metallic cheek-pieces fitting the spaces between the webs and the top and bottom flanges of the beams and the innersides of the bands, wedges fitted to be driven between said cheek-pieces and bands or the webs, whereby the parts are rigidly locked together, substantially as herein described. 70

3. A means for lengthening metallic beams and girders, consisting of inclosing bands passing around the beams at the point of junction, a diaphragm between the beams and cheek-pieces fitting between the webs and bands and top and bottom flanges, and means for wedging or tightening said cheek-pieces, substantially as herein described. 80

4. A means for lengthening metallic beams, having their ends abutted together, consisting of an inclosing band or bands or casing fitting around the meeting ends of the beams, blocks fitting between the sides of the beams and the bands or casing, and wedges or keys whereby the structure may be united rigidly together, substantially as herein described. 85

In witness whereof I have hereunto set my hand. 90

PETER H. JACKSON.

Witnesses:

S. H. NOURSE,
H. C. LEE.