

(No Model.)

P. C. DOCKSTADER.
LOCKING RAIL JOINT.

No. 407,644.

Patented July 23, 1889.

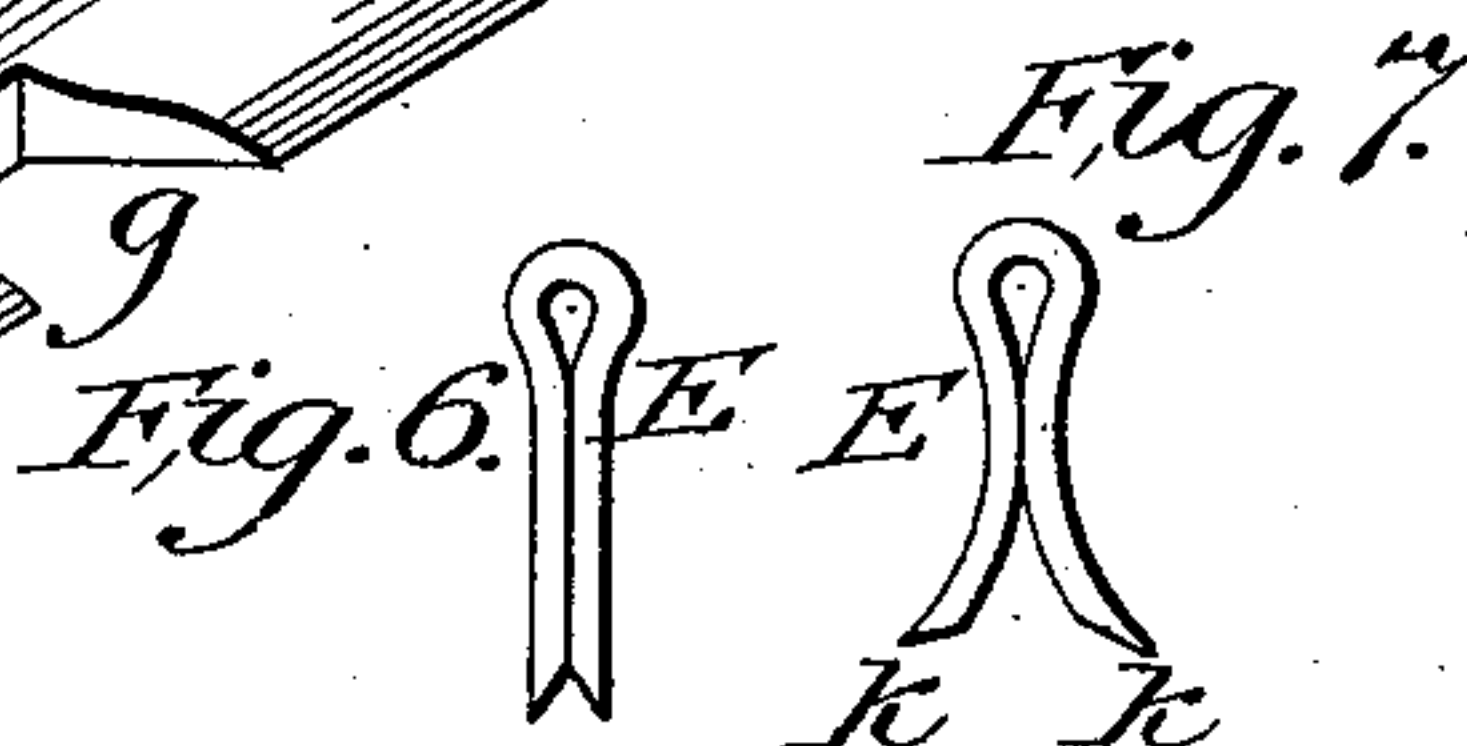
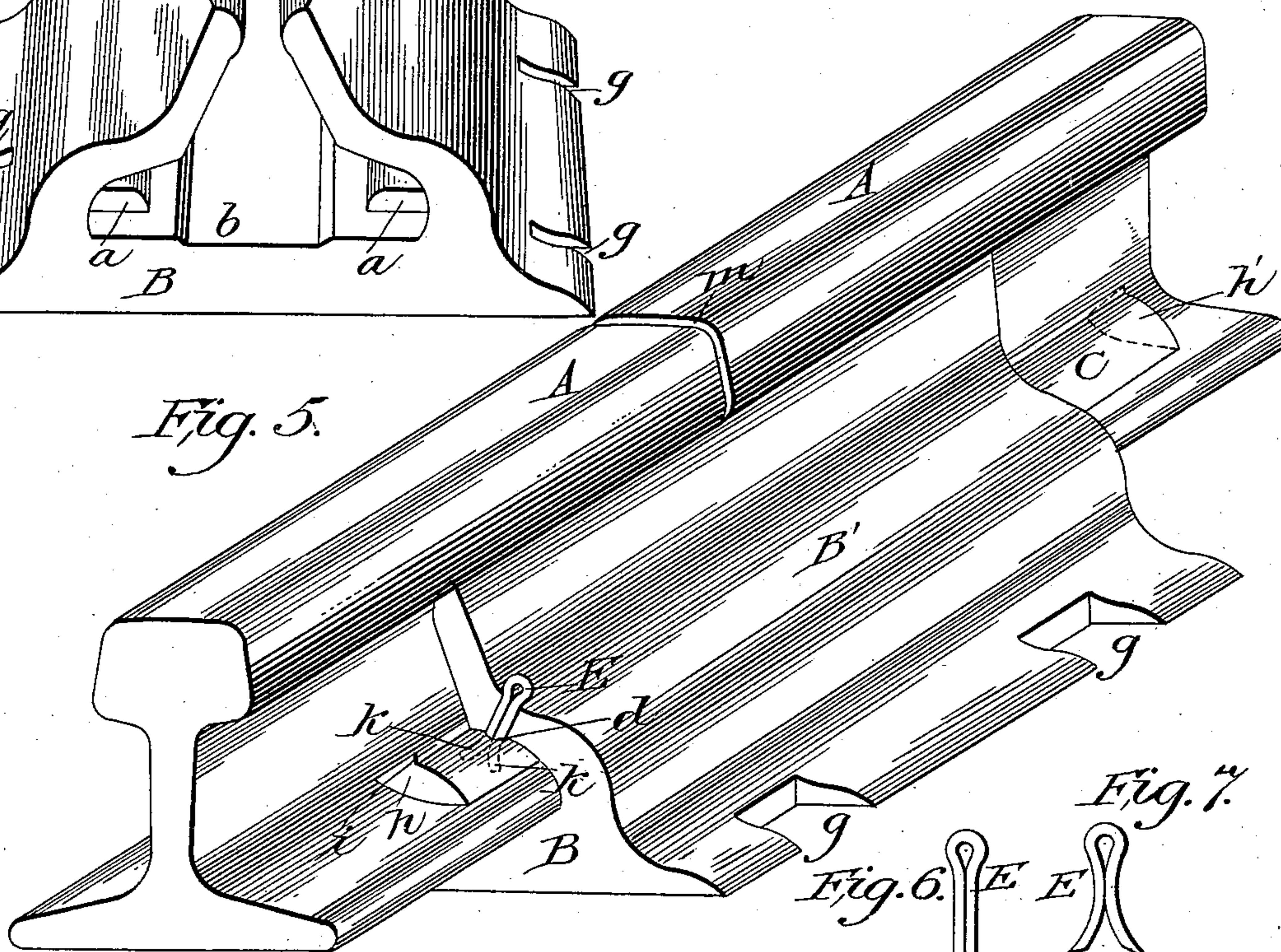
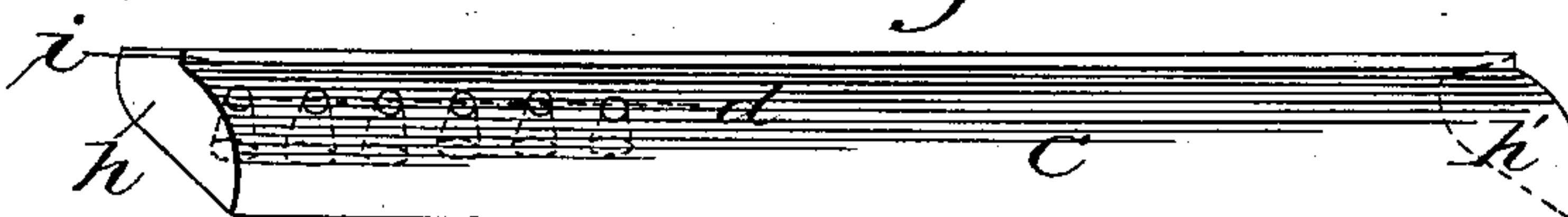
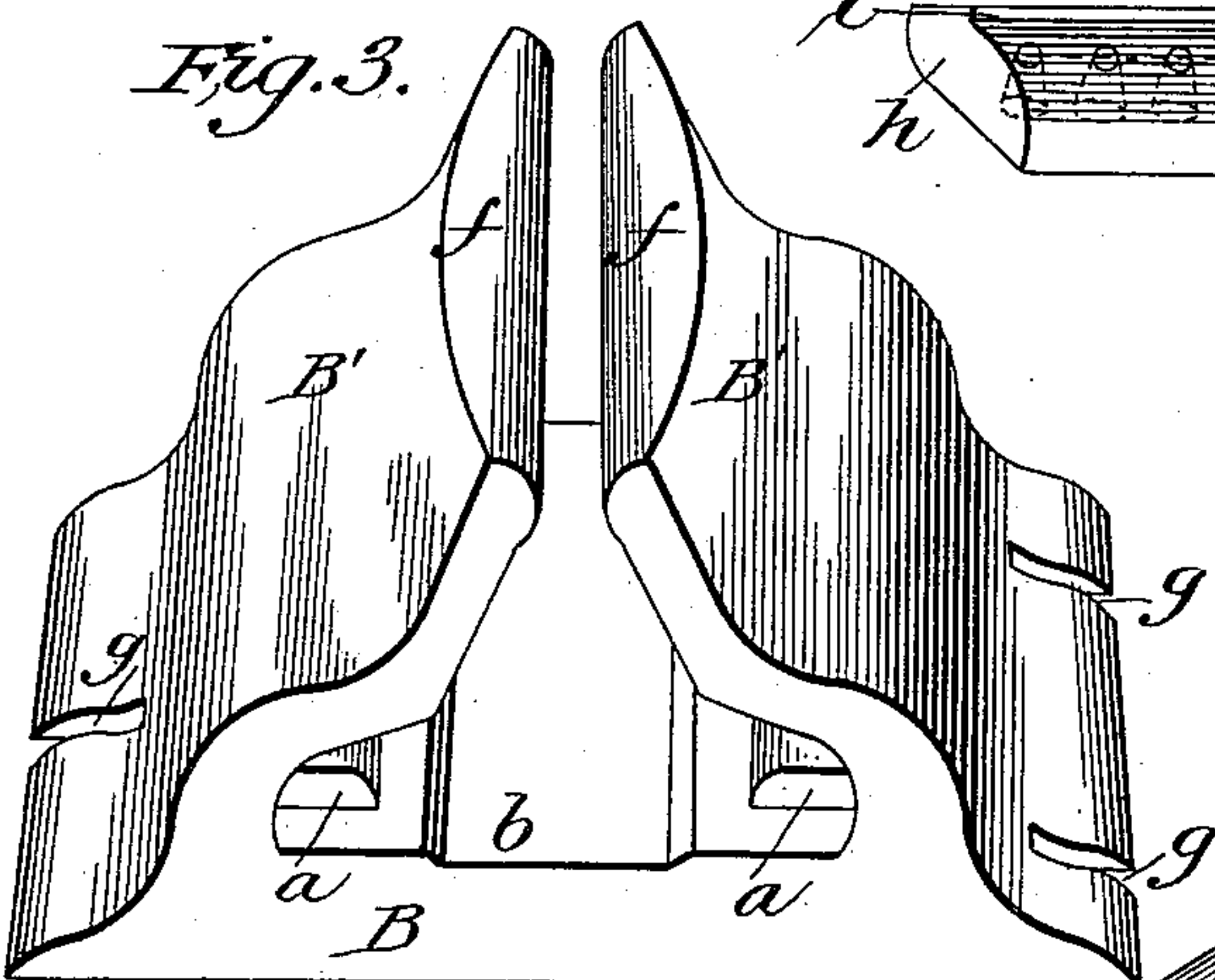
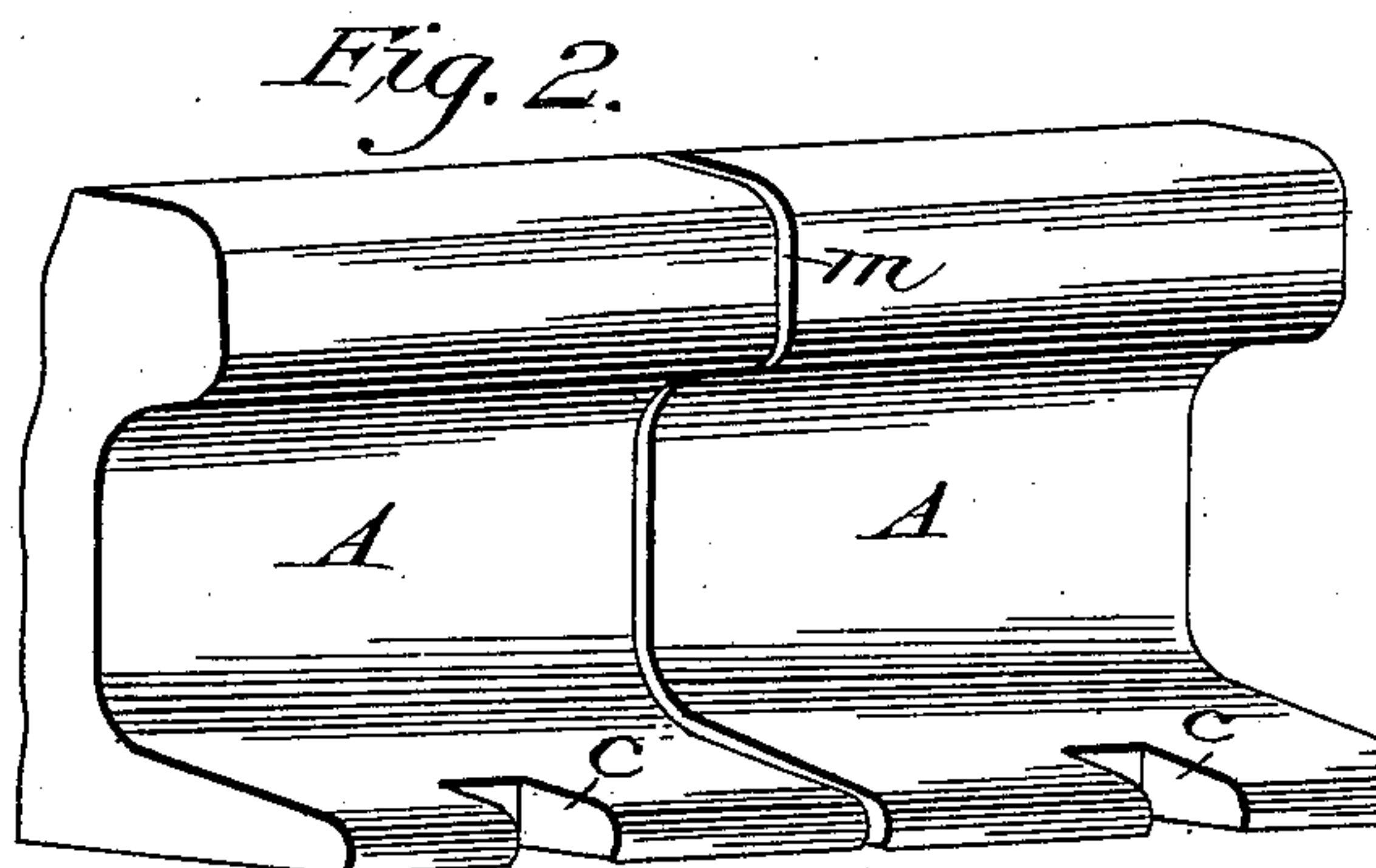
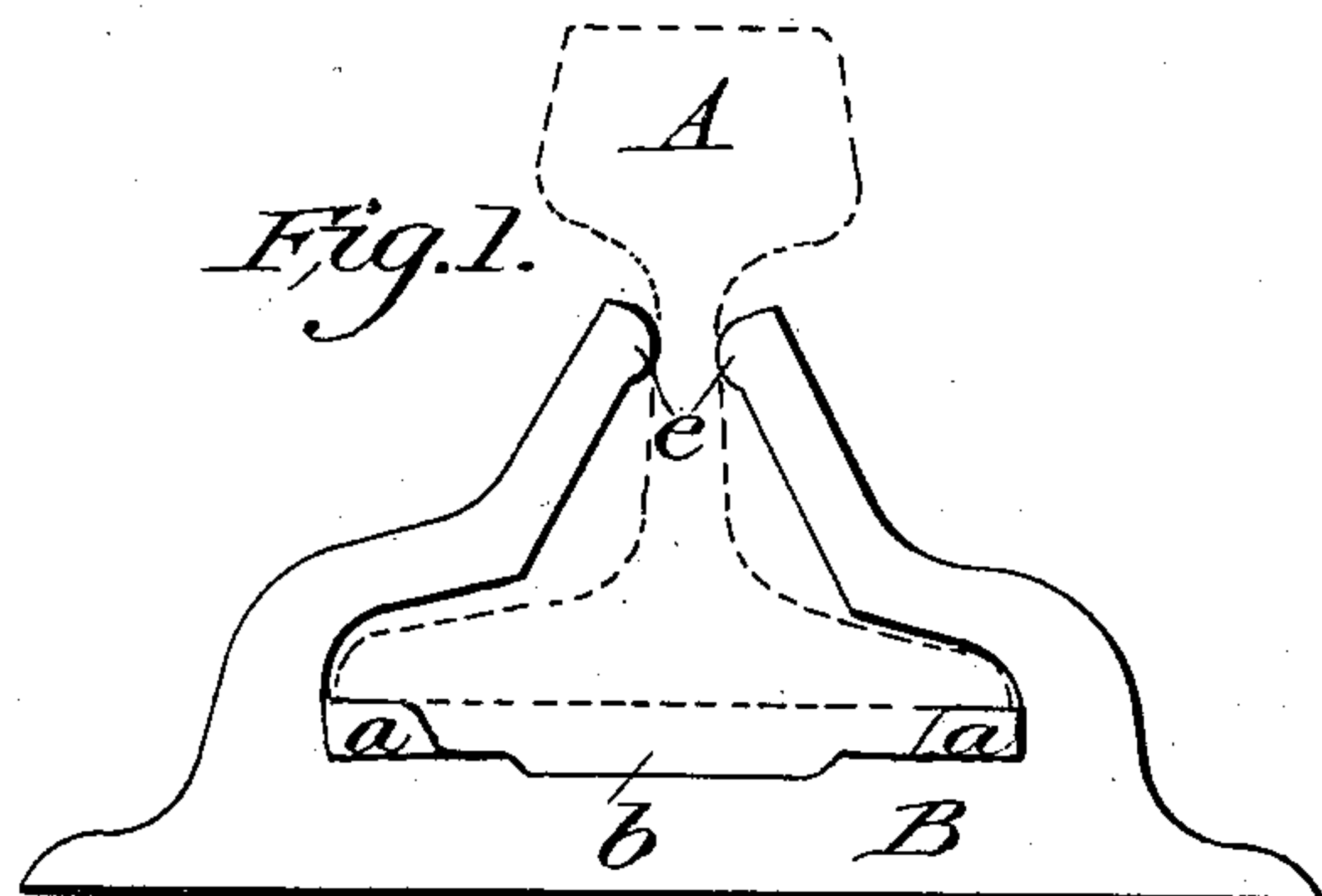


Fig. 7.

Witnesses:

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LOCKING RAIL-JOINT.

SPECIFICATION forming part of Letters Patent No. 407,644, dated July 23, 1889.

Application filed March 19, 1888. Serial No. 267,779. (No model.)

To all whom it may concern:

Be it known that I, PRESTON C. DOCKSTADER, a citizen of the United States, residing at Colorado Springs, in the county of El Paso and State of Colorado, have invented a new and useful Improvement in Rail-Joints; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to that class of rail-joints comprising a chair having upwardly-extending arms which embrace the lower part of the rail and rest against the web and the under surface of the rail, together with locking-wedges located between said arms and the upper surface of the rail-flanges.

The invention consists in the matters hereinafter described, and pointed out in the appended claims.

In the accompanying drawings, Figure 1 is an end elevation of the chair, showing the rail in dotted lines. Fig. 2 is a perspective view of the ends of the rails when placed together. Fig. 3 is a perspective view of the chair illustrated in Fig. 1. Fig. 4 is a perspective view of one of the wedges employed for locking the rail ends in the chair. Fig. 5 is a perspective view of the complete joint. Figs. 6 and 7 are views of the key used for locking the wedge in position.

As illustrated in said drawings, A A indicate the ends of the rails to be joined, and B indicates a chair, which may be made of cast-iron, wrought-iron, steel, or other suitable metal. Said chair is intended to rest upon and to be secured to the ties, and is for this purpose provided with notches or slots *g g*, Figs. 3 and 5, which may be engaged by spikes driven into the ties. The said chair B is provided with upwardly-extending arms B' B', which are attached to the base part of the chair, at the side margins of the same, and are inclined upwardly and inwardly toward the junction of the web with the rail-head. The upper ends of said arms are located at such distance apart as to admit the web of the rail between them and closely fit against the same, and the arms are made of such length that their upper ends rest in contact with the under surface of the rail-head when

the rail rests upon the flat base of the chair. The spaces or recesses between the lower parts of the arms and the base of the chair, into which the rail-flanges are inserted, are made considerably deeper than the thickness of said flanges, and within the said spaces or recesses, at the outer part of the base of the chair, are located integral lugs *a a*, adapted to engage notches *c c*, Fig. 2, formed in the rail-flanges near the ends of the rails A A. In inserting the rail ends within the chair said rail ends are thrust into opposite ends of the chair over the tops of the lugs *a a*, and the ends of the rails are then allowed to drop, so as to engage the said lugs with the notches *c c*. Said notches are made slightly wider than the lugs, to allow sufficient play in the rails during expansion and contraction of the same. The chair-arms B' B' are preferably made of greater thickness at their centers than at their ends, as indicated at *f f*, Fig. 3, thereby giving increased strength to the same.

C C are locking-wedges, which are inserted between the outer and lower parts of the chair-arms and the marginal parts of the rail-flanges. The said chair-arms are provided at their lower parts adjacent to the chair-base with bearing-surfaces for the wedges which overhang the rail-flanges and conform to the tapered form of the locking-wedges C C; or, in other words, are longitudinally inclined with reference to the base of the chair. The formation of the inclined bearing-surfaces, overhanging the rail-flanges at the lower part of the chair-arms in the manner described, obviously produces a bend or angle at the inner surfaces of said chair-arms as the chair is viewed in cross-section, as clearly shown in Figs. 1, 3, and 5. The said inclined bearing-surfaces of the chair-arms, furthermore, are oppositely inclined upon the two arms of the chair, and the wedges C C are driven between the rail-flanges and the chair-arms from opposite directions. The driving of the wedges in the manner described acts to bind or clamp the margins of the rail-flanges securely to the base of the chair and to force the top of the chair-arms at their edges *f f* firmly against the rail-head. The locking-wedges C are held in position and prevented from working out by the jarring of the rails by means of split keys E E, one of which is driven into each

wedge through one of the several holes D D therein, and is locked by the spreading of the ends of the key when it strikes the flange of the rail, as clearly shown in Fig. 7 and in Fig. 5 by the dotted lines *k k*. The holes D D in the wedge are preferably made of funnel shape and tapered inwardly and downwardly, so that they are larger at their inner or lower than at their upper or outer ends, as shown by the dotted lines in Fig. 4, thereby enabling the ends of the split key to more easily open or spread apart when driven against the rail-flange in the manner above described.

As a further and additional improvement, the inclined bearing-surfaces formed upon the inside of the chair-arms to engage the wedges C C are arranged at a somewhat greater inclination transversely than the opposing upper surfaces of the rail-flanges, and the said wedges C C are made tapering in cross-sectional form and thinner at the outer than at their inner edges, as clearly shown in the drawings, Figs. 4 and 5. The inner edges of the wedges, or those adjacent to the webs of the rails, furthermore, are extended inwardly, so as to bear against the rails at the junction of the rail-flanges with the webs. By this construction the wedges not only serve to clamp the rail-flanges downwardly against the base of the chair, but the wedges at opposite sides of the rail also serve to clamp the rail centrally between the chair-arms, thereby rigidly holding the ends of the rail from shifting or moving laterally within the chair.

It will of course be understood that the chair-arms are constructed to fit against the upper part of the web to hold the rail from lateral movement, and the lower ends of the rail-flanges are also fitted as closely as possible to the lower part of the chair-arms for the same purpose. The said wedges, arranged as described, however, serve to additionally hold or clamp the ends of the rails from any lateral movement with relation to each other or with relation to the chair, thereby not only preventing lateral displacement of one rail with reference to the other, but preventing any lateral bending or flexing of the joint, which might otherwise occur in case the rail were not clamped within the chair by wedges acting both horizontally and vertically.

As a further means of firmly clamping the rails, each locking-wedge C is provided with a rib *i*, Figs. 4 and 5, along its upper and inner edge or corner. Said rib engages the inwardly-extending angle or corner of the chair-arm (which is formed at the intersection of the inclined bearing-surface thereof with the inner surface of the upper part of the arm, as above described) as the wedge is driven, and thus acts as a guide when driving the wedge into position, and also serves to more strongly hold the rail ends and wedges from lateral displacement, it being entirely obvious that the outer surface of said rib forms a positive stop or shoulder bearing laterally against the chair-arm to

prevent outward yielding or movement of the wedge or any part thereof under a strain upon the ends of the rails.

As a further and separate improvement, I construct the chair B with a channel or depression *b*, Figs. 1 and 3, extending throughout the entire length of the upper surface of the base of the chair, said channel being of less width than the base of the rail, so as to form bearing-surfaces or ledges, upon which the margins of the rail-flanges rest, while the center part of the rail is free from contact with the chair. This construction is employed in order to distribute the blows or concussions produced by the wheels of passing trains to the marginal parts of the chair, thus preventing the center of the chair-base from taking the principal strain produced by the load upon the rail, it being entirely obvious that the rail-flanges being somewhat yielding the principal strain from concussive action and blows upon the rails will, in the use of a flat base plate or support beneath the rail, be transmitted by the rigid rail-web to the center part of the base-plate, while the greater elasticity of the laterally-projecting flanges will relieve the side margins of the plate of a large part of the strain. In a chair provided with a central channel or depression in the manner above described the pressure upon the rail is transmitted equally to both sides of the chair, and is thus distributed equally to all parts of the base of the same.

One important advantage obtained by the construction of the rail-joint above described is that movement of one of the rail ends relative to the other one is better provided against than heretofore by employing chair-arms arranged to engage the under surface of the rail-head and to afford vertical support therefor, in connection with a chair-base arranged to engage the rail-base, and wedges located between the rail-flanges and the said chair-arms, and acting to clamp the said flanges against the base of the chair. By the employment of these features of construction the rail ends are engaged with or clamped to the chair at four points—namely, at the under surface of the head at both sides of the web, and at the outer edges of each rail-flange, whereby the strains produced by blows of the wheels of passing trains are distributed equally to all parts of the chair, which immediately engage the rails—namely, the upper ends of the chair-arms and the side margins of the chair-base. The clamping of the outer edges of the rail-flanges against the base of the chair furthermore has the effect of rigidly securing the chair to the rails at points of the rail most remote from the rail-web, it being entirely obvious that the attachment of the rail to the chair at points remote from the central line of the rails is more likely to produce a rigid joint than when the clamping devices employed are located near such central line, as usual in joints heretofore made, wherein the attaching devices are

connected solely with the rail-web, or are located adjacent thereto.

The lugs *a a*, arranged upon the side margins of the base of the chair and adapted to engage in notches in the rail-flanges, in the manner described, serve to limit the extent to which any rail-section may creep under the continuous action thereon of trains moving in the same direction. To allow sufficient movement of the rails in expansion and contraction of change of temperature, however, the slots in the rail-flange are made somewhat wider than the lugs, in the manner hereinbefore stated.

An obvious advantage obtained by the construction herein illustrated is that no bolts or nuts are used, and the making of holes through the web of the rail, which obviously tends to weaken the rails near their ends, is avoided, which at the same time, by the employment of the chair made as described, in connection with the wedges held by keys, the parts of the joint may be easily put together and securely held from displacement by jarring or otherwise.

The locking rail-joint described may be used either with the joint resting on a tie, or as a suspension-joint with the chair located midway between the ties. As a suspension-joint, it would be perhaps preferable in cold climates, for the reason that a suspension-joint is not as solid or rigid, and would therefore be more desirable for use in a country where the ground freezes very hard.

The joint is of great advantage for use as a suspension-joint, inasmuch as the rail has no bolt-holes through its web, and being locked on three sides is as firm as any part of the rail.

The lower or outer base of the chair *B* may be made either flat or thicker in its central part, as may be found necessary when used as either a suspension or supported rail-joint. The details of construction in the joint may obviously be varied from those shown in the accompanying drawings without departure from my invention; and I therefore do not wish to be limited to the exact features of construction illustrated, except as the same may be embraced in my invention as herein claimed.

I claim as my invention—

1. The combination, with the track-rails, of a chair provided with two arms embracing the rails and resting against the under surface of the heads of the rails, said arms being

provided with longitudinally-inclined bearing-surfaces opposite the rail-flanges, wedges driven between the rail-flanges and the chair-arms and bearing laterally against the rail-web, said wedges being provided with a series of holes, and split keys driven into the said holes of the wedges against the rail, substantially as described.

2. The combination, with the track-rails provided with notches *c c* in their flanges, of a chair provided with two arms embracing the rails engaging the under surface of the head thereof, said arms being provided with longitudinally-inclined bearing-surfaces opposite the rail-flanges, and with lugs *a a*, formed upon the base of the chair adjacent to the chair-arms and adapted to engage the said notches *c c* of the rails, and wedges inserted between the said inclined bearing-surfaces of the chair-arms and the rail-flanges, substantially as described.

3. The combination, with the track-rails, of a chair provided with two arms embracing the rails, and having a recess or channel extending lengthwise of the upper surface of the base of the chair and forming bearing-surfaces or ledges upon which the flanges of the rails rest, substantially as described.

4. The combination, with the track-rails, of a chair provided with two arms embracing the rails and engaging the under surface of the head thereof, said arms being provided at their lower parts with longitudinally-inclined bearing-surfaces opposite the rail-flanges, and wedges driven between the said inclined bearing-surfaces and the flanges and bearing laterally against the rail-web, said wedges being provided with funnel-shaped holes, substantially as described.

5. The combination, with the track-rails, of a chair provided with upwardly-extending converging arms on opposite sides of the rail constructed to engage the under surface of the rail-head, said arms being provided with longitudinally and transversely inclined surfaces opposite the rail-flanges, and having edges or corners at the inner margins of said inclined surfaces, and locking-wedges provided with ribs *i i*, constructed to engage the said edges or corners of the chair-arms, substantially as described.

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Witnesses:

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