

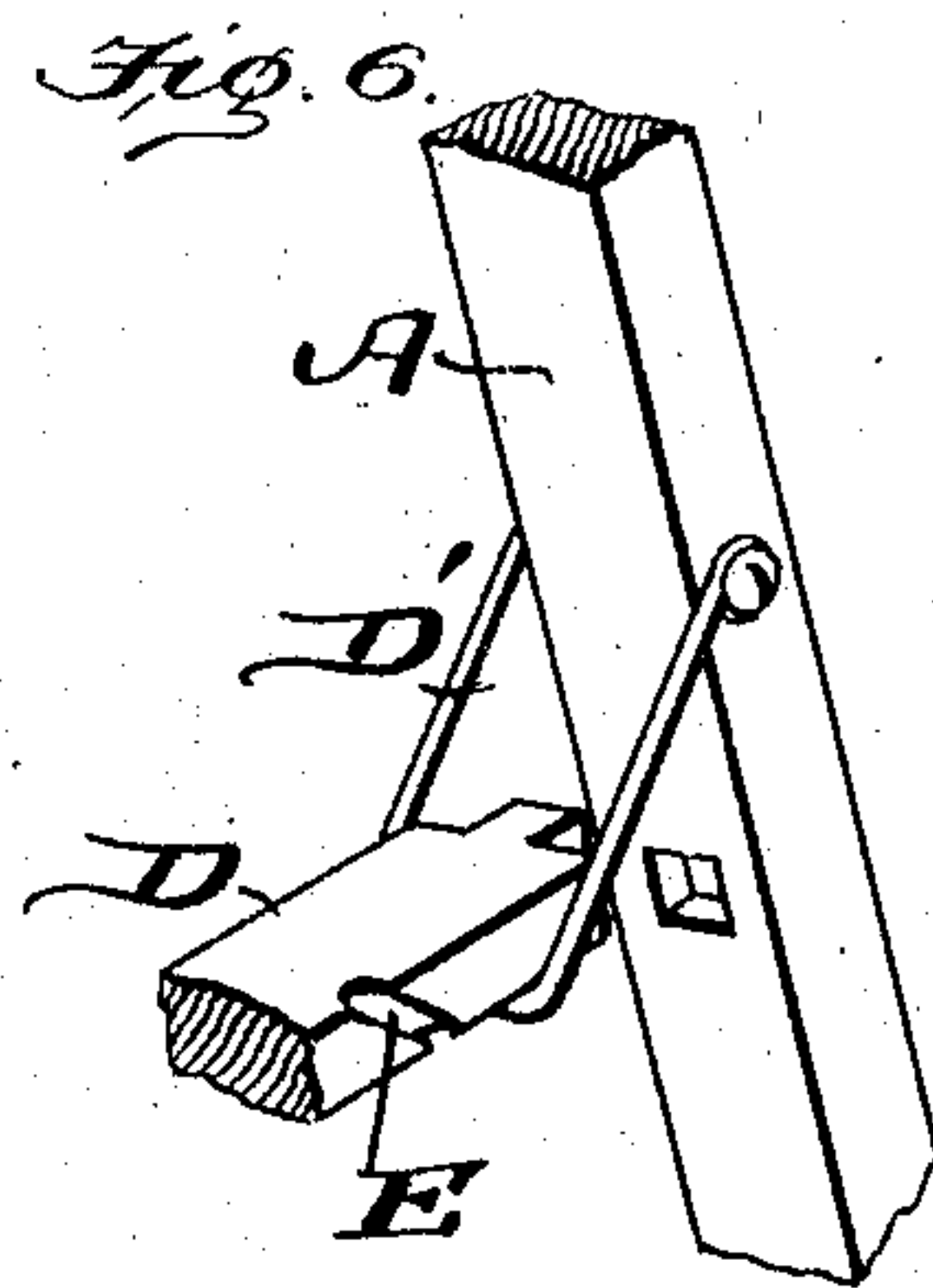
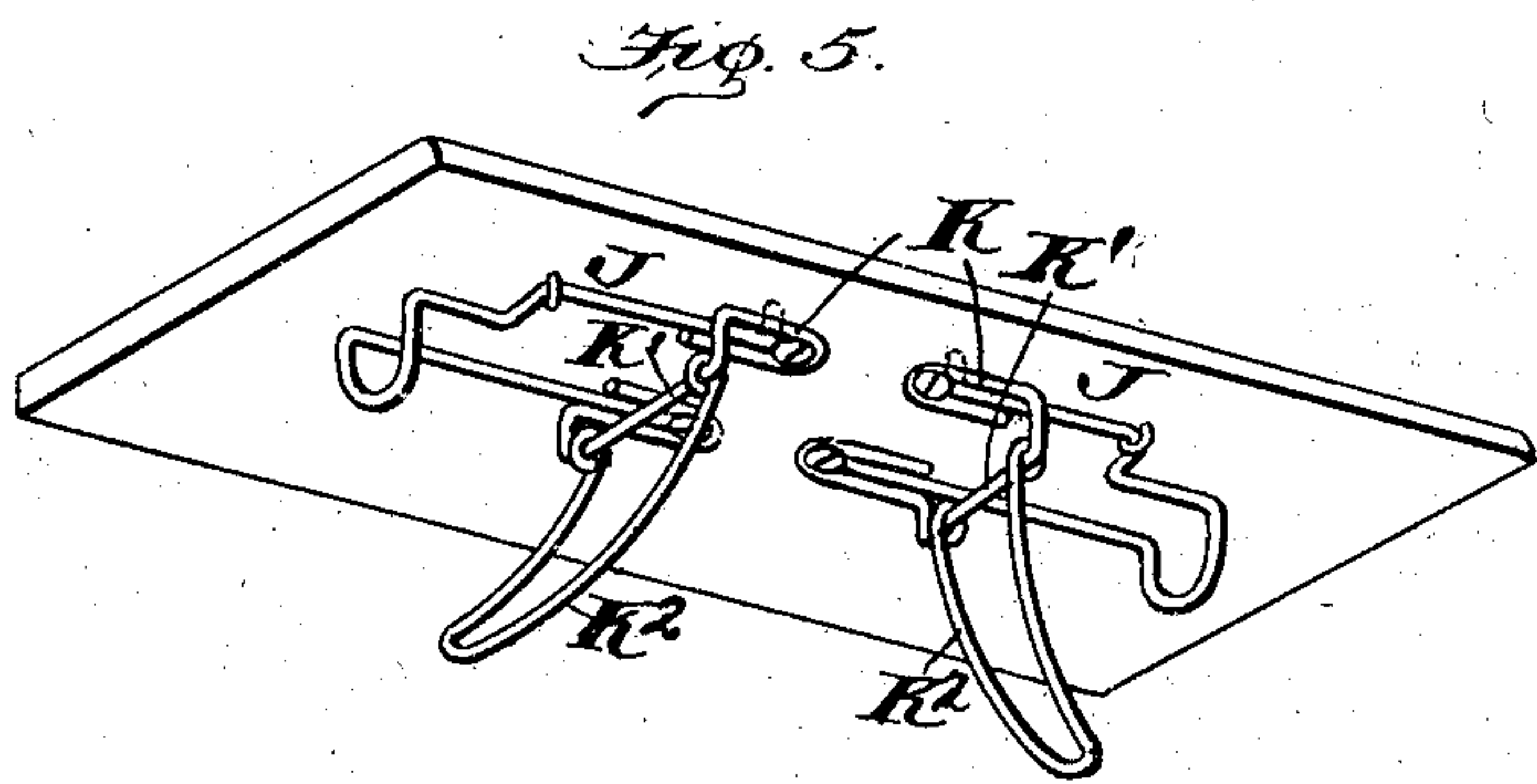
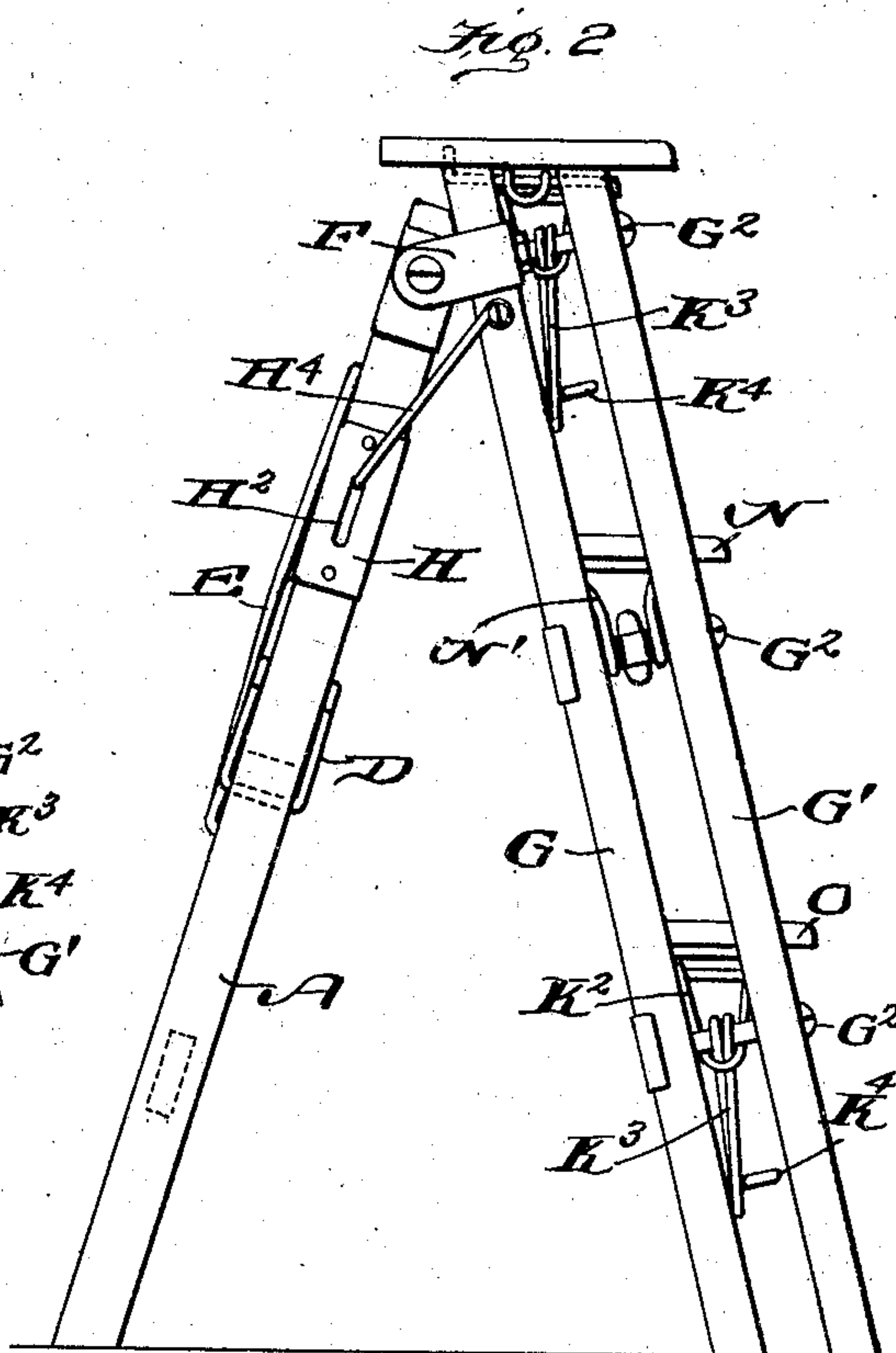
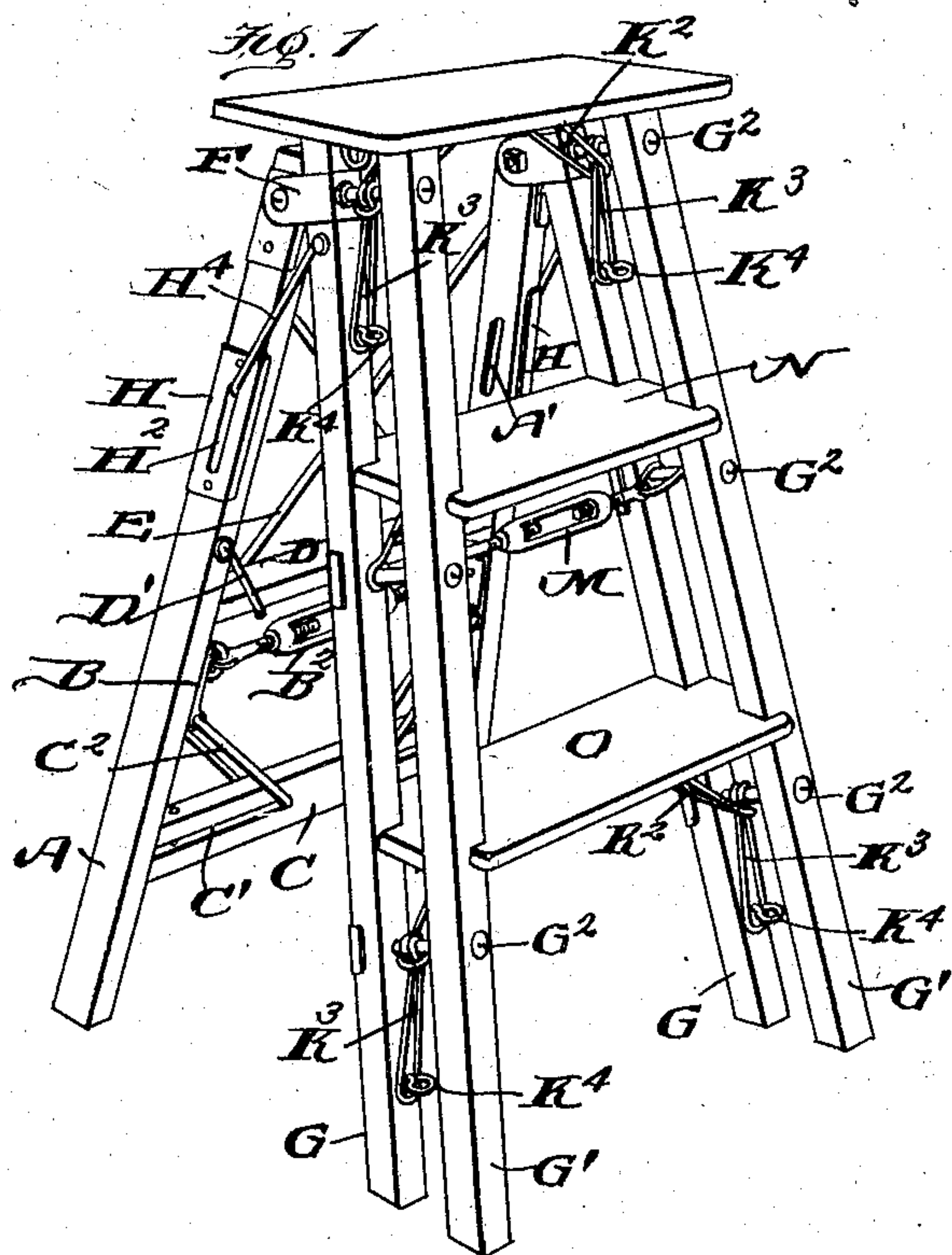
No. 791,509.

PATENTED JUNE 6, 1905.

J. G. SOERGEL.
STEP LADDER.

APPLICATION FILED DEC. 12, 1903.

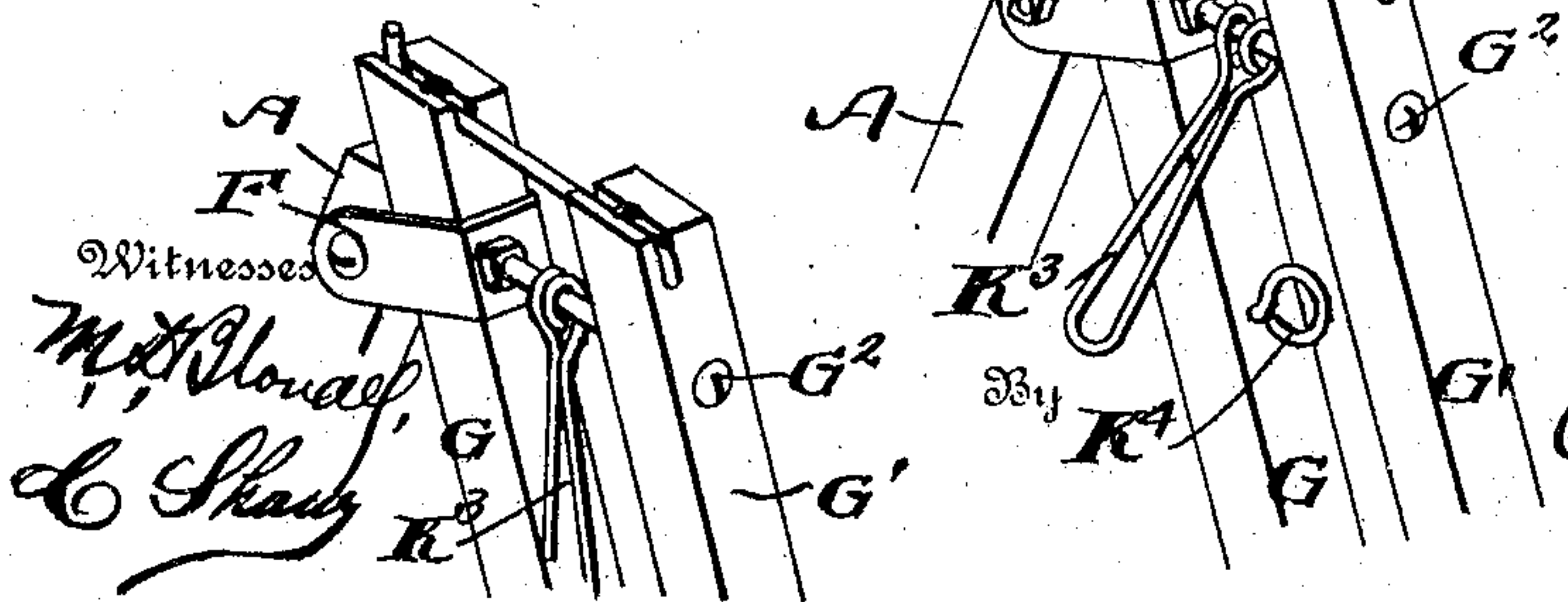
2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 3.

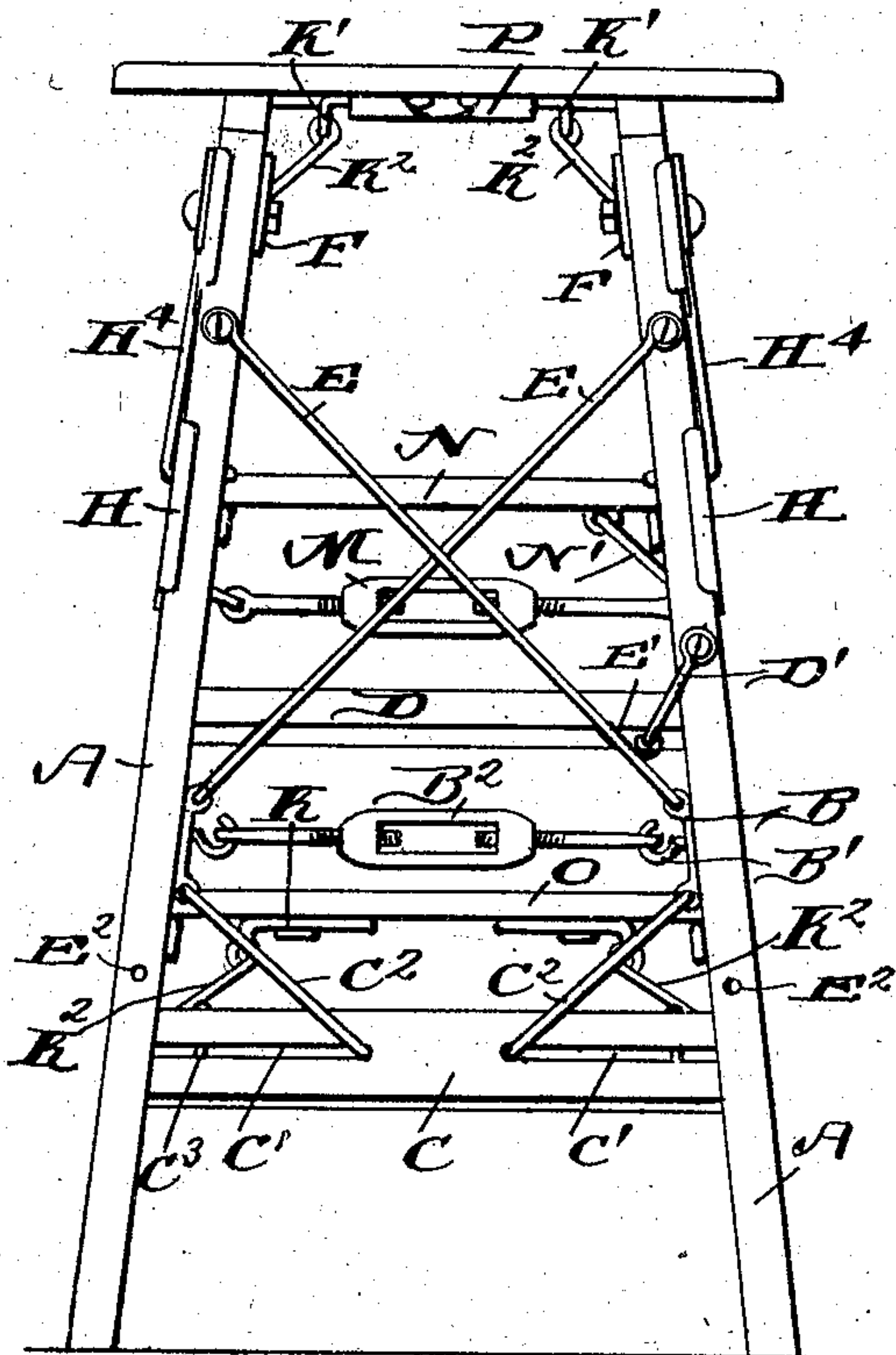


Fig. 4.

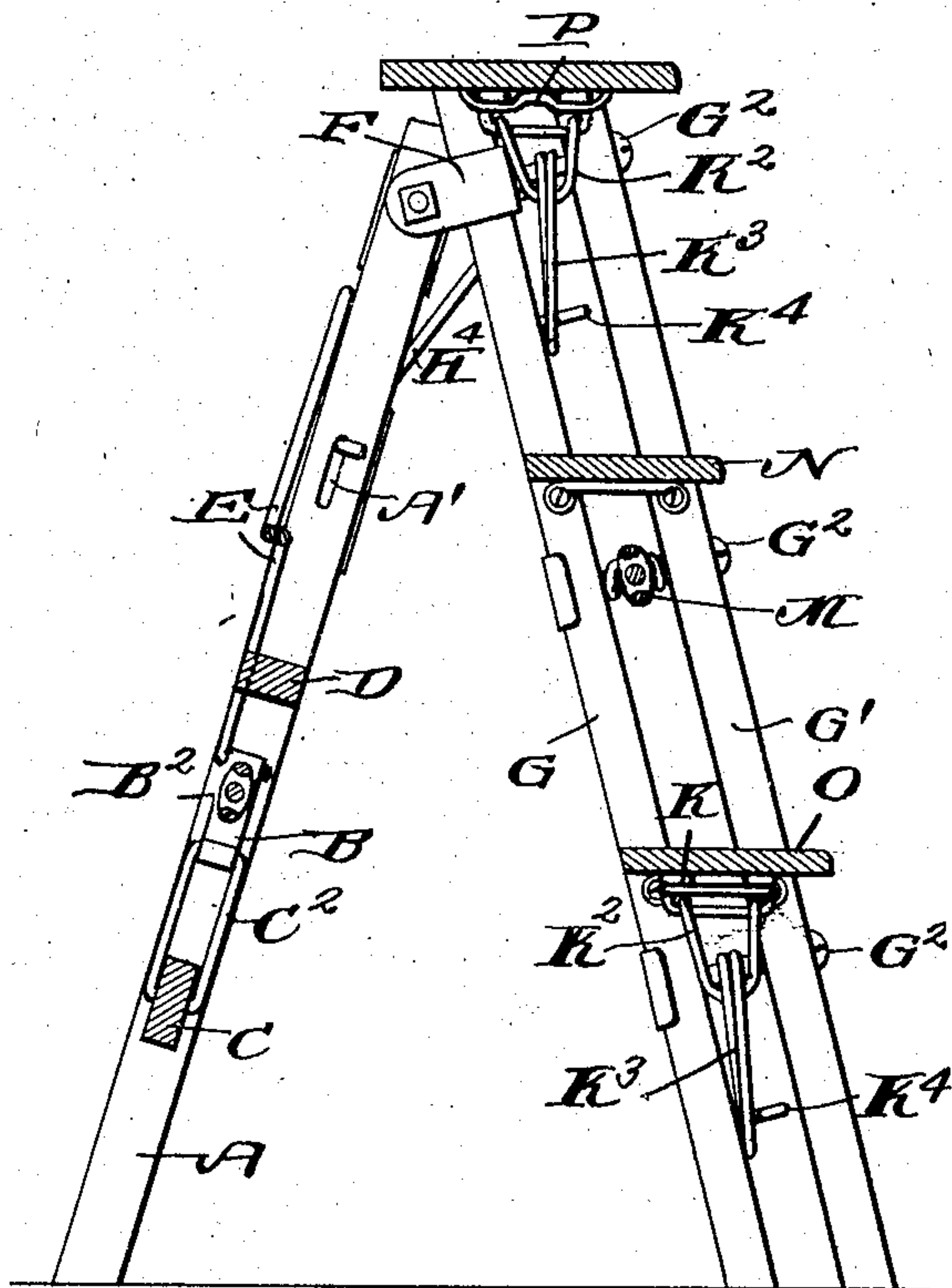


Fig. 7.

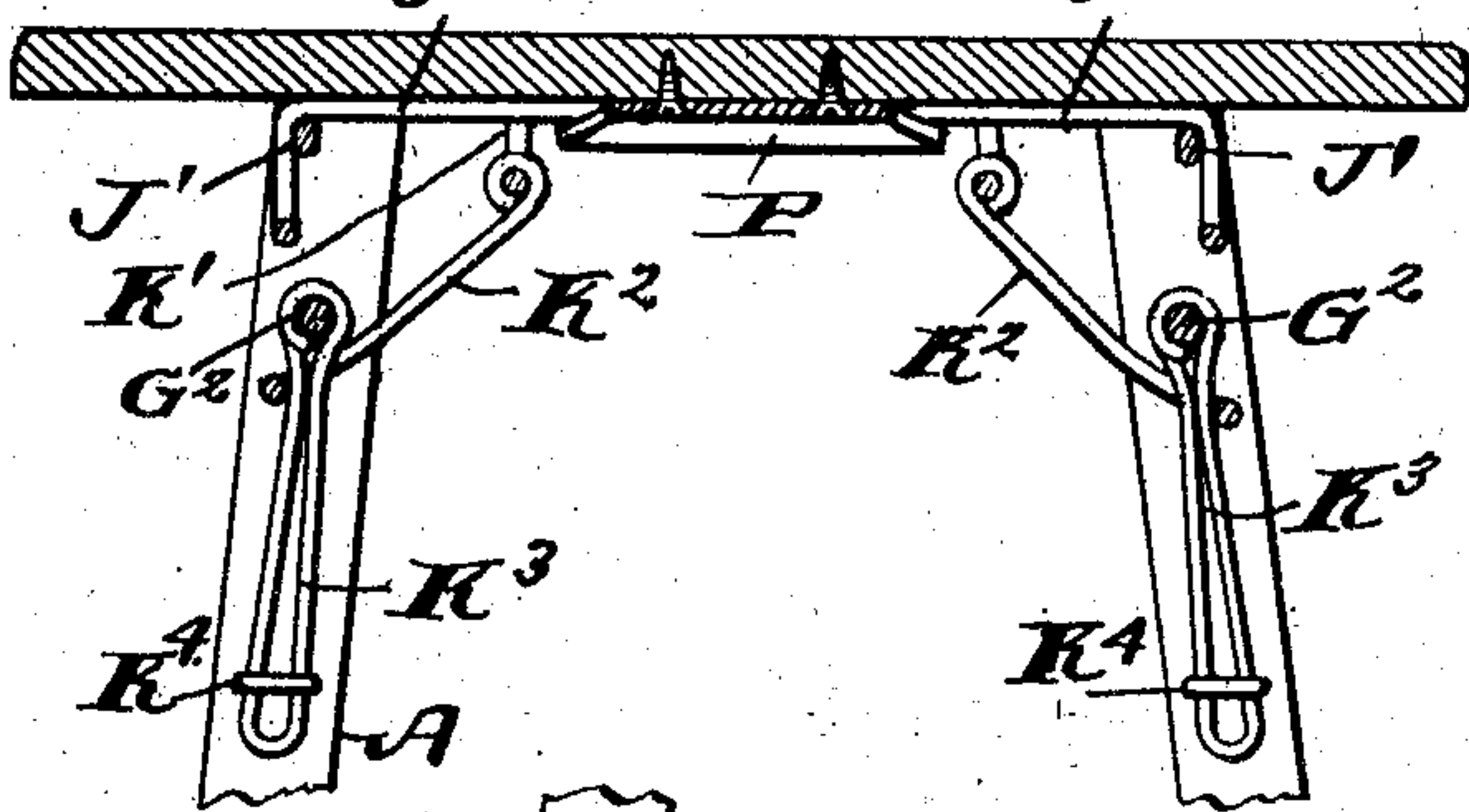


Fig. 8.

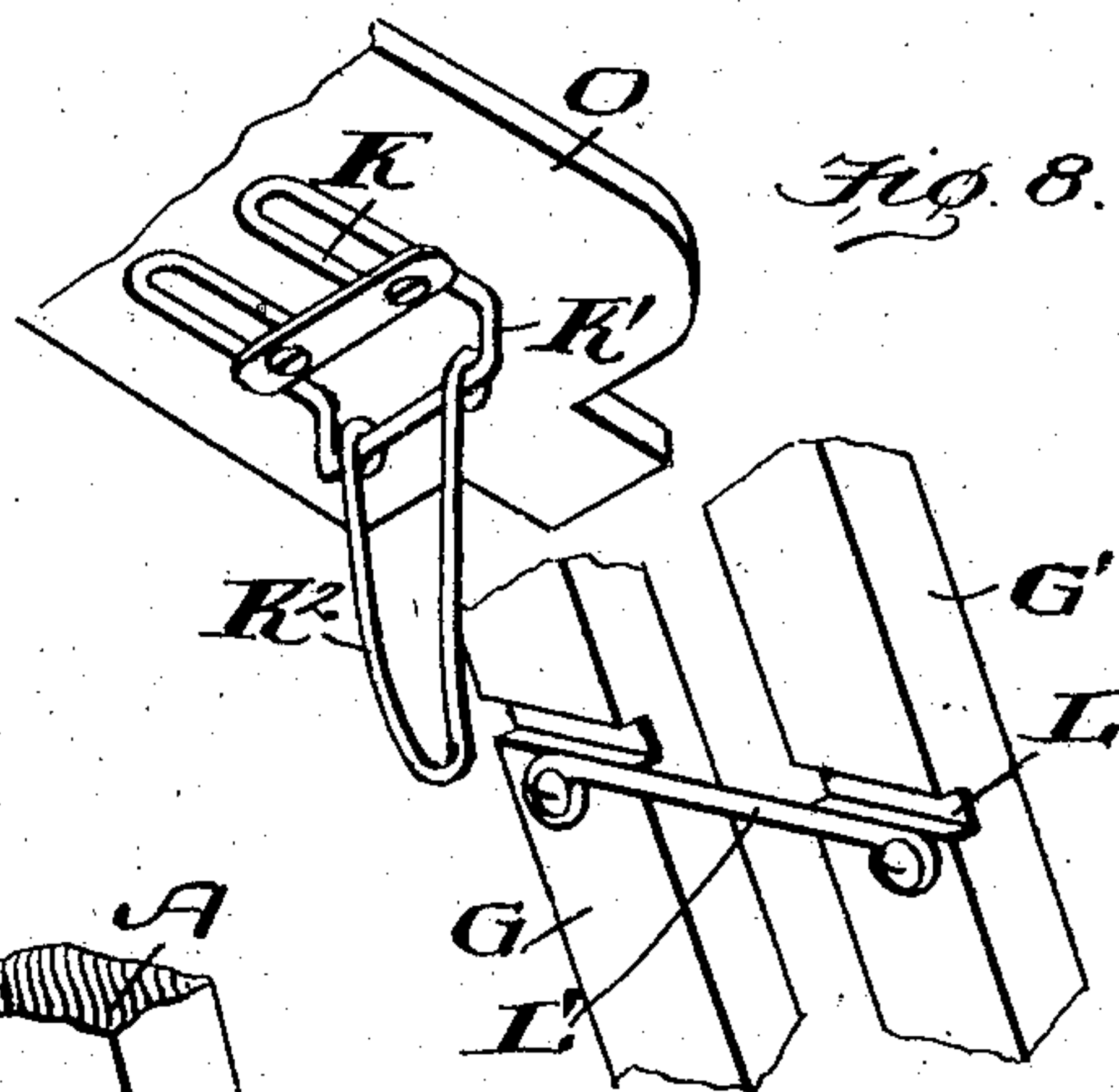


Fig. 9.

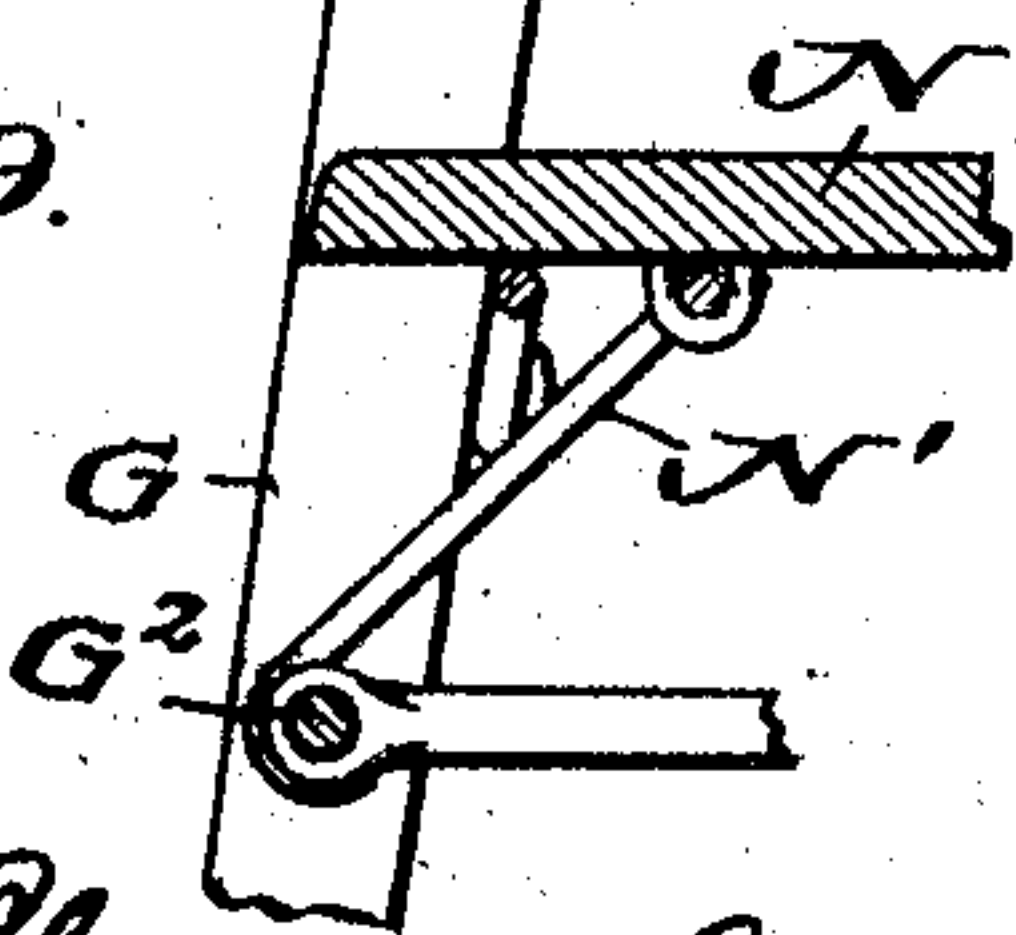
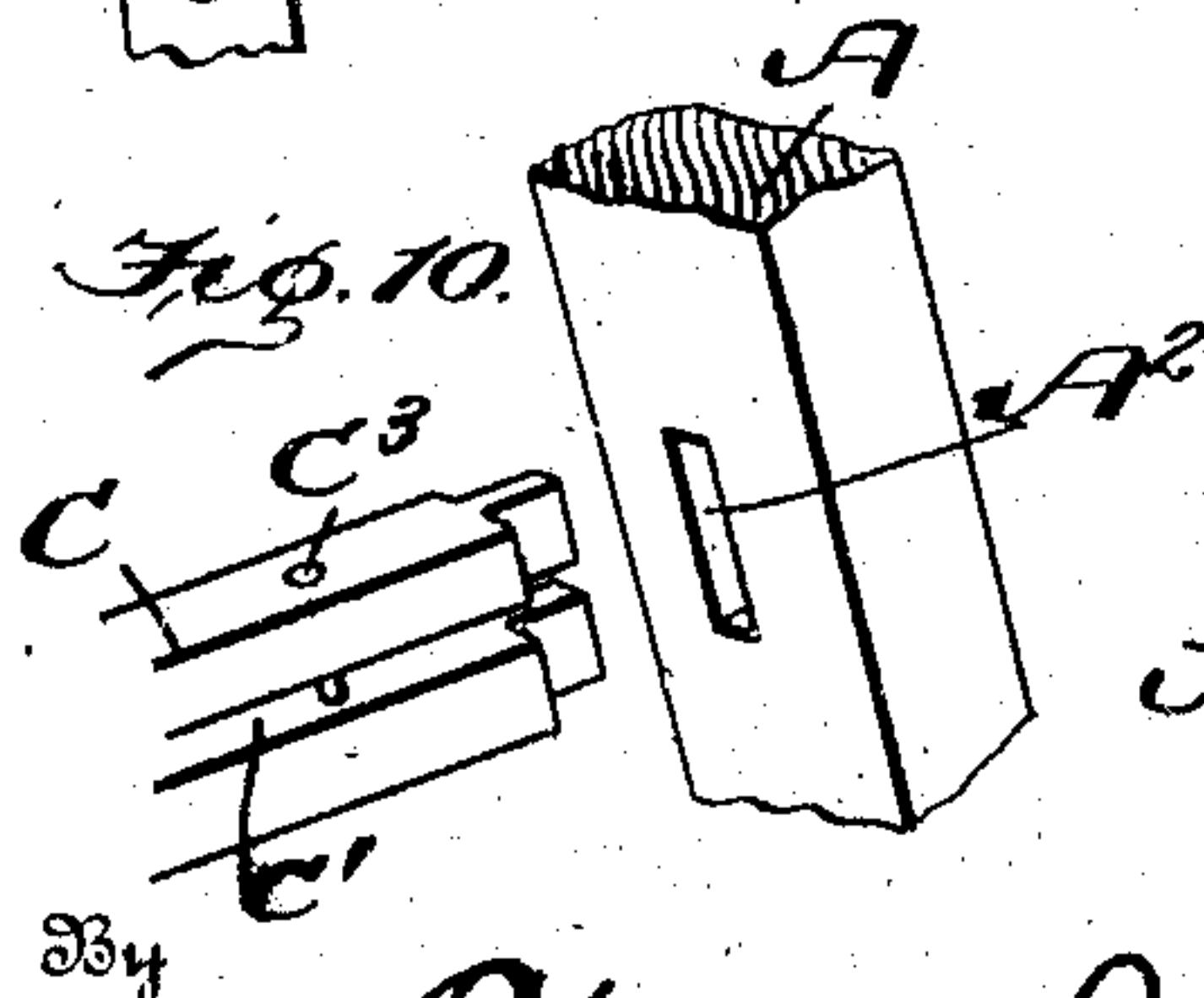


Fig. 10.



Witnesses

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UNITED STATES PATENT OFFICE.

JOHN G. SOERGEL, OF DALLAS, TEXAS.

STEP-LADDER.

SPECIFICATION forming part of Letters Patent No. 791,509, dated June 6, 1905.

Application filed December 12, 1903. Serial No. 184,944.

To all whom it may concern:

Be it known that I, JOHN G. SOERGEL, a citizen of the United States, residing at Dallas, in the county of Dallas and State of Texas, have invented a new and useful Step-Ladder, of which the following is a specification.

My invention is an improvement in knock-down step-ladders, my object being to provide light fastening means by which a ladder can be held together, so that when set up for use it will be firm, strong, and durable and yet not be excessively heavy.

A still further object of my invention is to provide a step-ladder that can be easily and quickly taken apart for shipment or storage, no tool other than an ordinary nail or the like for turning the screw-eyes being required.

I am aware that ladders of a knockdown type have been heretofore constructed; but these ladders have been defective in that when set up they were unsteady or "shaky" for lack of sufficient bracing or if firmly braced were unwieldly and heavy, owing to the weight and cumbrous nature of the bracing. In the construction of my ladder I have endeavored to overcome these faults by a light but firm method of binding the various parts together.

My invention consists in the novel features of construction and combination of parts described hereinafter, particularly pointed out in the claims, and shown in the accompanying drawings, in which—

Figure 1 is a perspective view of my ladder in position for use. Fig. 2 is a side elevation of the ladder. Fig. 3 is a rear view showing the ladder in elevation. Fig. 4 is a vertical section taken through the steps and rear rounds of the ladder. Fig. 5 is a perspective view of the under side of the top step of the ladder. Fig. 6 is a detail view showing the means for connecting a rear round or brace-bar to one of the side members. Fig. 7 is a detail view of construction, the top step being shown in longitudinal section. Fig. 8 is a detail perspective view showing the manner in which the steps are connected to the side members, the step being shown detached. Fig. 9 is a detail view showing the manner of connecting the bottom step to the side members, a portion of the step being shown in

section. Fig. 10 is a view showing the means of connecting the lower rear round to the side members.

In the construction of my ladder I employ two pivotally-connected sections, the front section carrying the usual steps and the rear section serving as a support for the front or step section. The rear section comprises the side members A, longitudinally slotted at A' adjacent their upper ends. This rear section also carries rounds or brace-bars connecting the side members A, the sides being mortised, as at A², Fig. 10, to receive reduced end portions of the rounds. These rounds in a ladder of ordinary size are two in number, and between them the side members carry metal plates B, which are bent back upon themselves at each end to form loops or eyes. A hook member B' is also carried by each plate and arranged between and engaging these hook members is a turnbuckle B² of the usual construction. The lower round C is longitudinally slotted at each end, as shown at C'. An elongated metal loop C² has one end in engagement with the lower eye of the plate B and the other end slides in the slot C', being held in the slot by a pin C³, arranged transversely through the round. One of these loops is arranged adjacent each end of the round and connects it to the side members, the slots allowing limited movement of the round when out of engagement with the mortise A², in which the reduced ends of the round fit. The upper round D is also reduced at the ends, the reduced portions fitting in suitable mortises cut in the inner faces of the side members, and it is pivotally connected to one of the side members by a metal loop or band, which is pivoted at its ends to the side member and which encircles the round, passing through suitable eyes formed on its under side. This band D' prevents the round D from becoming entirely detached from the rear section when the reduced end portions are out of engagement with the notches, as shown in Fig. 6. Diagonally-arranged brace-bars E, preferably formed of a heavy wire, are pivoted at their upper ends to the rear side of the rear section and are bent at their lower ends to engage the upper loops or eyes of the

plates B and where they cross the round D they fit in suitable grooves or notches E'. Sockets E² are formed in the side members in which the bent ends of the rods E fit when detached from the loops of the plate B. The rear section is not connected directly to the front section; but at its upper end each side member A is pivoted between the rearwardly-extending and parallel arms of a bracket F, the bracket being in the form of a rectangular open frame inclosing the side members of front and rear sections.

The front section comprises the side members G G' and the usual steps. The side members are four in number, being arranged in pairs on each side of the steps, the rear ones being designated G and being parallel to the front ones, G'. The brackets F inclose only the rear members G of the front section. To limit the movement of the two sections with reference to each other, rods H are pivoted at their upper ends to the side members G and their lower ends are bent inward and forward, the inwardly-bent portions sliding in the slots A' of the side members A, the spreading movement of the front and rear sections being limited and regulated by the length of the slot, which will depend on the size of the ladder and the number of steps carried by it. A suitable metal wear-plate H' fits over the side members A and are slotted at H², the slots alining with the slots A'.

In the drawings I have shown a ladder having three steps, though any number may be employed. All the steps excepting the top step have reduced end portions which fit between the side members G and G', the members being firmly connected by bolts or rods G². On the under side of the top step are arranged wire loop-frames J, having depending end portions adapted to be sprung over a rod J', connecting the two members G G' on each side of the ladder and adjacent the top step. The top step also carries a wire loop-frame K adjacent each frame J, and this frame has a depending portion K'. A U-shaped wire member K² has its free ends bent to form eyes which engage the depending portion K' of the frame K. A U-shaped member K³ has its free ends bent around the upper bolt G², and one of these members K³ depends between each pair of the side members of the front section. On the side members G are arranged eye-screws K⁴, adapted to be engaged by the bow portions of the members K³. At their rear ends the rods J' are bent upwardly, as shown in dotted lines in Fig. 2, and project outward through the upper ends of the members G. Suitable sockets are formed in the under side of the top step to receive the projecting end portions. The top step is placed in position by fitting these sockets over the end portions of the rods J'. The members K³ are passed through the members K², respectively, which slide on the members K³, and the members K³

are then brought into engagement with the eyes of the screws K⁴ and the eyes turned transverse to the loops comprising the members K³, thus securely locking the step in position.

The inner faces of the side members forming the front section are notched, as shown at L in Fig. 8, and while the reduced end portion of the step fits between the side members the end portion proper fits in the notches L. A turnbuckle M is arranged between the two pair of side members, its ends being connected, by means of metal or wire loops, to an intermediate bolt G². Adjacent and just below each notch L is arranged a wire or rod L' parallel with the notches and extending from one side member G to the adjacent member G' and forming a support for the reduced end portion of the step. The intermediate step is arranged just above the turnbuckle, and this step N is connected to one pair of the side members G and G' by means of a U-shaped member N', the bow portion of which passes through eyes carried by the under side of the step, and its free ends are bent around the bolt G², to which an end of the turnbuckle M is connected. This means of connecting the step N against complete detachment from the ladder is shown in Fig. 9.

The description given of the fastening means employed in the top step is duplicated in connection with the bottom step O with the exception of the parts J and J', the only difference being that the U-shaped wire member K³, used in connection with the bottom step, is bent around the lower bolt G² instead of the upper bolt, as is the case with the member used with the top step.

On the under side of the top step I secure by suitable screws a name-plate P, covering a portion of the wirework and on which any desired printed matter may appear.

To take the step-ladder down, the front turnbuckle M is loosened, the lower step is unlocked from the left side by turning the eye-screw K⁴, slipping the loop K³ over same, and thus releasing the member K². The top step is then unlocked in the same manner on both sides and lifted clear of the side members. The intermediate steps are released on one side and partially on the opposite side, being held by the loop member N' from complete detachment. In the back the turnbuckle is first loosened, the bars E are unhooked and their ends placed in the sockets E², the lower cross-piece is swung upwardly on the left-hand side and downwardly on the right-hand side, and the round D is allowed to swing downward at one end. The parts may then be tied together in a compact bundle for storage or shipment.

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

1. A step-ladder comprising front and rear

sections, the front section comprising parallel side pieces arranged in pairs, steps detachably carried by the front section, bolts connecting the side pieces of each pair, U-shaped wire members having their free ends bent around the bolts, screw-eyes carried by the front section and adapted to be engaged by the bow portions of the U-shaped members, and U-shaped wire members pivotally carried by the steps and adapted to engage the U-shaped members first mentioned.

2. In a ladder of the kind described comprising front and rear sections, notched side members forming part of the rear section, a round having reduced end portions adapted to engage mortises in the side members, a metal loop pivotally connected at its ends to one of the side members, said loop encircling and engaging the round, a lower round longitudinally slotted at each end, the ends engaging notches in the side members, plates secured to the side members intermediate the rounds and bent at each end to form eyes, loops engaging the lower eyes formed on said plates and the slotted end portions of the lower round,

and brace-bars pivoted at their upper ends to the side members and having their lower ends bent to engage the upper eyes of the plates, substantially as set forth.

3. A ladder of the kind described comprising a front step-section and a rear supporting-section, a step, wire loop-frames arranged on the under side of the step and having depending portions, U-shaped wire members having their ends bent to form eyes, said eyes engaging the depending portions of the frames, bolts carried by the side members of the front section transversely to the steps, U-shaped members having their free ends bent around the bolts, the wire members depending from the frames being adapted to slide in the members connected to the bolts, and screw-eyes adapted to be engaged by the wire members connected to the bolts, said eyes being carried by the side members of the front section, as and for the purpose set forth.

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Witnesses:

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