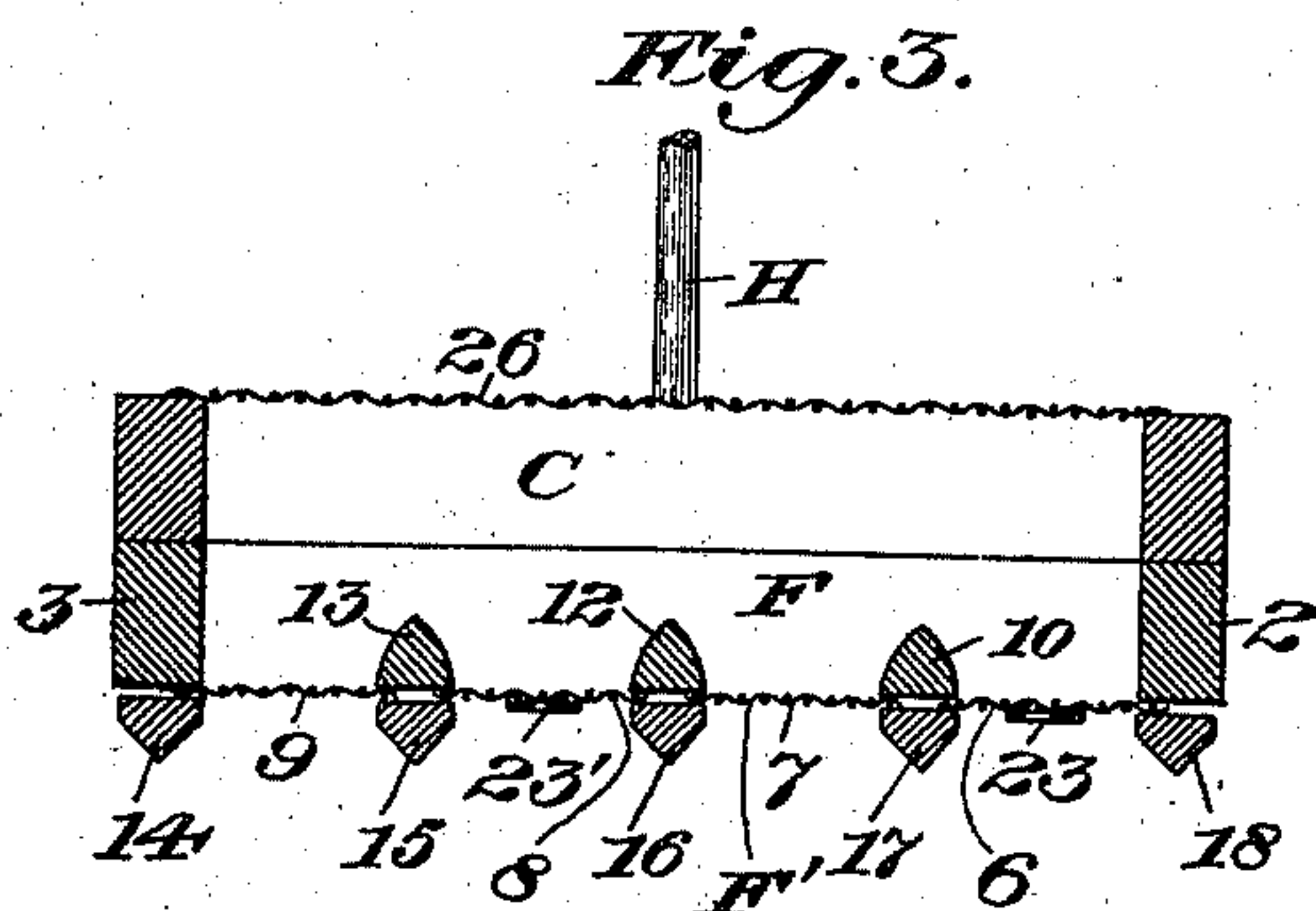
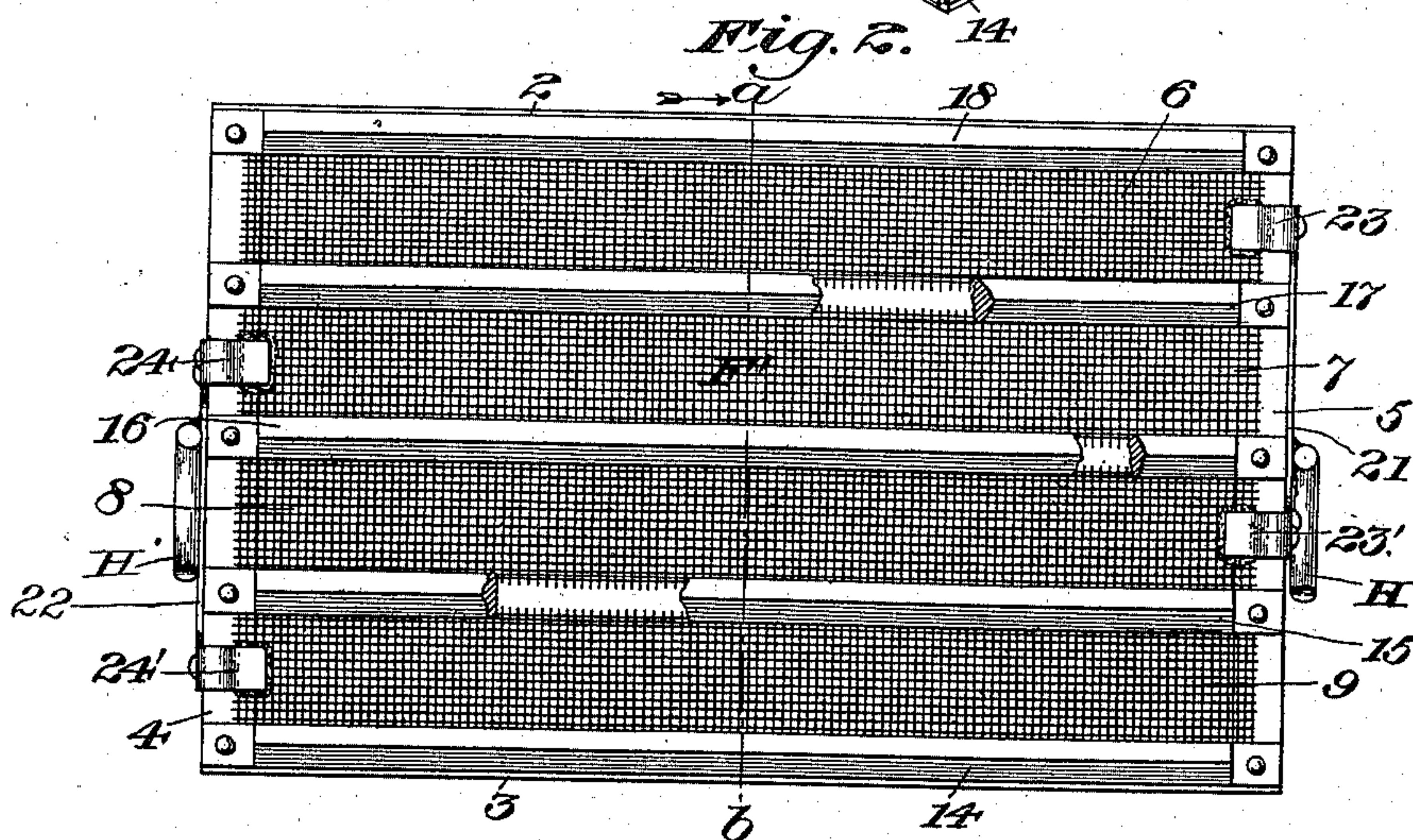
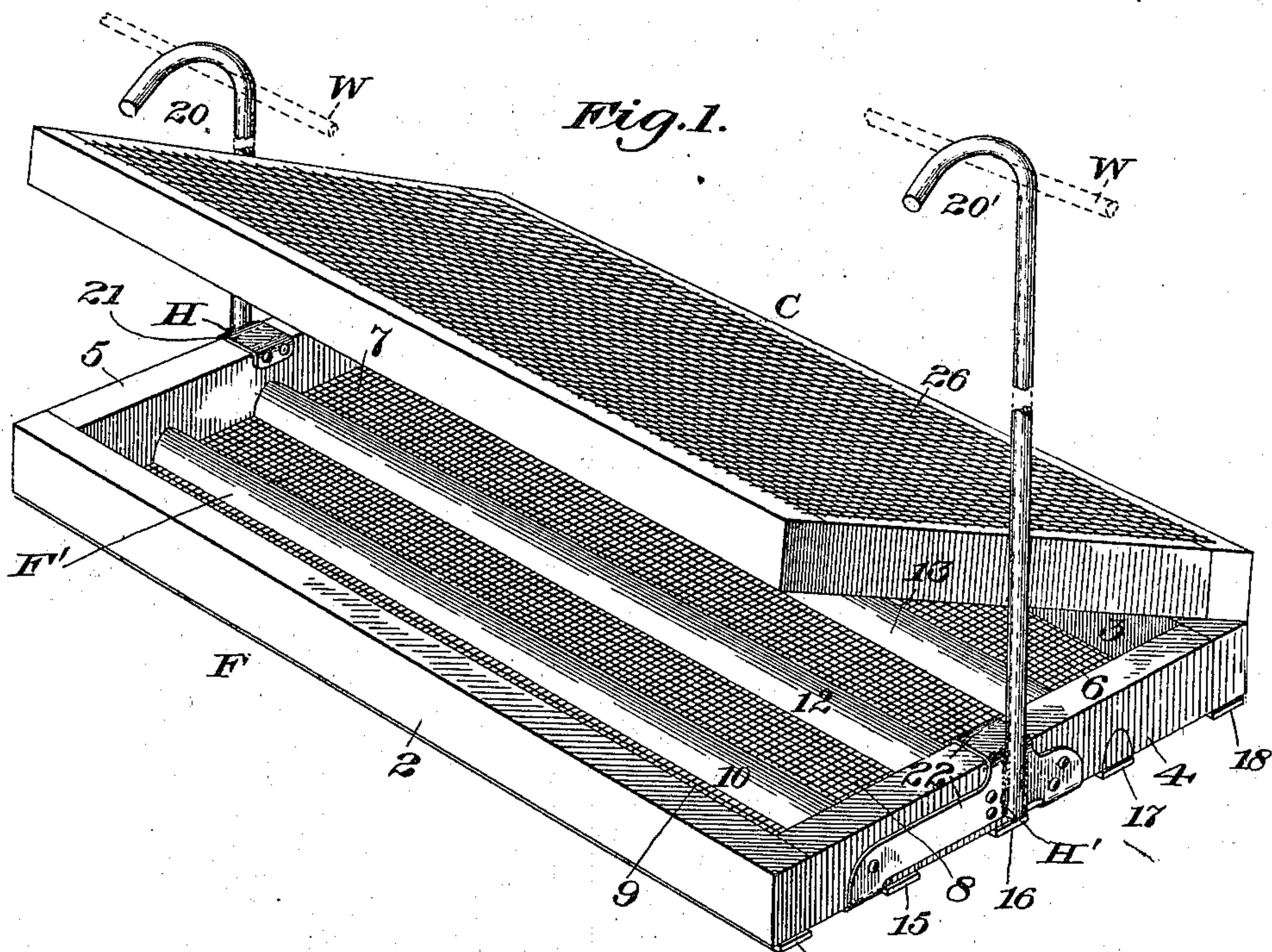


(No Model.)

R. J. MARKS.
ELECTROPLATING APPARATUS.

No. 574,038.

Patented Dec. 29, 1896.



Witnesses;
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UNITED STATES PATENT OFFICE.

RICHARD J. MARKS, OF HARTFORD, CONNECTICUT, ASSIGNOR OF ONE-HALF TO WILLIAM P. O'TOOLE, OF SAME PLACE.

ELECTROPLATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 574,038, dated December 29, 1896.

Application filed October 12, 1896. Serial No. 608,545. (No model.)

To all whom it may concern:

Be it known that I, RICHARD J. MARKS, a citizen of the United States, residing in Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Electroplating Apparatus, of which the following is a specification.

This invention relates to that class of electroplating apparatus generally known as a "work-holder," which work-holder is adapted for use in connection with an electroplating-bath for holding the work during the process of electroplating.

The object of the invention is to furnish a simple and improved work-holder adapted for use with electroplating-baths and embodying means whereby a multiplicity of articles may be electroplated and may be supported therein, and whereby a uniform electroplating treatment of the several articles contained therein will be positively insured.

To this end my invention consists in part in the embodiment, in a work-holder of the class specified, of a suitable non-conductive frame, a series of relatively-insulated permeable conductive floor-sections secured to said non-conductive frame, and two conducting-hangers located at opposite ends of the frame, respectively, and one of which is conductively connected with alternately-conductive sections at one end of said frame, and the other of which is conductively connected with the intermediate alternating conductive sections at the opposite end of the frame.

It further consists in the peculiar construction and organization of the several parts of the work-holder, substantially as hereinafter described, and more particularly pointed out in the claims.

In the drawings accompanying and forming part of this specification, Figure 1 is a perspective of a work-holder of the class specified embodying my present improvements, said figure showing the work-holder furnished with a permeable cover. Fig. 2 is an under side view of the work-holder, parts thereof being broken away; and Fig. 3 is a cross-sectional view of the work-holder, taken in dotted line *a a*, Fig. 2.

Similar characters designate like parts in all the figures of the drawings.

The work-holder in the preferred form thereof shown in the drawings comprises in part a suitable non-conductive open frame, (designated in a general way by F,) a suitable permeable bottom or bed (designated by F') embodying a series of relatively-insulated conductive sections secured to the framework, and two conducting-hangers (designated by H and H', respectively) secured to opposite ends of the frame, and one of which hangers is connected by the conductive strips to alternating conductive sections of the bottom or bed at one end of the frame, and the other of which is secured to intermediate alternating sections in a similar manner at the opposite ends of the frame, as will be hereinafter more fully described.

In the form thereof shown in the drawings the framework F, which will preferably be constructed of wood or any suitable non-conducting material, is in the nature of a relatively shallow, oblong, open frame comprising the two parallel side pieces 2 and 3 and the two end pieces 4 and 5, secured to said side pieces.

The floor or bed F' comprises, in the preferred form thereof shown in the drawings, a series of elongated or relatively narrow permeable conductive strips, (herein shown as four in number and designated by 6, 7, 8, and 9, respectively,) preferably constructed of wire-netting and secured at opposite ends to the end pieces 4 and 5 of the framework and insulated from one another by non-conductive strips 10, 12, and 13, respectively, which are interposed between the adjacent side edges of the successively-adjacent conductive strips 6, 7, 8, and 9, and which non-conductive strips 10, 12, and 13 are shown located in parallelism and are secured at their opposite ends to the end pieces 4 and 5 of the non-conductive frame F.

The adjacent edges of the conductive strips 6, 7, 8, and 9 are relatively separated and are preferably clamped against the under sides of the insulating-strips 10, 12, and 13 and against the under sides of the two side rails 2 and 3 of the frame, preferably by means of clamping-cleats 14, 15, 16, 17, and 18, secured at their outer ends to the end pieces 4 and 5 of the framework below the end rails 2 and 3.

and the insulating-strips 10, 12, and 13, respectively, as will be understood by reference to the figures of the drawings.

The insulating-strips 10, 12, and 13, which will preferably be convex at their upper faces, also constitute dividing-partitions for separating the interior of the work-holder into a series of relatively-separated compartments, each compartment of which constitutes one section of the bottom of the work-holder and is adapted for receiving a number of articles to be plated.

As will be understood by reference to the drawings, the conducting-hangers H and H' are shown formed of wires bent at their upper ends, as shown at 20 and 20', to form hooks whereby the work-holder may be suspended from the negative terminal wire, (shown at W in dotted lines, Fig. 1,) said hangers being disposed vertically with relation to the plane of the bottom of the work-holder and being connected with the end pieces 4 and 5 of the framework near the middle portion thereof, preferably by means of straps 21 and 22, which straps are secured to the outer faces of the end pieces and have inward or lateral projections 23 and 23' and 24 and 24'. The projections 23 and 23' of the hanger H are shown in direct connection with the conductive sections 6 and 8, and the projections 24 and 24' of the hanger H' are shown in direct connection with the conductive sections 7 and 9. Thus it will be seen that when the frame is hung upon the negative terminal wire of the battery, dynamo, or other current-producer and submerged in the electroplating-bath the current from the positive pole of the battery or dynamo (not shown) will pass through the solution to the insulated ends of the several conductive sections and through said sections to the conductive hangers connected with the respective sections, different portions of the current entering at one end of one section and at the opposite end of the other section and passing each other in opposite directions to their respective conducting-hangers, thereby insuring the travel of the current over the entire areas of the several conductive sections and preventing short-circuiting, as frequently occurs with metallic work-holders of ordinary construction.

For the purpose of facilitating or shaking up the contents of the work-holder to provide means whereby said work-holder may be inverted I have shown in connection with the work-holder proper a cover, which is designated in a general way by C and which in

the form illustrated comprises an open frame similar to the open framework 25 of the work-holder proper, and which framework is covered by a wire-netting 26.

Having described my invention, I claim—

1. A work-holder of the class specified, comprising two elongated parallel conductive sections; a non-conductive stop interposed between adjacent edges and insulating said conductive sections; and a conducting-hanger in connection with each section.

2. A work-holder of the class specified, comprising an opening-frame of non-conductive material, having a floor composed of a series of elongated parallel conductive and non-conductive stops alternating with each other and conductive hangers fixed at opposite ends of said frame and one of said hangers being conductively connected with alternating conductive sections at one end of said frame and the other hanger being conductively connected to alternating conductive sections at the opposite end of said frame.

3. A work-holder comprising two adjacent relatively-insulated conductive sections and two conducting-hangers, one of which is connected to one section at one end and the other of which is connected to the adjacent section at the opposite end.

4. A work-holder of the class specified, comprising a suitable non-conductive frame; a series of relatively-insulated permeable conductive floor-sections secured to said non-conductive frame; and conducting-hangers, one of which is conductively connected with alternating conductive sections at one end of the frame and another of which is conductively connected with intermediate alternating conductive sections at the opposite end of the frame.

5. A work-holder of the class specified, comprising a suitable non-conductive frame; a series of relatively-insulated permeable conductive floor-sections secured to said non-conductive frame; conducting-hangers, one of which is conductively connected with alternating conductive sections at one end of the frame and another of which is conductively connected with intermediate alternating conductive sections at the opposite end of the frame; and a permeable cover in connection with the section-frame.

RICHARD J. MARKS.

Witnesses:

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