

(No Model.)

3 Sheets—Sheet 1.

V. L. OURDAN & C. A. KOLB.
PANTOGRAPH.

No. 435,242.

Patented Aug. 26, 1890.

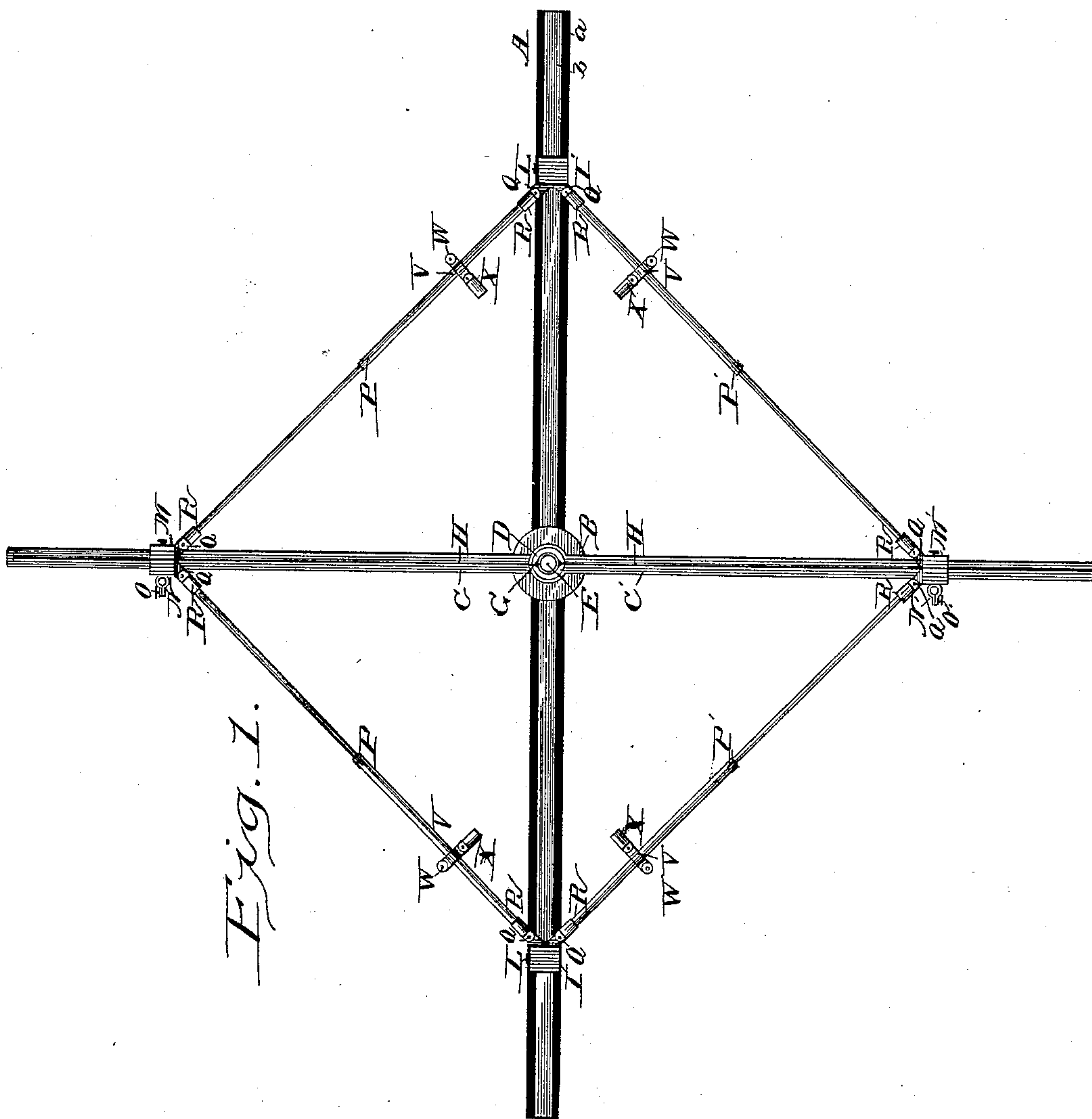


Fig. 1.

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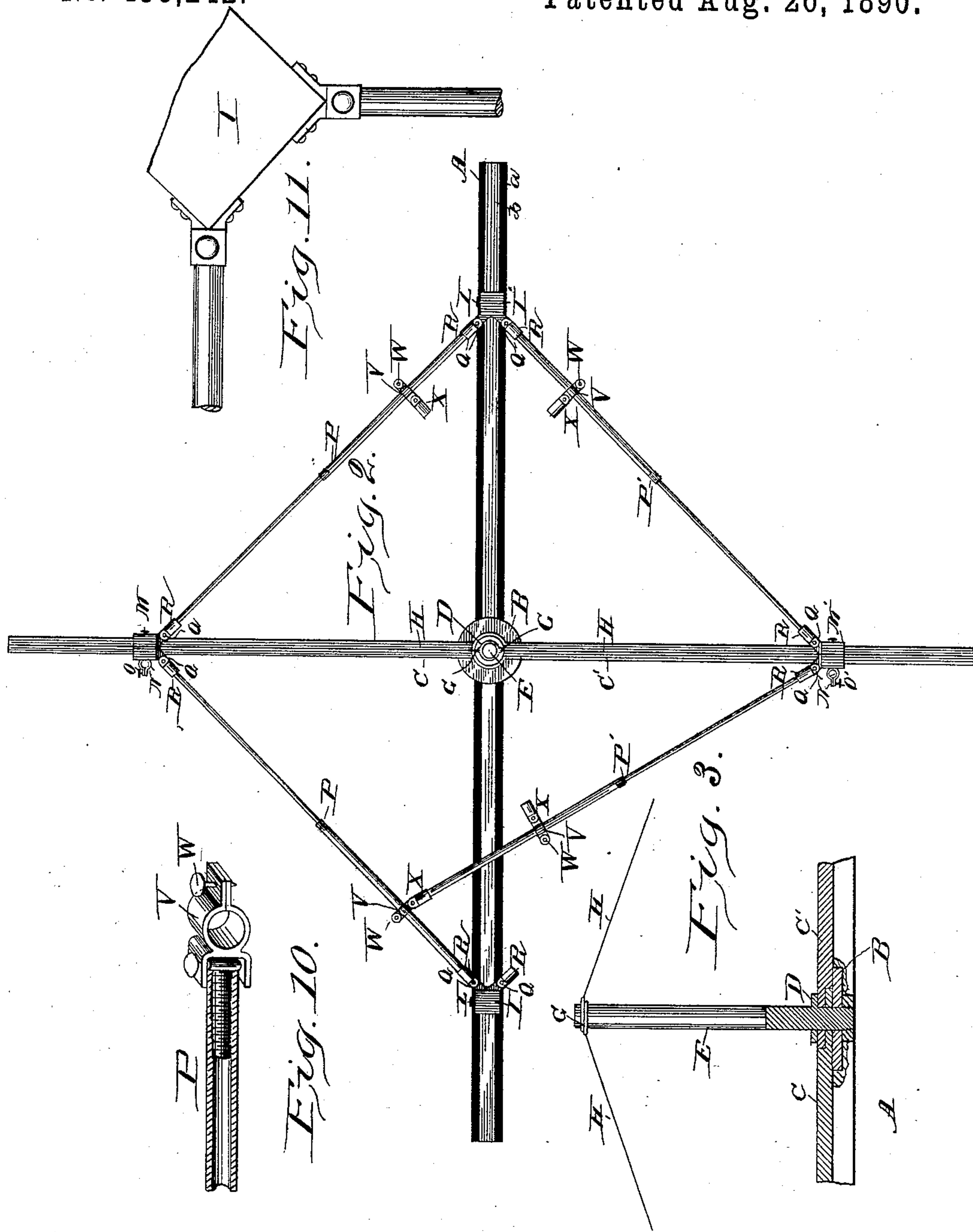
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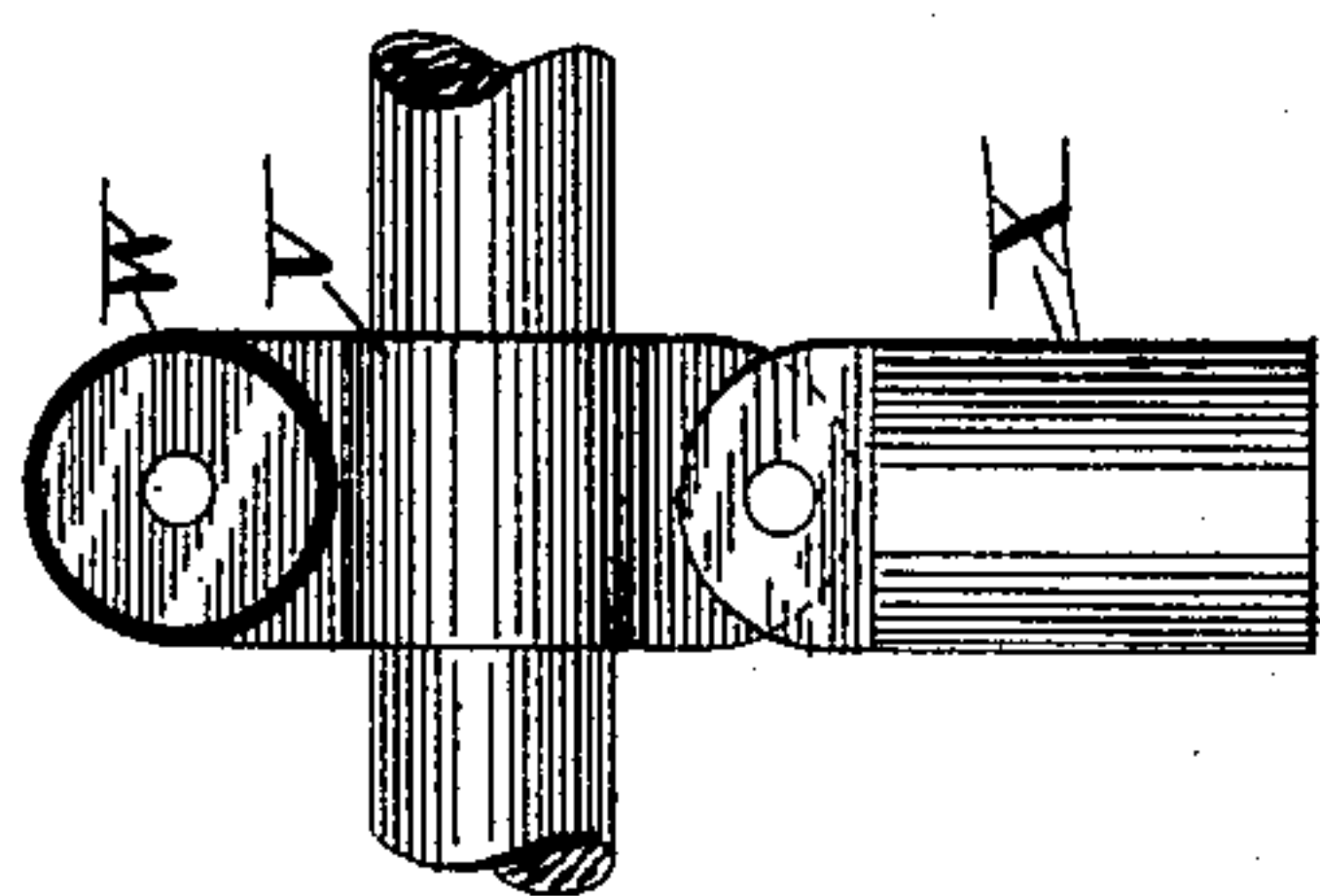
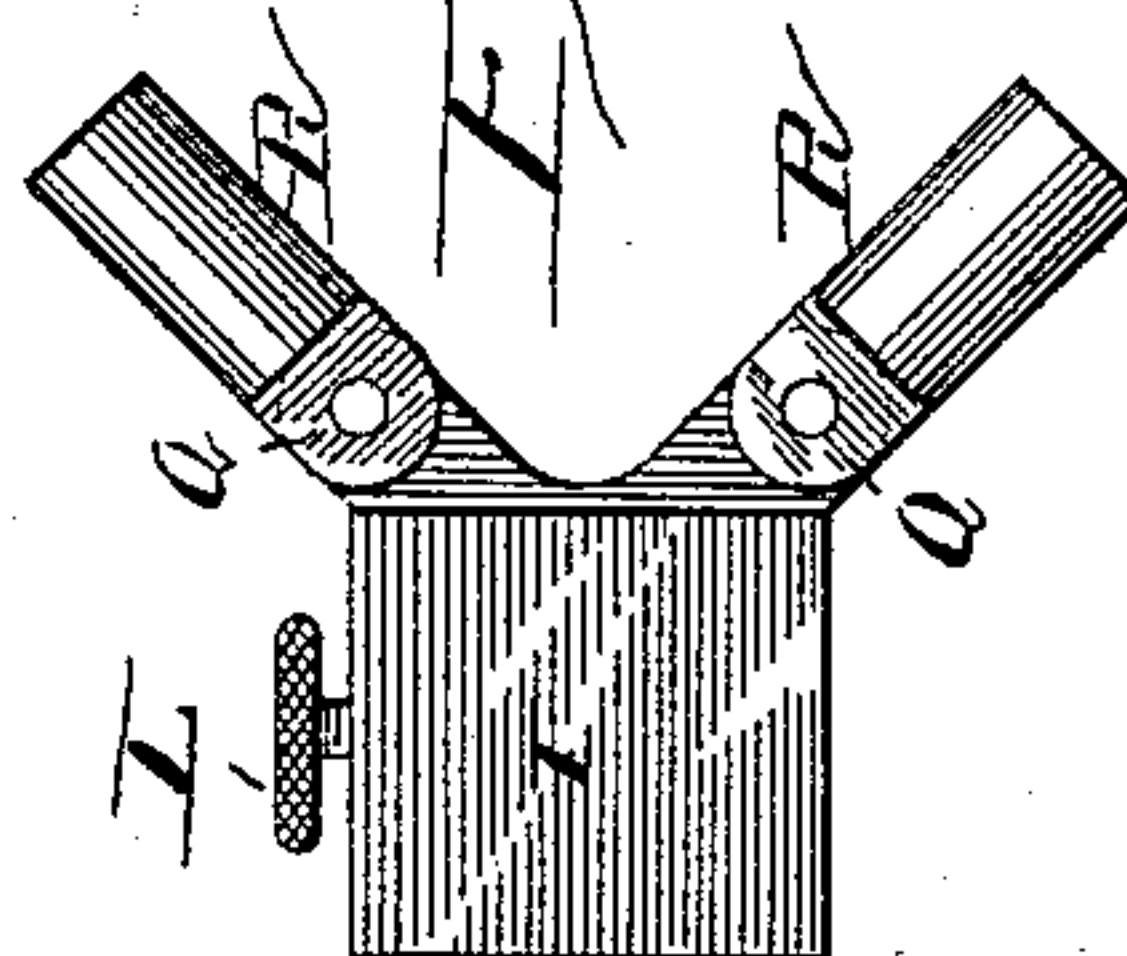
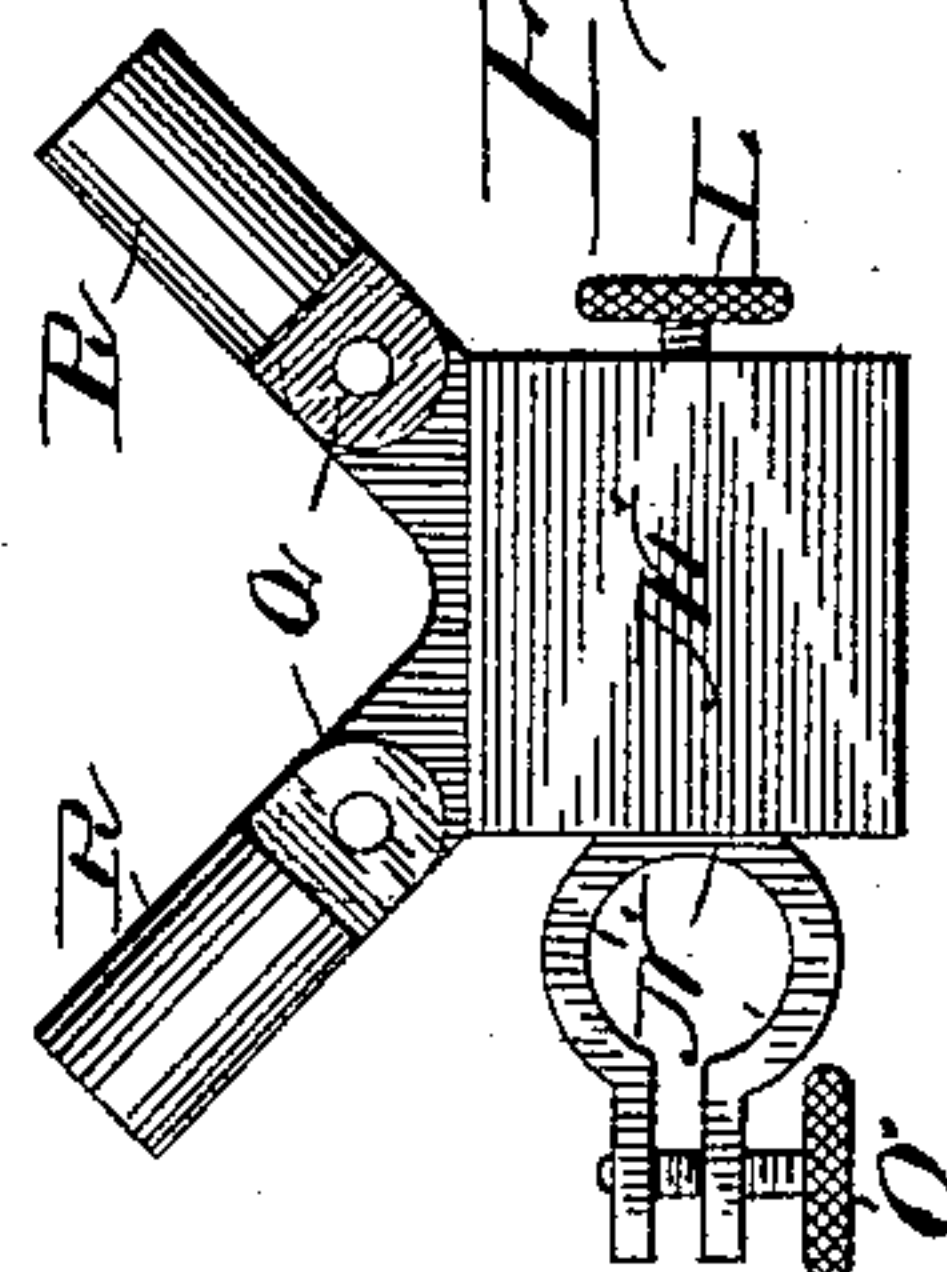
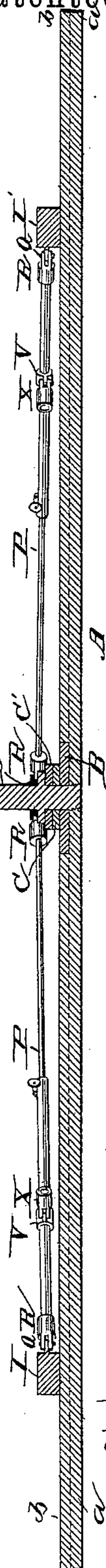
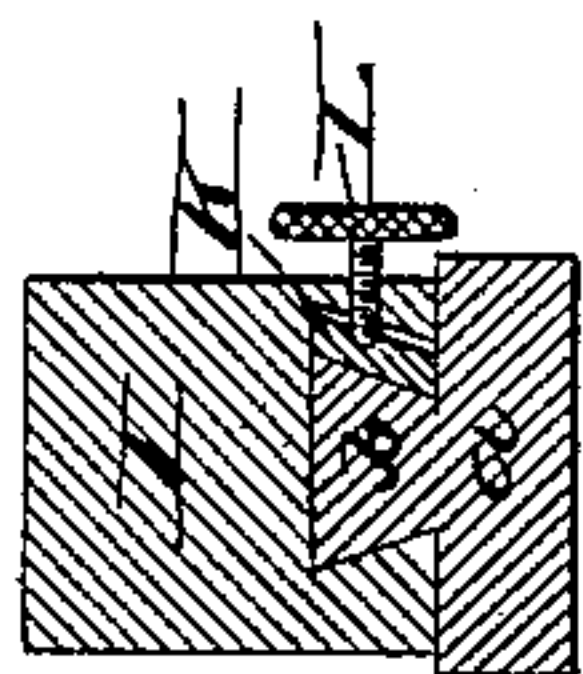
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PANTOGRAPH.

SPECIFICATION forming part of Letters Patent No. 435,242, dated August 26, 1890.

Application filed February 20, 1890. Serial No. 341,137. (No model.)

To all whom it may concern:

Be it known that we, VINCENT L. OURDAN and CHARLES A. KOLB, citizens of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Pantographs, of which the following is a specification, reference being had to the accompanying drawings.

The object of our invention is to produce a pantograph adapted to work easily in every direction with great rigidity and firmness of movement, so as to reproduce with perfect accuracy and smoothness any pattern which it is set to copy.

Heretofore in pantographs the construction attainable under the old forms was such as to prevent their employment in the fine arts—such, for instance, as engraving, where a mathematically-correct copy is required.

Our invention, while it is adapted to be used for all purposes, is by its peculiar construction especially designed for use in the art of exact engraving on hard surfaces, such as copper and the like. Heretofore it has been necessary to have such engraving executed by hand through the most skilled workmen. In chart or map engraving it has also been necessary to insure that perfect accuracy which is in such work absolutely essential to take repeated measurements in order to verify the location of each point with respect to every other. Besides this, the process of producing an engraved plate by hand consists of a number of steps, all of which must be performed with equal care and skill. Consequently the cost of a plate has been very great and the time consumed in preparing it has been considerable. By the use of our invention we can prepare from maps or other patterns a perfect reproduction of the outlines. Our machine being absolutely accurate in its movement, it is not necessary to verify its work by measurement if the pattern upon which it was executed has first been ascertained to be correct. Besides we dispense with all the steps necessary to the producing of an engraved plate except the actual cutting upon the metal itself. The figure produced by our machine upon the plate is the exact negative of the

pattern, so that the entire plate is engraved by one operation. It may be necessary to smooth up the work a little; but that is always necessary according to the old method, and the amount of it required is not so great where our machines are used as where the work is done altogether by hand. From the simplifying of the process and dispensing with the verification heretofore required the cost of engraving may be very largely reduced, and that without detracting in the least from the character of the work.

In the accompanying drawings, Figure 1 is a plan view of our pantograph, showing the arms of equal lengths. Fig. 2 is a plan view showing one of the arms detached from the block and secured to the arm adjacent to it. Fig. 3 is a detached view, partly in section, showing the arrangement of the parts pivoted to the main track. Fig. 4 is a central vertical section of Fig. 1. Fig. 5 is a top view of one of the blocks which travel on the side track, and Fig. 6 one of the blocks which travel on the main tracks. Fig. 7 is a detached view of the collar and hinged socket adapted to move upon one of the connecting-rods. Fig. 8 is a detached view of one of the connecting-rods. Fig. 9 is a section detached of one of the blocks, showing the gib for regulating the pressure upon the track. Fig. 10 shows a desirable form of hinge for securing one of the connecting-rods to the other, and Fig. 11 the same hinge adapted to be secured to one corner of one of the blocks.

Referring to the letters upon the drawings, A indicates a track, which is preferably made of metal, and is adapted to be firmly secured by clamps or brackets, or any well-known and convenient means, to an ordinary table adapted to have the pattern and the plate to be engraved laid upon it.

In the drawings the track is shown as consisting of a base *a* and integral therewith a rib *b* upon it, the latter being of wedge or dovetail form in cross-section; but any form of track may be used, some shapes, on account of their cheapness and lightness, being better adapted to certain purposes than others.

Upon the center of the track A is firmly

secured a disk B, which serves as a bearing for the lateral track-arms CC', pivoted above it.

D indicates a flange upon the upright rod E, that is adapted to pivot the lateral arms together and hold them in place. It is provided at its upper end with pivoted guys G, and may be screw-threaded on its lower end to be screwed into an internally-screw-threaded hole in the track A, or it may be passed through the track and secured on the other side by a countersunk nut or the like. Any convenient means for uniting these parts may be employed.

H indicates stays, which are preferably made of wire, and are connected at one end with the guys G and at the other end with the outer ends of the lateral arms CC' to support them.

I I' indicate blocks fitted to the rib b, and adapted to travel freely upon the opposite ends of the track A. These blocks are provided with gibs K and adjustment-screws L for regulating their pressure upon the track on which they move. M M' indicate similar blocks provided with similar gibs and set-screws, that are adapted to move upon the lateral arms CC'. The form of blocks shown in the drawings is adopted in order to correspond with the track upon which it travels; but the blocks should always conform with the shapes of their tracks, which may be varied, as above indicated, in many ways.

Upon each of the blocks M and M' is provided a split collar N N' and a thumb-screw O O', respectively, for increasing or diminishing the size of its internal diameter. It is immaterial which block carries the tool and which the stylus. They may be interchanged at will.

The tool adapted to be borne for engraving may, if desired, consist of a rapidly-revolving incised point. This instrument is well known in the art of engraving, and, as it does not enter into our invention, needs no further description.

Between the blocks I I' and M M', respectively, are connecting-rods P P'. The ends of these rods must be directly or indirectly hinged to opposite blocks, so as to allow the blocks to move freely upon their tracks; but the rods may be made of any convenient shape or size. In the drawings is illustrated a suitable form of connecting-rod.

On each of the inside corners of the blocks I I' and M M' are borne, upon hinges of any ordinary kind Q, internally-screw-threaded sockets R, adapted to receive the externally screw-threaded ends of the rods P P'. It is necessary that the rods shall be adjustable in length, and we find that the construction shown in the drawings (see Fig. 8) is a convenient means of accomplishing this purpose. The rods are divided in two parts. The sections of each rod are made tubular and one larger than the other, so that the smaller may telescope into it. In the free end of the larger tube we provide a slit S and lugs T,

one of which is internally screw-threaded to receive the thumb-screw U, so that the parts of the end of the large section of the rod may be clamped together upon the smaller section and hold the two sections together.

Upon each of the rods P P' we provide a split collar V, adapted to be clamped upon its rod by the thumb-screw W. These collars are provided with hinged internally-screw-threaded sockets X, corresponding to the sockets borne upon the blocks. These sockets are adapted to carry the ends of the rods P P' adjacent to them, respectively, when they are disengaged from the blocks in the manner and for the purpose that will be hereinafter explained.

The operation of our invention is as follows: Suppose the rods P P' to be adjusted to equal lengths and secured at their ends to the blocks I I' and M M'. Then by operating the block M, which we will assume carries the stylus, and causing the stylus to follow a pattern, the motion of that block to or from the center will cause a movement in the contrary direction of the block M'. This movement is necessary to produce the negative plate, because a change of direction in a line toward or from the central perpendicular or north and south line must produce a contrary change of direction in the line upon the plate; but all changes of direction of lines with respect to a central horizontal or east and west line remain the same in the negative as in the positive. Therefore a movement of the block M parallel to the north and south line occasions a corresponding travel of the block M' in the same direction.

The relative movements of the stylus and tool, as just explained, are the result of the equality in the lengths of the rods P P'. By equally diminishing the lengths of the rods secured to the block M, for instance, the movement of the stylus over a given space will produce a movement of the tool over a smaller space. Increasing the relative lengths of those arms will produce the contrary effect. By disconnecting two of the rods from the blocks and connecting them with another rod through the collar V on it many other changes in the rods of almost endless variety may be produced, depending upon the relative lengths of the rods and their positions with respect to one another.

This feature of our invention is adapted to be used to advantage in cutting plates for illustrations for newspapers or the like—such, for instance, as caricatures, &c.—as the outline of the tracing can be grotesquely distorted through the ordinary manipulation of the machine by simply changing the relations and lengths of the arms P P'.

What we claim is—

1. The combination, with a fixed track and sliding blocks I I', adapted to travel thereon, of lateral track-arms pivoted to the fixed track, sliding blocks M M' upon said arms, and pivoted connecting-rods between the

blocks I I' and M M', respectively, substantially as set forth.

2. The combination, with a fixed block and sliding blocks I I', adapted to travel thereon, 5 of lateral track-arms pivoted to the fixed track, sliding blocks M M' upon said arms, and pivoted adjustable connecting-rods between the blocks I I' and M M', respectively, substantially as set forth.

10 3. The combination, with a fixed block and sliding blocks I I', adapted to travel thereon, of lateral track-arms pivoted to the fixed track, sliding blocks M M' upon said arms, pivoted connecting-rods between the blocks

I I' and M M', respectively, and hinged sock- 15
ets adjustably borne upon the connecting-
rods, each adapted to receive one end of one
of the connecting-rods when disengaged from
its block, substantially as and for the purpose
set forth. 20

In testimony of all which we have hereunto
subscribed our names.

VINCENT L. OURDAN.
CHARLES A. KOLB.

Witnesses:

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THOS. S. HOPKINS.