

(No Model.)

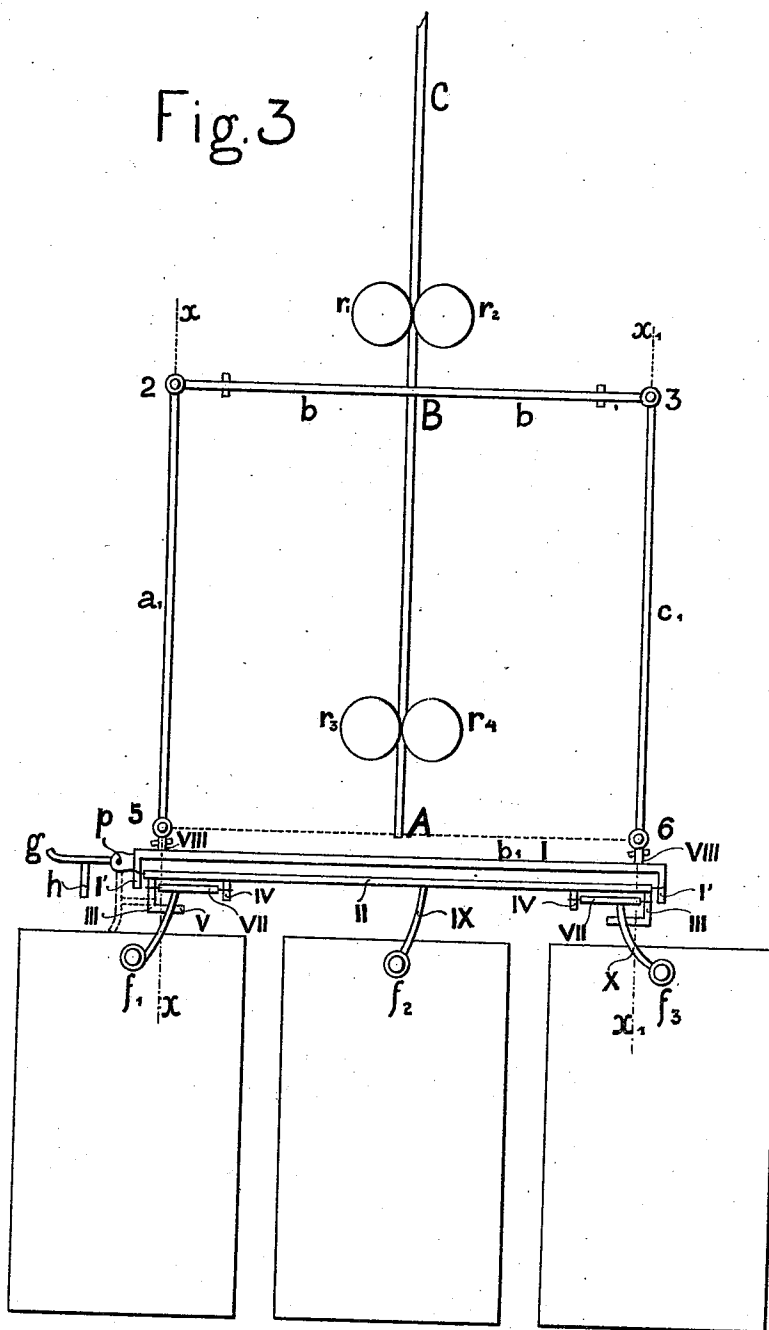
2 Sheets—Sheet 2.

L. KLERITJ.
POLYPANTOGRAPH.

No. 512,719.

Patented Jan. 16, 1894.

Fig. 3



Witnesses
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UNITED STATES PATENT OFFICE.

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POLYPANTOGRAPH.

SPECIFICATION forming part of Letters Patent No. 512,719, dated January 16, 1894.

Application filed September 13, 1892. Serial No. 445,809. (No model.)

To all whom it may concern:

Be it known that I, LJUBOMIR KLERITJ, a subject of the King of Servia, residing in the city of Belgrade, in the Province of Belgrade, in the Kingdom of Servia, have invented certain new and useful Improvements in Polypantographs, of which the following is a specification.

This invention relates to a pantograph apparatus by which two, three or more writings or drawings can be simultaneously produced or copied.

A pantograph according to this invention is illustrated diagrammatically in two modifications in Figures 1 to 3 of the accompanying drawings.

Fig. 1 is a plan view of a polypantograph with two articulated parallelograms with a stationary side. Fig. 2 illustrates a polypantograph with one articulated parallelogram and with a guiding-rod. Fig. 3 is a plan-view of the same construction as Fig. 2, but more detailed. Fig. 4 represents in a larger scale a plan-view of the device carrying the writing appliances. Fig. 5 is a longitudinal section of a fountain-pen.

In the construction shown in Fig. 1 an articulated parallelogram carrying the writing or drawing appliances is jointed to a second parallelogram the one side of which is supposed to be stationary.

In Figs. 2 and 3 is shown another construction, in which the one side of the parallelogram is rigidly connected to a rod sliding between guiding rollers. The latter construction is shown more in detail in Fig. 4.

The pantograph shown in Fig. 1 consists of two articulated parallelograms $abcd$ and $a'b'c'b$. The coupling side b may be supposed to slide along the circumferences of the circles xx' described by the radii a and c . As a' is equal to c' and b to b' , the side b' in every position of the parallelogram is parallel to d , which is held stationary by the points 1 and 4, and the turning on the pivots 2 and 3 of the side b determines that points on the side b' must trace drawings or writings all exactly alike. If I therefore attach to the side b' three pens $f'f^2f^3$, or a greater number of these and write with one of them, all the other pens will write the same. As this result is

independent of the length of the sides a and c , which might be infinite so that the circles x and x' of Fig. 1 may be considered two parallel straight lines x and x' , as shown in Fig. 2, passing through the points 2 and 3, at right angles to the line yy and consequently also to the side b of the second parallelogram. If I compel the points 2 and 3 to slide along the parallels x and x' the distance of which from 2 to 3 is same as from 5 to 6, and if I turn the sides a' and c' equally about the pivots 2 and 3 then the side b' of the parallelogram will be always parallel to the side b so that writing or drawing appliances attached to points of the side b' must describe similar letters or figures.

The guiding of the points 2 and 3 along the parallels x and x' is preferably effected by a rod ABC , parallel to x and x' and rigidly connected at B to the side b sliding between two pairs of stationary rollers r^1r^2 and r^3r^4 , Fig. 2. The apparatus represented in Fig. 2 is thus a special construction of that shown in Fig. 1.

Fig. 3 illustrates diagrammatically the arrangement and connection of the writing appliances $f'f^2f^3$ of the apparatus shown in Fig. 2. Fig. 4 shows the details of the arrangement of the pen f' , and its adjustment. The side b' consists of a straight and solid or hollow rod I provided with projections or arms I' and $VIII$. In the arms or branches are situated the pivots 5, 6. Between the arms or projections I' is journaled a spindle II (preferably tubular), between screws s in the arms I' . The spindle II carries pairs of arms III IV between which are journaled short spindles VII between screws s' these short spindles carrying the pens f' and f^3 on arms X . The middle pen f^2 is rigidly connected to the spindle II by an arm IX . All the three pens may be turned about the axis of II , thus being raised from the paper. The arms III of the spindle II are provided with projecting blades V which project under the arms X . These arms do not bear directly upon the blades V but upon adjusting screws s^2 by which the pens f' and f^3 can be adjusted to suit the pen f^2 by raising or lowering the arms X . Also as the arms X are supported on the blades V the pens f' and f^3 are raised simul-

5 taneously with the pen f^2 , which is necessary
 when a word is to be begun or a point made.
 The pens f' and f^3 press upon the paper by
 means of their own weight. On the pivot p
 10 of the left projection I' is provided a stop-
 ping or catching device $g h$, movable about
 the vertical pin p so as to slide under the arms
 III of the part II. The bent lever h has on
 its face a sloping surface such that it can be
 15 easily slid under the arm III, and by so lift-
 ing it, all the pens are simultaneously raised.
 In beginning to write the pens are lowered
 by turning the catching device $g h$ to the left.
 The whole apparatus rolls upon four roll-
 20 ers, two near 2 and 3 with their axes parallel
 to C. The other two rollers are mounted be-
 low the projections VIII as casters, to turn
 about a vertical and a horizontal axis so as
 to follow all movements of the parallelogram.
 25 The device for supporting and lifting the
 pens applies also to the construction shown
 in Fig. 1 which has rollers near 5 and 6 and
 between 2 and 3. As a drawing or writing
 pen I may employ a fountain pen as repre-
 30 sented in longitudinal section in Fig. 5.
 The cylindrical reservoir R is provided at
 the bottom with a steel cone with capillary
 passage and receives from the top through
 the cap a tube T open at both ends to admit
 35 air to fill the space above the level o of the
 ink, to equalize the internal and external
 pressures so that the column of pressure upon
 the writing point is the height of the lower
 mouth of the air-tube above the writing
 point. Thus the ink discharges uniformly so
 long as its level is not below the lower mouth

of the air-tube. The pressure may be in-
 creased or diminished by raising or lowering
 the air-tube.

Having now particularly described and as- 40
 certain the nature of this invention and in
 what manner the same is to be performed, I
 declare that what I claim is—

1. In a pantograph a device for lifting or
 raising the writing or drawing appliances, 45
 consisting of a shaft II journaled in the arms
 I' of the side I; said shaft II carrying (by
 means of arms III and IV) another shaft VII,
 the latter carrying by means of arms X the
 writing appliances and the shaft II carrying 50
 by an arm IX also a drawing-pen &c., and
 the arms X, X being carried by blades or
 curved levers V, V of the shaft II, so that
 when the pen f^2 is raised the shaft II is
 turned and by that the other pens f' f^3 are 55
 lifted by means of the arms V V; as set forth.

2. In a pantograph a device for raising and
 catching the writing appliances, when the ap-
 paratus is not used, consisting of a curved
 blade $g h$, having a sloping surface and be- 60
 ing articulated to the shaft I and adapted to
 engage by means of the arm h under the pro-
 jections III V; as set forth and for the pur-
 pose specified.

In testimony whereof I have signed this 65
 specification in presence of two subscribing
 witnesses.

LJUBOMIR KLERITJ.

Witnesses:

STOJAN MARKOVITSCHY,
 BOGDAN GAVRILOVITCH.