(No Model.) 2 Sheets—Sheet 1.

L. KLERITJ.

POLYPANTOGRAPH.

No. 512,719. Patented Jan. 16, 1894.

Fig. 1

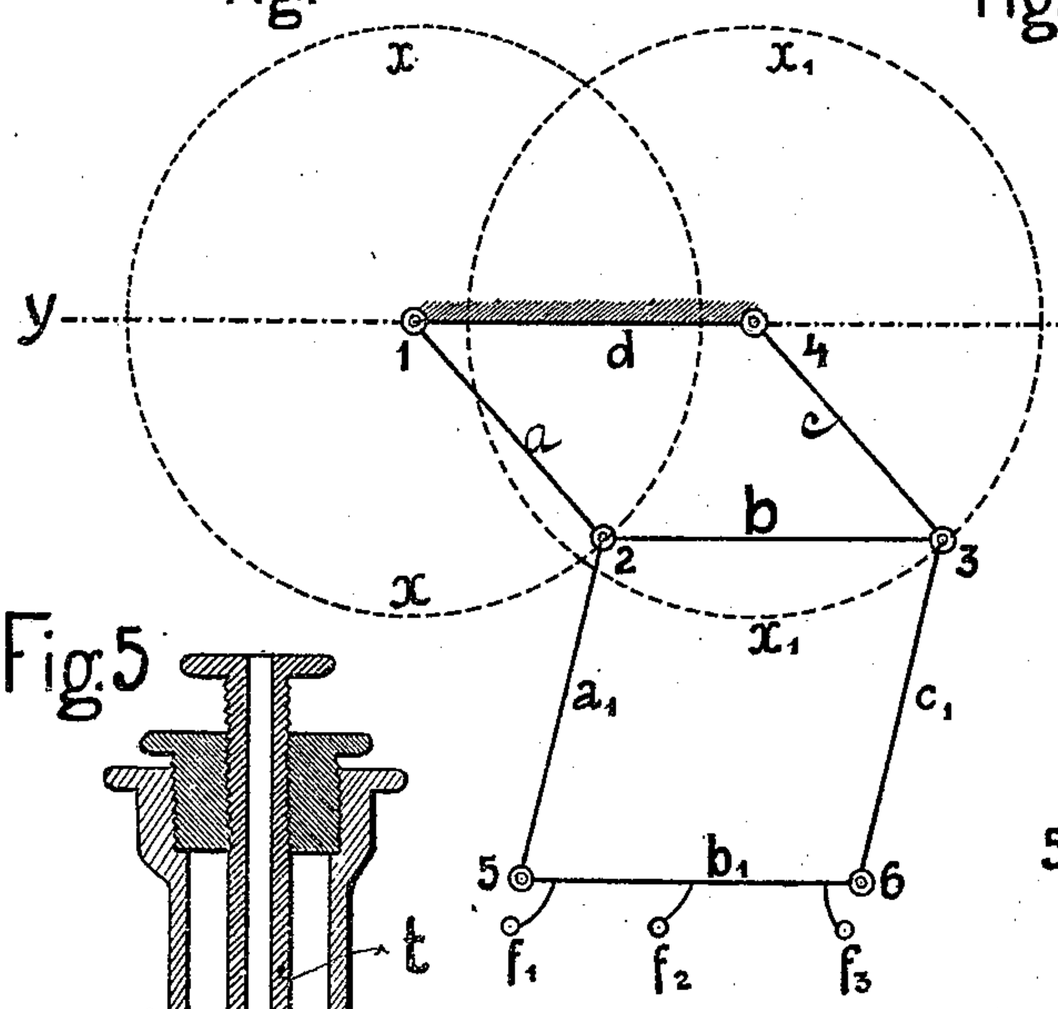


Fig. 2

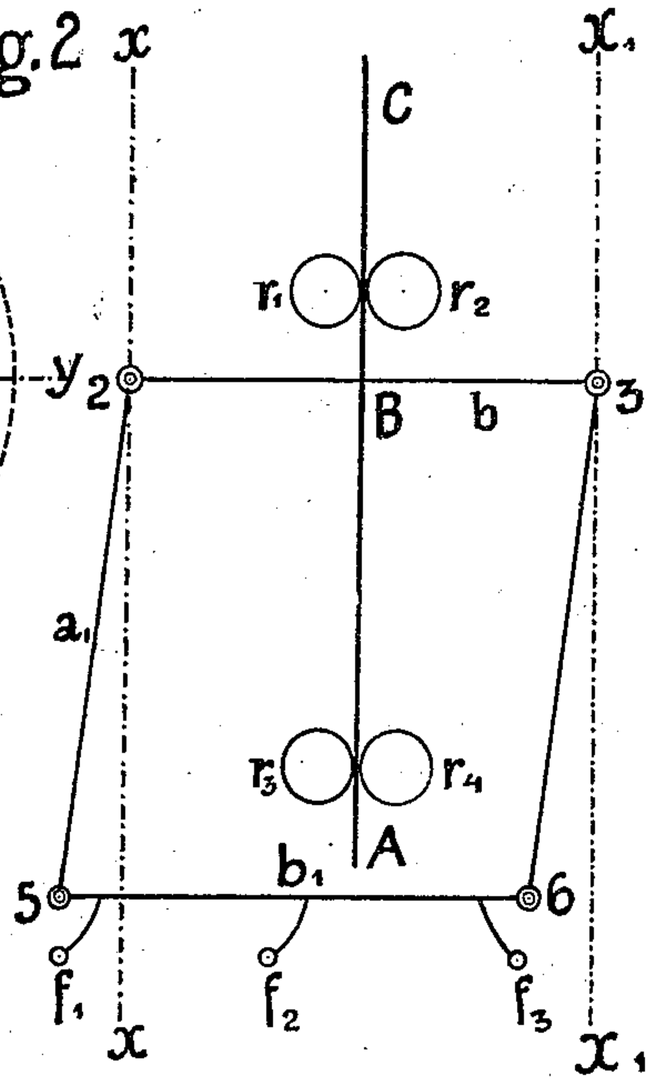


Fig. 5

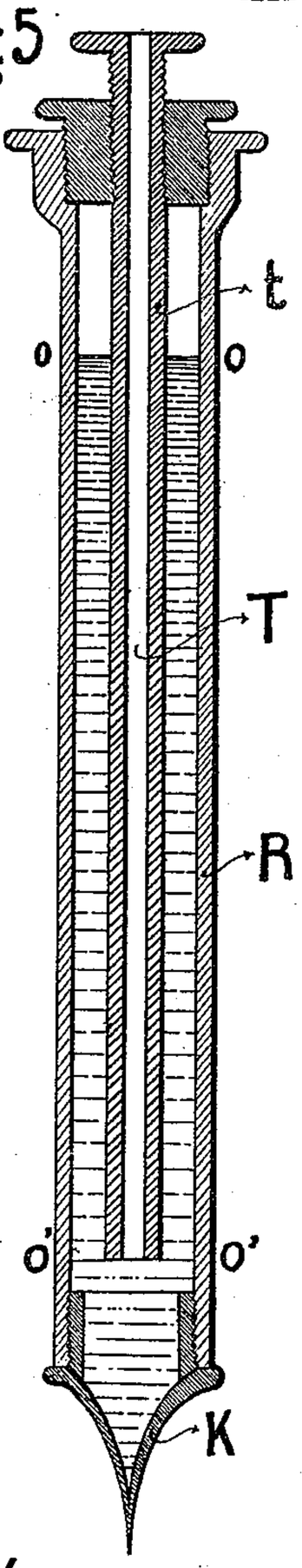
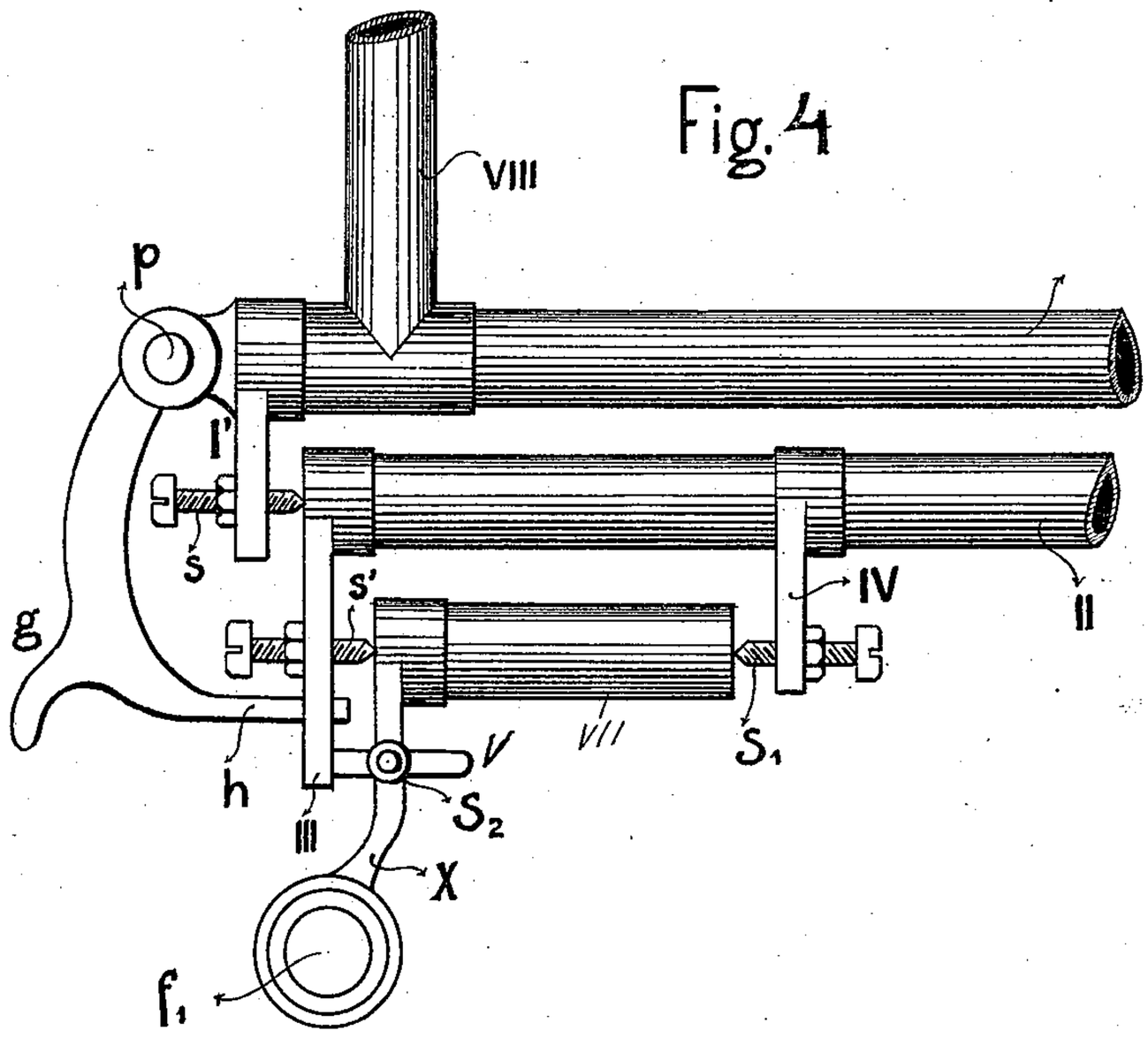


Fig. 4



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(No Model.) 2 Sheets—Sheet 2.

L. KLERITJ.

POLYPANTOGRAPH.

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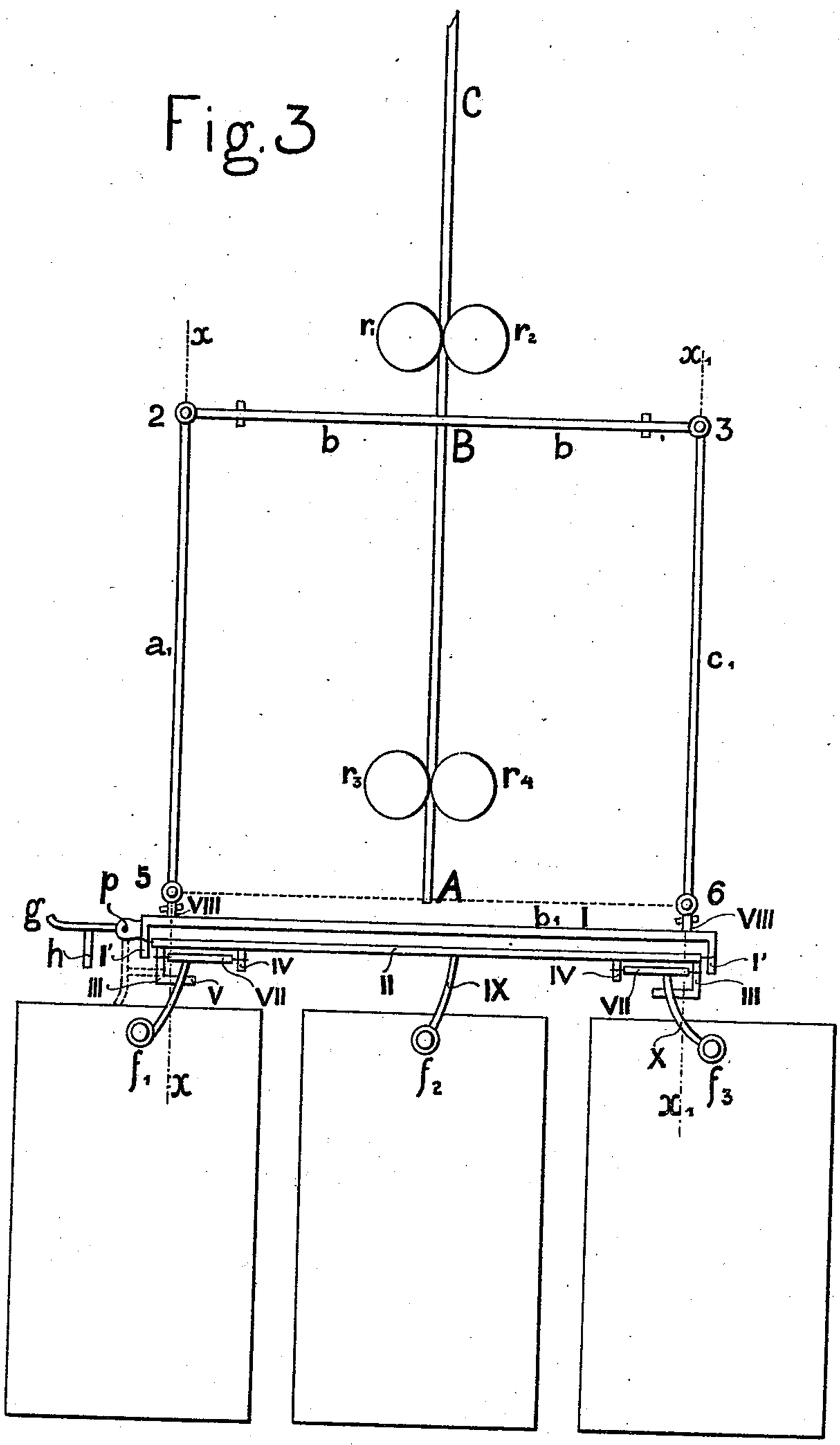
Fig. 3



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UNITED STATES PATENT OFFICE.

LJUBOMIR KLERITJ, OF BELGRADE, SERVIA.

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 $a\ b\ c\ d$ and $a'\ b'\ c'\ b$. The coupling side b may be supposed to slide along the circumferences of the circles $x\ x'$ 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 $f'\ f^2\ f^3$, 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 $y\ y$ 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 A B C, parallel to x and x' and rigidly connected at B to the side b sliding between two pairs of stationary rollers $r'\ r^2$ and $r^3\ r^4$, 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 $f'\ f^2\ f^3$ 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-

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 of the left projection I′ is provided a stopping 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 easily slid under the arm III, and by so lifting 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 rollers, two near 2 and 3 with their axes parallel to C. The other two rollers are mounted below the projections VIII as casters, to turn about a vertical and a horizontal axis so as to follow all movements of the parallelogram.

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 represented 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 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 increased or diminished by raising or lowering the air-tube.

Having now particularly described and ascertained 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, 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 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 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 apparatus is not used, consisting of a curved blade $g\ h$, having a sloping surface and being articulated to the shaft I and adapted to engage by means of the arm h under the projections III V; as set forth and for the purpose specified.

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

LJUBOMIR KLERITJ.

Witnesses:
STOJAN MARKOVITSCHY,
BOGDAN GAVRILOVITCH.