

No. 747,380.

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J. F. COOKE & A. KELLER.

RULER.

APPLICATION FILED APR. 2, 1903.

NO MODEL.

Fig. 1.

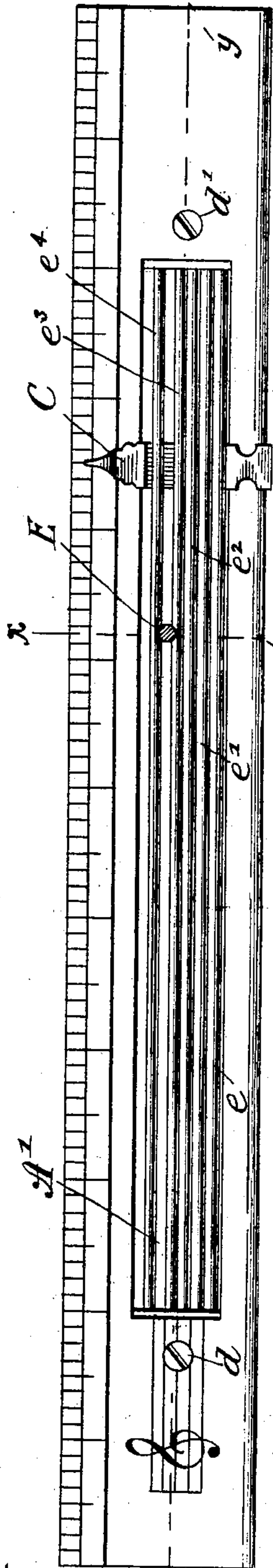


Fig. 3

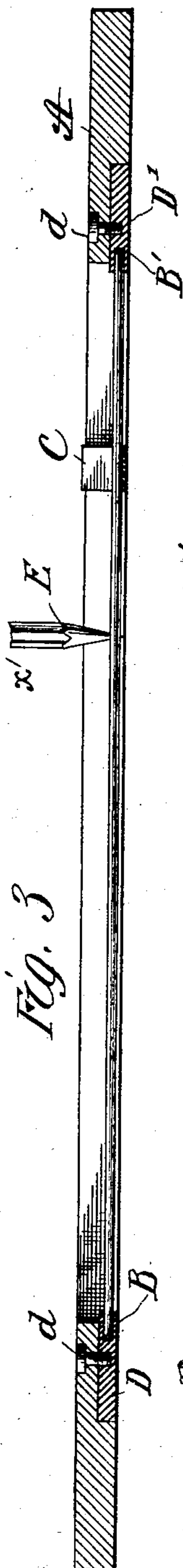


Fig. 4.

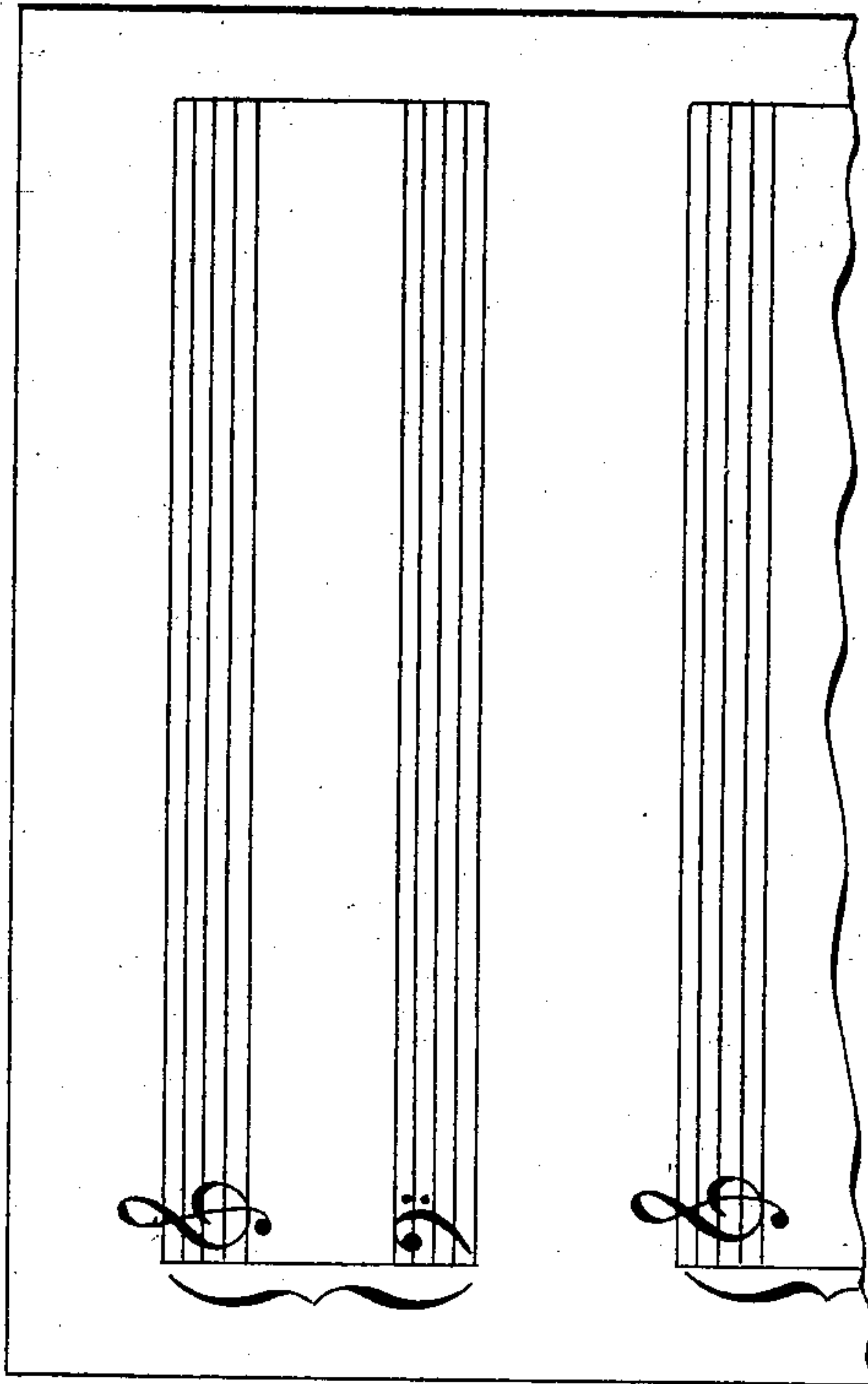
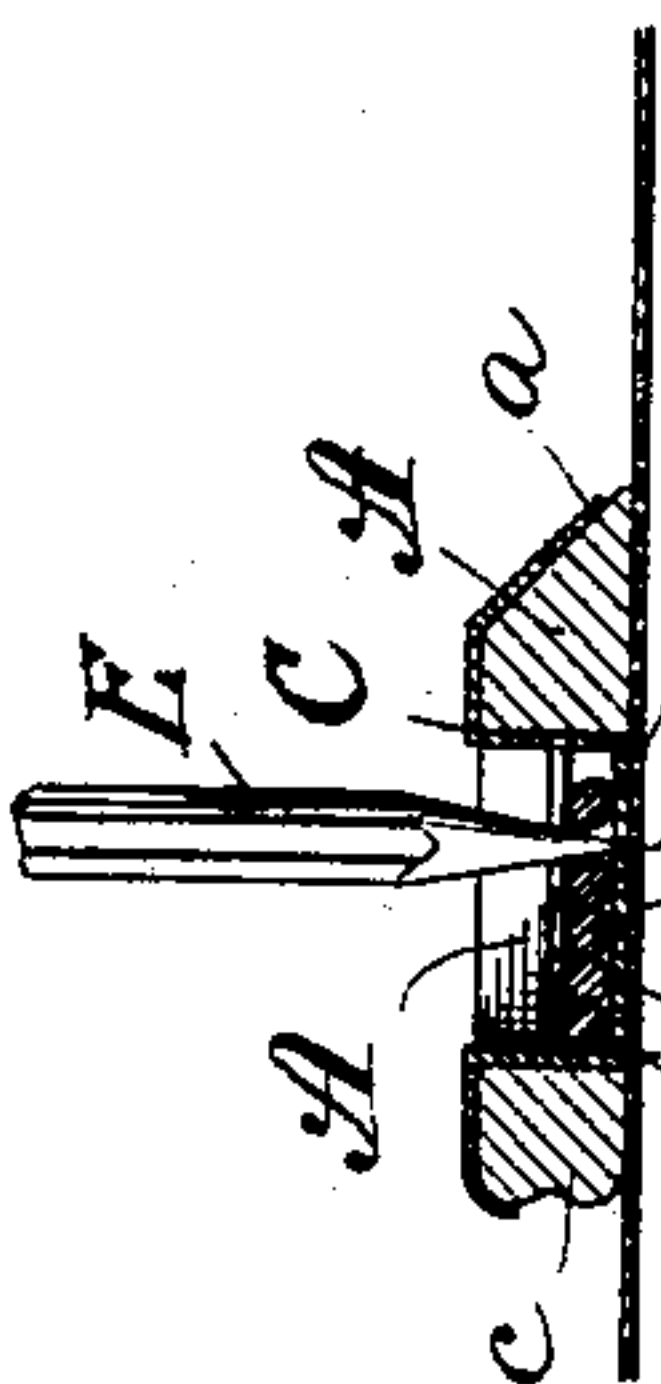


Fig. 2.



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RULER.

SPECIFICATION forming part of Letters Patent No. 747,380, dated December 22, 1903.

Application filed April 2, 1903. Serial No. 150,772. (No model.)

To all whom it may concern:

Be it known that we, JAMES FRANCIS COOKE and ADAM KELLER, both citizens of the United States and both residents of the borough of Brooklyn, city of New York, county of Kings, and State of New York, have jointly invented certain new and useful Improvements in Rulers, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of a ruler embodying our improvements. Fig. 2 is a vertical transverse section taken on the line xx of Fig. 1. Fig. 3 is a vertical longitudinal section taken on the line yy of Fig. 1. Fig. 4 is a view of a sheet containing lines ruled thereon with the assistance of our said ruler.

In the drawings similar letters refer to similar parts.

Where a plurality of lines are required to be inscribed or ruled parallel to each other and equally spaced—as, for instance, in the production on paper of the staff used in musical notation, consisting of five lines so disposed—an ordinary single ruler adapted to guide the pen or other stylus in making only a single line must be separately adjusted in position for the making of each subsequent line or ruling which may be required after the initial line parallel with the latter. Such movement and readjustment of the ruler requires, manifestly, exceptional care, accuracy, time, and skill, else the lines or rulings will fail to be equally spaced and perfectly parallel. On the other hand, while certain rulers have been devised whereby a plurality of parallel and equally-spaced lines or rulings may be made without moving the ruler these have proved comparatively unsatisfactory because of the immovability of the guiding edges relatively to each other and to the outer edges of the ruler, whereby it has been impossible with such rulers to vary conveniently the spacings between the resulting lines, and particularly the pens, pencils, or other marking instrumentalities of varying dimensions and shapes, to accommodate the requirements of each case to the particular marking instrument which the draftsman may at the time have occasion to use.

The object of our invention is to produce as a new article a ruler adapted in the mak-

ing of a plurality of parallel equally-spaced lines to guide successfully any marking instrumentality, whatever its shape or dimensions, from a draftsman's pen to a slate-pencil with equal freedom, ease, and certainty and without moving or readjusting the ruler as a whole during the entire operation, also to produce such a ruler adapted through easy manipulation and substitution of parts to vary as required the spacings between the plurality of lines produced with its assistance; and the object of our invention, more specifically, is to produce a ruler having the aforesaid characteristics and particularly adapted to the production by the unskilled, such as school children, of a perfect musical staff or of such portions of such a staff predeterminedly located, as may be required. We accomplish these objects by the instrumentalities hereinafter described, preferred forms of which are illustrated by the drawings, in which—

A is the body of the ruler, constituting the frame supporting our improvements. This body may, as in the case of any ruler, be constructed of any suitable material possessing the requisite rigidity—as, for instance, wood or metal. The external contours and the proportions of A may be varied, as preferred. In the instance illustrated in the drawings we have shown this frame as approximating in general proportions and effect an ordinary single ruler having a beveled metal cutting edge a on one side and on the other a rolled ruling edge c , said beveled edge being provided for convenience, if desired, with a rule scaled, as shown. Through the said body or frame of the ruler A is provided an interior longitudinally-disposed open space or slot A'. The dimensions of this slot are dependent upon the size of the ruler, the maximum length of the line required to be ruled thereby, the number of lines, the aggregate extent of the intervening spaces between the lines, and the maximum thickness of the pen, pens, or other tracing instrumentalities intended to be used. At each end of this slot A' are provided or secured in any convenient manner recesses or holding members B B'. The dimensions of these recesses are such as to receive and loosely and movably secure therein the opposite extremities, respectively, of

a ruling-rod *e* or a plurality of such rods *e*, *e'*, &c.

e represents one of our improved rulers proper, and consists of a rod of suitably rigid material—as, for instance, metal—having its external edges, or a plurality of such edges, parallel with its central longitudinal axis, such rod being preferably cylindrical, as shown in the drawings, though it might be also of triangular or polyhedral cross-section. Each end of said rod is loosely held in one of the aforesaid recesses or holding members B, the said ends projecting sufficiently within the said recesses to insure the retention of the rod within the ruler at whatever angle disposed relatively to the sides of the slot A', and the diameters of the ends of the rod are so much less than the width of the said recesses or holding members as to afford free play to the rod within the recesses, so that the rod may be readily shifted to any desired position within the slot by slight pressure from the pen or other tracing instrumentality employed. Where a plurality of rods are employed—as, for instance, as shown in the drawings, where five rods *e e' e² e³ e⁴* are used to adapt the ruler to the lining of a musical staff—each of said rods is similar to the others in form, dimensions, and combination with the recesses or holding members B B', as aforesaid. From this construction and arrangement it will be evident each of the rods may be successively moved relatively to the ruler and to each other by a slight pressure applied by the pen or other writing instrumentality to the side thereof and also that the entire group of rods may be simultaneously so moved, if required, relatively to the frame and the sides of the opening or slot A' within the ruler, and it may be added that should rods of polyhedral cross-section be preferred it is desirable that the extremities of the rods recessed within the recesses B B' should be of circular cross-section, as the aforesaid movement of the rods will thereby be facilitated.

It is preferable that the recesses or pockets B B' should be of such construction as to admit when required of the ready withdrawal therefrom of the rods in order that their number may, if required, be diminished or increased or rods of varying diameters interchanged. We have illustrated in the drawings one construction of such recesses, consisting of a removable casing D D', fitted within corresponding recesses in the frame A and removably secured to the latter by screws *d d'*. It will be observed that the recesses or holding members B B' are preferably so elevated within the frame as to raise the rods *e*, &c., above the base of the ruler and out of contact with the material to be ruled.

As the construction described does not in all cases admit of the paper or other material underlying the ruler being inspected with the same freedom as though an ordinary single ruler were employed, we provide an indi-

cator or guide C, longitudinally movable relatively to the rods and to the frame A. In the present instance we have shown such indicator as constructed of a piece of metal suitably shaped, as shown, to bear and slide upon the upper surfaces of the frame A and the underlying surfaces of the rod or rods, whereby it is movably held in position and with sufficient friction and pressure to insure the requisite stability.

The operation of the device is as follows: The ruler is laid flat in the position shown in Fig. 1 upon the paper or other material to be ruled. It is then so adjusted relatively to such paper as to bring the first line to be ruled along the rod *e* into the required position. The pen or other ruling instrumentality E, Fig. 2, is then inserted into slot A', brought into contact with the rod chosen to effect the guiding of the first line—say *e*—and before descending upon the paper is caused to crowd said rod against its proximate longitudinal inner edge of the slot. This done, the nib of the pen is brought into requisite contact with the underlying paper and the line drawn, the pen being guided by pressure against the rod *e*. When a plurality of lines are to be drawn, the pen is withdrawn (the entire ruler being held stationary) and is in turn inserted against the next rod—say *e'*—and the foregoing operation repeated, with the sole difference that in this instance the pen crowds the second rod against the first, which now acts as a support to the ruling-rod, owing the former still bearing against the side of the slot. The operation is repeated according to the number of parallel lines desired and the number of rods contained, as aforesaid, within the slot.

It will be observed that the spacing of the parallel lines may be varied either by varying the number of rods embraced between the successive descents of the pen or by varying the relative diameters of the rods. It will also be observed that, provided free space sufficient is left within the slot A', marking instrumentalities of widely-varying thicknesses may be employed—as, for instance, either an acutely-sharpened or blunt slate-pencil. The length of the line or lines may be readily predetermined and fixed by means of the indicator C, having one of its terminals, as shown, contacting with the scale on the beveled edge *a*. The indicator is moved until it registers the desired distance, and the marking instrument is stopped by bringing up against the part of the indicator underlying the ruling-rods. It will also be observed that the indicator C is, by passing beneath and in contact with the rods *e e'*, &c., adapted to afford to the latter additional support.

By means of our improved device those most unskilled in drawing are able to produce with entire accuracy and ease and to any extent and in any required location on the page that desideratum, an accurately-

drawn manuscript staff, and also to produce, as may be required, combinations and groupings of parallel lines spaced relatively to each other, as may be desired and predetermined.

5 It will be understood that in order to produce variations in the spacings between the resulting lines it is only necessary to release and remove the uniform rods illustrated in the drawings and substitute in lieu thereof
10 either a plurality of rods of larger diameter or a group of rods of relatively varying diameters, such diameters in each instance determining the distance between adjacent resulting lines. It will also be observed that
15 the ruling-rods may be readily cleaned either as they stand in the frame or, if special cleaning is desired, by removing the same from the pockets, as aforesaid, cleaning the rods in any convenient manner and returning
20 them to their original position in the ruler, one of the important features of utility involved in our invention residing in the facility with which the ruling instrumentality proper may be thus cleaned and freed from
25 accumulations of ink or other matter.

We are aware that parallel rulers have heretofore been constructed comprising a plurality of adjustable bars provided at each end with sockets through which are threaded
30 opposite parallel members of a supporting-frame, so that the said bars may be shifted relatively to each other and to a given portion of said frame; but such rulers are so constructed that the said bars contact directly with the paper to be ruled because of
35 their said sockets pressing directly upon such paper, so that the entire ruler, including its frame, is directly supported upon the paper by the sockets themselves, whereby the said
40 bars when the ruler is pressed upon the paper can be moved relatively to each other and to the frame only with difficulty owing to the friction of the sockets against the paper, whereby it becomes difficult, if not impossible,
45 to rule by means of said rulers a plurality of parallel lines unless the said bars are preliminarily adjusted to the required position and clamped or otherwise positively secured in such position for the purpose of
50 the particular ruling in hand, and therefore all such parallel rulers, so far as we know, are provided with positively-clamping members, whereby after the preliminary adjustment of the bars rendered possible by their
55 movability they are necessarily finally clamped in the desired position and kept so clamped during the operation of ruling paper by their assistance. We therefore do not wish to be understood as claiming any such
60 device, the distinguishing characteristic of our said ruler being its construction in the manner before described, so that the rods are at all times, and particularly during the operation of ruling, completely loosely held,
65 having no part thereof in contact with the material to be ruled and being free to move except in so far as they are caused to merely

bear or abut by the pencil or other marking instrument for the time being during the operation of ruling against a stationary portion or portions of the frame or against another similar rod so bearing. 70

We are also aware that ruling devices have been described in which a plurality of ruling-strips fixedly secured together and incapable
75 of movement independently of each other have been movably held in a frame partly by insertion of terminal portions of said strips within slots in oppositely-disposed
80 sides of said frame; but in this case the said ruling-rods have been so proportioned, disposed, and secured relatively to each other and to the said frame as not only to preclude possibility of movement independently of
85 each other, but also of said ruling-strips even to a limited extent obliquely within said slots and so relatively to the said frame, and it has been necessary to provide the said ruling-strips or their connected parts with additional devices—such as shoulders, hook-
90 plates, thumb-screws, and the like—to guide, clamp, and retain said strips within the frame and to prevent them from escaping therefrom, whereas by our invention and its said proportioning and disposing of our
95 ruling-rods relatively to our said recesses and to the frame and to each other we are enabled not only to dispense with such auxiliary retaining parts, but also to impart to the ruling-rods individually and as an aggregation complete freedom of movement
100 within the said recesses not only rotatively around their respective axes, but also longitudinally and obliquely, whereby our said ruler is available at all times and without
105 preliminary or skilled adjustment of its parts for the production of the required number of parallel lines by the use of a marking instrumentality of any size or shape, the location of the particular ruling-rod used in making
110 the first line determining the position of each subsequently-used rod of the series and the location of the resulting line without other adjustment or securement in position than
115 follows from the usual pressure imparted to each rod in turn by the ordinary action of the pen, pencil, or other instrumentality.

What we claim as new, and desire to secure by Letters Patent, is the following, viz:

1. A ruler comprising a frame having a base
120 bearing directly upon the article to be ruled and an inner open space bounded on each hand by one of two oppositely-disposed sides each provided, above said base, with a recess, and a ruling-rod disposed transversely of said
125 open space and having cylindrical ends loosely inserted in said recesses, and free to move therein rotatively and also longitudinally and obliquely thereof, the said ruling-rod being
also so disposed and proportioned relatively
130 to said open space and recesses, as to be normally retainable within said frame by engagement of some parts of said rod against some parts of said oppositely-disposed sides, in-

cluding the walls of their said recesses, substantially as and for the purposes described.

2. A ruler comprising a frame provided with two oppositely-disposed recesses, and a plurality of cylindrical-ended ruling-rods, each movable independently of the other, each loosely inserted, at each end, within one of said recesses and free to move therein rotatively, and also longitudinally and obliquely thereof, and each so disposed and proportioned relatively to each other and to said recesses, as to be normally retainable within said frame by engagement of some parts of said rods against some parts of the walls of said recesses, substantially as and for the purposes described.

3. A ruler comprising a frame provided with two oppositely-disposed recesses, and a plurality of cylindrical ruling-rods; each movable independently of the other, each loosely inserted, at each end, within one of said recesses and free to move therein rotatively, and also longitudinally and obliquely thereof, and each so disposed and proportioned relatively to each other and to said recesses, as to be normally retainable within said frame by engagement of some parts of said rods against some parts of the walls of said recesses, substantially as and for the purposes described.

4. A ruler comprising a frame having a base bearing directly upon the article to be ruled and an inner open space bounded on each hand by one of two oppositely-disposed sides each provided above said base with a recess, and a plurality of ruling-rods disposed transversely of said open space, each movable independently of the other, each loosely inserted, at each end, within one of said recesses and free to move therein longitudinally and obliquely thereof, the said ruling-rods being also so disposed and proportioned relatively to each other and to said open space and recesses as to be normally retainable within said frame by engagement of some parts of said rods against some parts of said oppositely-disposed sides including the walls of their said recesses, substantially as and for the purposes described.

5. A ruler comprising a frame having a base bearing directly upon the article to be ruled and an inner open space bounded on each hand by one of two oppositely-disposed sides each provided, above said base, with a recess, and a plurality of cylindrical-ended ruling-rods disposed transversely of said open space, each movable independently of the other, each loosely inserted, at each end, within one of said recesses and free to move therein rotatively, and also longitudinally and obliquely thereof, the said ruling-rods being also so disposed and proportioned relatively to each other and to said open space and recesses as to be normally retainable within said frame by engagement of some parts of said rods against some parts of said oppositely-disposed sides including the walls of their said recesses,

substantially as and for the purposes described.

6. A ruler comprising a frame having a base bearing directly upon the article to be ruled and an inner open space bounded on each hand by one of two oppositely-disposed sides each provided, above said base, with a recess, and a plurality of cylindrical ruling-rods disposed transversely of said open space, each movable independently of the other, each loosely inserted at each end within one of said recesses and free to move therein rotatively, and also longitudinally and obliquely thereof, the said ruling-rods being also so disposed and proportioned relatively to each other and to said open space and recesses as to be normally retainable within said frame by engagement of some parts of said rods against some parts of said oppositely-disposed sides including the walls of their said recesses, substantially as and for the purposes described.

7. A ruler comprising a frame provided with two oppositely-disposed recesses and removably secured holding members, a plurality of ruling-rods each having one of its ends loosely and movably held within and by the recess in one of said holding members, whereby on removing said holding members said rods may be withdrawn and corresponding rods of varying diameters substituted and interchanged.

8. A ruler comprising a frame provided with two oppositely-disposed recesses, a ruling-rod having each of its opposite ends inserted and loosely and movably held within and by the walls of the recess in one of said holding members, and an indicator disposed transversely and movable longitudinally of said rod and registering with a scale upon said frame.

9. A ruler comprising a frame provided with two oppositely-disposed recesses, a plurality of ruling-rods each having one of its opposite ends inserted within and loosely and movably held by walls of one of said recesses, and an indicator disposed transversely and movable longitudinally of said rods and registering with a scale upon said frame.

10. A ruler comprising a frame provided with two oppositely-disposed recesses, a ruling-rod having each of its opposite ends inserted and loosely and movably held within and by the walls of said recess in one of said holding members, and an indicating and stopping member disposed transversely of and movable longitudinally of said rod and registering with a scale upon said frame.

11. A ruler comprising a frame provided with two oppositely-disposed recesses, a plurality of ruling-rods each having one of its opposite ends inserted within and loosely and movably held by the walls of one of said recesses and an indicating and stopping member disposed transversely of and movable longitudinally of said rods and registering with a scale upon said frame.

12. A ruler comprising a frame provided

with two oppositely-disposed recesses, a ruling-rod having each of its opposite ends inserted and loosely and movably held within and by the recess in one of said holding members, and an indicator disposed transversely, and movable longitudinally, of said rod.

13. A ruler comprising a frame provided with two oppositely-disposed recesses, a plurality of ruling-rods each having one of its

opposite ends inserted and loosely and movably held within one of said recesses and an indicator disposed transversely, and movable longitudinally, of said rods.

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