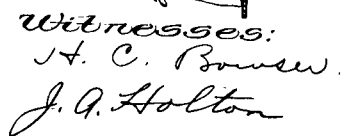


1,055,785.

2 SHEETS—SHEET 1.



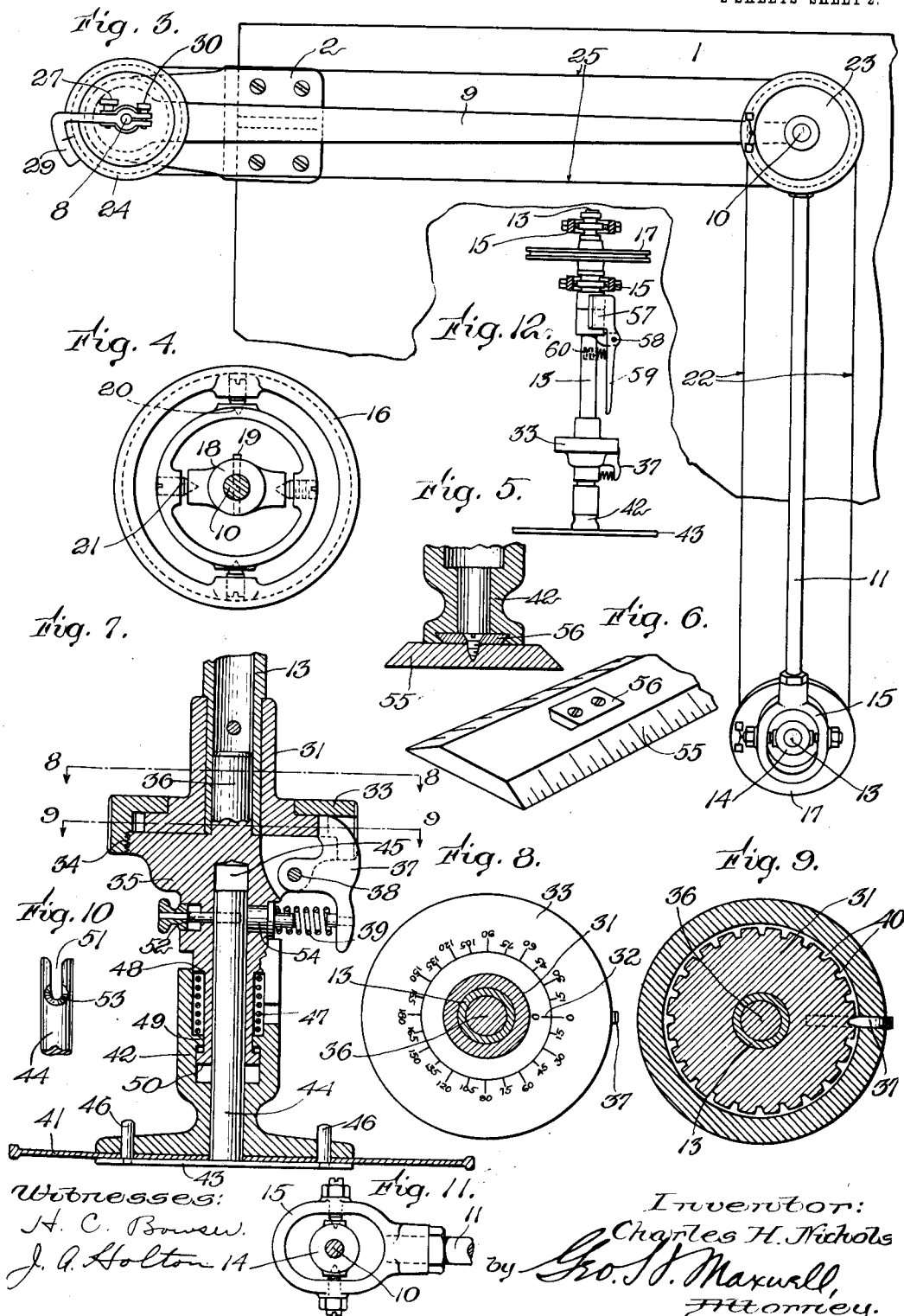
Inventor:
Charles H. Nichols,
by Geo. H. Maxwell,
Attorney.

C. H. NICHOLS.
 TEMPLET HOLDING AND DIRECTING MACHINE.
 APPLICATION FILED MAY 20, 1910.

1,055,785.

Patented Mar. 11, 1913.

2 SHEETS—SHEET 2.



Witnesses:
 H. C. Bowen.
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UNITED STATES PATENT OFFICE.

CHARLES H. NICHOLS, OF HAVERHILL, MASSACHUSETTS, ASSIGNOR TO SMALL, NICHOLS & CO., INC., OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

TEMPLET HOLDING AND DIRECTING MACHINE.

1,055,785.

Specification of Letters Patent.

Patented Mar. 11, 1913.

Application filed May 20, 1910. Serial No. 562,444.

To all whom it may concern:

Be it known that I, CHARLES H. NICHOLS, a citizen of the United States, residing at Haverhill, in the county of Essex and State of Massachusetts, have invented an Improvement in Templet Holding and Directing Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention is a machine for the use of pattern makers, and draftsmen, and has for its object the provision of means for holding a pattern (for instance a shoe pattern), a drafting instrument (for instance a ruler, T-square, or triangle), or any other directing tool or device from which a copy is to be made or which is to be used in making a plan or a drawing.

In carrying out my invention, I provide a holder in which the tool, for instance, a ruler, is so mounted that said holder may be moved in all directions and yet will maintain said ruler at all times in parallelism to itself, by which I mean that the ruler when moved from one position to any other position will remain parallel to its original position, unless purposely changed in direction. Besides this leading feature of my invention, it includes means for preventing the tool or ruler from dragging on the board, and means for maintaining the ruler unvaryingly in whatever direction it is placed irrespective of whatever position it may occupy, so that the tool may be used on a plurality of boards for making duplicate drawings, or, for example, for making an assembled drawing on one board and details on another board and yet preserve the identity of every corresponding angle and line on all the boards. Also I provide two protractors so arranged as to secure the results of a T-square or triangle by the use of a straight-edge or ruler.

Further features of my invention and advantages resulting therefrom will be pointed out in the course of the following description, taken with reference to the accompanying drawings, in which I have shown a preferred embodiment of the invention.

In the drawings, Figure 1 is a vertical sectional view through a work table show-

ing my machine in side elevation, parts being broken away in vertical section for clearness of illustration; Fig. 2 is an enlarged top plan view of the rear protractor; Fig. 3 is a top plan view of the instrument; Fig. 4 is a transverse sectional view showing in top plan one of the universal joints; Fig. 5 is a view in central vertical section through the rule holder and in transverse section through the rule held thereby; Fig. 6 is a broken-away perspective showing a portion of the rule and the means thereon coöperative with the holder for securing the same in place; Fig. 7 is an enlarged central vertical sectional view of a portion of the lower protractor and the tool holder; Figs. 8 and 9 are horizontal sectional views taken respectively on the lines 8 and 9 Fig. 7; Fig. 10 is an elevation of a fragmentary detail of the upper end of the tool-holding portion; Fig. 11 is a plan of a fragmentary detail of one end of a supporting rod; and Fig. 12 is a front elevation of the tool-carrying end of the device with the tool-carrying shaft extended and a brake fitted thereto.

As herein shown, I have mounted my instrument on a work table or drawing board 1 by means of a bracket 2 and screw clamp 3 whose head 4 engages the under side of the table, being operated by a hand wheel 5. In the outer end of the bracket is rigidly secured, as by means of a threaded end 6 and nut 7 a stationary shaft 8; on which an arm 9 is mounted to turn freely. At its outer or free end said arm is provided with relatively long vertical bearings in which is mounted a vertical shaft 10. On this shaft 10 are mounted two parallel rods or links 11, 12, which are secured at their outer ends to a vertical shaft 13 in the same manner that they are secured at their inner ends, see Fig. 11. Viewing Fig. 11, it will be seen that a bearing 14 is mounted to turn on the shaft 10 (or 13, as the case may be) and is pivotally connected at its ends by a yoke 15 to the rod 11 (or 12, as the case may be). Thus the shaft 13, while always free to be moved up or down with relation to the shaft 10, is maintained in absolute parallelism therewith. Also both of said shafts are free to turn axially at all times. Provision is made for compelling said shafts to maintain at all times the same relative axial po-

sition, the means herein shown for this purpose comprising a wheel or pulley 16 mounted on the shaft 10 and an identical wheel or pulley 17 mounted on the shaft 13, each of these being axially non-rotatable on its shaft but having capability of universal tilting movement in accordance with the changing positions of the rods or links 11, 12, as shown in Fig. 4, where it will be seen that the wheel 16 is connected by a gimbal or universal joint with a central bearing 18 fastened by a pin 19 to the vertical shaft, said universal joint having its pivots 20, 21 disposed at right angles to each other in well-known manner in this kind of a joint. The two pulleys 16 and 17 are connected to move in unison by any suitable means as by a belt 22 of piano wire wrapped a plurality of times around each pulley and pinned or fastened thereto.

At its upper end the shaft 10 has fast thereon a pulley 23 connected to a pulley 24 on the upper end of the shaft 8, said two pulleys being connected to move in unison by means of a belt 25 of piano wire or non-yielding material the same as just described for the other pulleys. The pulley 24 is preferably capable of adjustment on the shaft 8, being provided for this purpose with a split collar 26 and a clamping thumb-screw 27. Its peripheral top edge is graduated to provide a protractor scale 28, Fig. 2, and a protractor arm or sector 29 is mounted on the post 8 to cooperate therewith, being held clamped in desired adjustment by means of a thumb-screw 30.

At the lower end of the shaft 13 is secured a shouldered part 31 of a protractor, herein shown as having a zero mark 32 to register with a graduated scale on an annular member 33 which is mounted to move in the adjacent shouldered flange of the part 31 and is threaded at 34 to the peripheral portion of a block 35. This block has a central part 36 which serves to center it and afford pivotal movement relatively to part 31 and shaft 13, and at one side it is provided with a dog 37 pivoted at 38 and normally held in locking position by a spring 39. This dog engages notches 40 provided in the shouldered periphery of the part 31.

At the lower end of the block 35 is a foot piece for holding a ruler or pattern 41, consisting, as herein shown, of a sleeve-like member 42 and a thin clamping member 43 which constitutes the head of a stem 44 which enters vertically in the sleeve 42 and in a vertical recess 45 provided therefor in the block 35. This plate 43 is provided with studs 46 extending rigidly upwardly therefrom to pass through the pattern, ruler or the like 41, and the foot or laterally extended base of the part 42. The latter is normally held downward by a spring 47 bearing at its upper end against a shoulder

48 of the block 35 and at its lower end against an inwardly extending flange 49 of the member 42, being retained permanently in position by a flange 50 of said block member 35. The flanges 49 and 50 on the members 42 and 35 respectively are arranged to interlock to prevent accidental displacement of the member 42. These parts may be initially assembled by having portions of each of the flanges 49, 50 cut away so that they may be slipped past each other and then turned partially around so as to interlock as is usual in bayonet joint connections. The upper end of the stem 44 is provided with a slot 51 to straddle a hand controlled pin 52, the lower end of said slot having an enlargement or socket 53 to be engaged by the beveled inner end of a plunger 54 held yieldingly by the spring 39 in position to engage and lock said stem 44 when shoved upwardly. I do not limit myself to this means of holding the tool. In Fig. 6 I have shown a ruler 55 as provided with a dovetail block 56 for entering the foot member 42, Fig. 5. It is desirable that means be provided for locking or braking the movable parts which carry the ruler so as to render them rigid at will in any position desired, and to this end, as shown in Fig. 12, a brake 57 may be provided, this being shown as pivoted at 58 to the bracket which supports the shaft 13 and having an operating arm 59 extending outward from the pivot with a spring 60 operating thereagainst to normally urge the brake shoe against the shaft 13. Thus, when it is desired to move and adjust the ruler, a pressure upon the arm 59 will move the brake shoe away from the shaft, compressing the spring 60 so that the parts may be freely moved while upon release of the arm 59, the spring 60 will urge the brake shoe against said shaft to lock the same from rotation and hold the parts rigid in the position to which they are adjusted. It will also be understood that I am not restricted to the precise constructional details herein shown in the preferred embodiment of my invention, inasmuch as many variations in details of construction, arrangement and combination, may be resorted to without departing from the spirit and scope of my invention.

In use, the machine is fastened to a table or the like as shown in Fig. 1 and then the operator secures the pattern, ruler or other instrument to the foot of the tool holder as shown for instance in Figs. 1 and 7. The thumb-screw 27 of the protractor 28 is then loosened and the ruler is turned accurately by the operator to coincide with the base line of the drawing or piece of work that is to be done, whereupon the thumb-screw 27 is tightened. The thumb-screw 30 is then loosened and the sector 29 is swung so as to

bring its zero line to the zero point of the protractor 28, whereupon its thumb-screw 30 is again tightened. The arm portion of the machine is now swung so as to bring the ruler into proper relation to the paper which is fastened to the board and on which the drawing is to be made, and a base line is drawn with reference to the ruler, said ruler being necessarily in parallelism with its former position before swinging of the arm, because it is positively so held by means of the belts 22, 23 and pulleys and shafts from the protractor 24. It may be shifted from the base line to any extent desired, as for shading or making other lines parallel to the base line, without any danger of getting it out of parallelism with the base line. If now it is desired to draw a line at any desired angle from the base line or from any of these other lines, said angle is laid off by means either of the protractor 24 or the protractor 33, preferably the latter. In this manner the apparatus serves the same purpose as the ordinary T-square and triangle, without requiring the operator to maintain the usual plurality of separate movable parts in proper engagement and relation to each other and also without the danger commonly due to the slipping of said plurality of parts as ordinarily used by a draftsman. But by having several sheets of paper secured to the table in convenient relative position, the operator may carry along the making of several similar drawings at the same time, simply swinging the drawing tool from one sheet to another for the successive lines, without any danger of changing the relative angle or getting the wrong measurements, etc. This is particularly useful in making detailed drawings from an assembled drawing or vice versa. There is no inconvenience in handling the tool and there is no tendency to drag the same over the paper as in the case of a triangle, ruler or other ordinary flat drafting instrument when lying upon the paper. By having two protractors, a given variation may at any time be provided with accuracy with relation to any position into which the ruler or tool has been previously turned. For instance, if the ruler has already been turned ninety degrees from the base line by means of the protractor 33, and it is desired to turn it two degrees still farther without disturbing the measurement indication of the protractor 33, this is done simply by turning the protractor 24 said two degrees with relation to the indicator arm 29. Whenever a different tool is required, the operator simply pushes inwardly upon the pin 52, thereby disengaging the locking plunger 54 from the stem 44, thereby permitting the latter to be lowered to release the tool and receive another. The stem with its new tool or instrument in place is then

shoved upwardly so as to bring the tool hard against the member 42, the upward movement being continued until the same is again locked immovably in place on the block 35.

Having described my invention, what I claim as new and desire to secure by Letters Patent is,

1. In a device of the kind described, a support having means for enabling it to be held stationary on a table, a tool holder, a tool having a plane face and a straight edge, and flexible means connecting said support and tool holder, for maintaining the tool, as said holder is raised and lowered or moved to different positions relatively to the table, with its face parallel to the table, and its edge parallel to any given line throughout all of said movements.

2. In a device of the kind described, a tool holder, a tool having a plane face and a straight edge, supporting means for the holder, said means comprising jointed connections arranged to hold the face of the tool parallel to the table as said tool is raised and lowered relatively to said table, and means for maintaining the straight edge of the tool parallel to a given line at all times, irrespective of its said movement.

3. In a device of the kind described, a tool holder, a tool having a plane face and a straight edge, supporting means for said holder constructed and arranged to support said holder and tool over a table, and comprising flexible connections arranged to hold the face of the tool parallel to the table as it is raised and lowered relative thereto, means for normally maintaining the straight edge of said tool parallel to a given line throughout its said movement, and a plurality of adjusting means for angularly changing the position of said tool to a predetermined extent while held with its face parallel to said table.

4. In a device of the kind described, a jointed swinging arm, a tool holder mounted in the free end of said arm, provided with means for holding a tool immovably with relation to said holder, the outer tool holding end of said arm having connections to permit up-and-down movement as well as lateral swinging movement, and mechanism carried by said arm and holder for normally maintaining the tool parallel to a given line irrespective of said swinging and up and down movements.

5. In a device of the kind described, an arm mounted to swing on a fixed vertical axis and having an intermediate pivotal joint in parallelism with said axis, a tool holder mounted in the free outer end of said arm, said arm comprising means permitting the movement of the tool holder up and down while keeping it in parallelism with said vertical axis, adjusting means

operable on said vertical axis and transmission mechanism from said adjusting means to said tool holder for normally maintaining the latter parallel at all times to a given line irrespective of its swinging movement.

5 6. In a device of the kind described, an arm mounted to swing about a fixed vertical axis and having an intermediate joint in parallelism with said axis, a tool holder
10 mounted in the free outer end of said arm, adjusting means operable about said vertical axis for turning the tool holder through any desired angle and transmission mechanism from said adjusting means to
15 said tool holder for normally maintaining the latter parallel at all times to a given line irrespective of its swinging movement, said arm including means for maintaining the axis of adjustment of the tool holder
20 in parallelism with said fixed vertical axis throughout its ranges of movement.

7. In a device of the kind described, a stationary vertical pivot, a swinging supporting member pivotally mounted thereon to
25 swing in a horizontal plane, a vertical shaft in the free end of said member, a second supporting member having a two-direction pivotal mounting on said shaft to swing relatively thereto in a horizontal plane and
30 also in a vertical plane, a vertical shaft mounted in the free end of said second supporting member, a tool holder carried by said last-mentioned vertical shaft and a tool supported by said tool holder, and mechanism for turning said last-mentioned vertical shaft and its tool holder as they are swung with relation to said pivot so as to maintain the tool normally parallel to a given line.

40 8. In a device of the kind described, a stationary vertical pivot, a swinging supporting member pivotally mounted thereon to swing in a horizontal plane, a vertical shaft in the free end of said member, a
45 second supporting member having a two-direction pivotal mounting on said shaft to swing relatively thereto in a horizontal plane and also in a vertical plane, a vertical shaft mounted in the free end of said second
50 supporting member, a tool holder carried by said last-mentioned vertical shaft and a tool supported by said tool holder, and mechanism for turning said last-mentioned vertical shaft and its tool holder as they are swung with relation to said pivot so as to maintain the tool normally parallel to a given line, said mechanism including a protractor mounted on said fixed pivot.

9. In a device of the kind described, a
60 stationary vertical pivot, a swinging supporting member pivotally mounted thereon to swing in a horizontal plane, a vertical shaft in the free end of said member, a second supporting member having a two-direction pivotal mounting mounted on said

shaft to swing relatively thereto in a horizontal plane and also in a vertical plane, a vertical shaft mounted in the free end of said second supporting member, a tool holder carried by said last mentioned vertical shaft and
70 a tool supported by said tool holder, and mechanism for turning said last-mentioned vertical shaft and its tool holder as they are swung with relation to said pivot so as to maintain the tool normally parallel to a
75 given line, said mechanism including pulleys fast on each of said shafts and said pivots, and unyielding transmission bands between said respective pulleys.

10. In a device of the kind described, an
80 arm mounted to swing on a fixed vertical axis, a vertical pivot in the free end of said arm, a pair of rods forming a continuation of said arm and mounted to swing about said pivot, a tool holder mounted on the
85 free ends of said rods and forming therewith a parallel link device to permit up and down movement of and maintain the tool holder in parallelism with said vertical axis, and means having an operative connection
90 from said fixed vertical axis for maintaining the tool in fixed relation to a given line.

11. In a device of the kind described, a tool holder, a jointed swinging arm carrying said tool holder in its free end, said tool
95 holder being provided with a clamp at its lower end for detachably holding a tool in relatively unchangeable position with relation to the holder, and means for automatically turning the tool and tool
100 holder as the jointed arm is swung, so as to maintain the tool normally parallel to a given line, said clamp consisting of a spring depressed sleeve to engage the top of the tool, a headed stem for engaging the under
105 side of the tool, said stem entering through said sleeve, and a locking device for locking the stem and sleeve in relatively clamped position to the tool and to the rest of the holder.

12. In a device of the kind described, a tool holder, a jointed swinging arm carrying said tool holder in its free end, said tool
holder being provided with a clamp at its lower end for detachably holding a tool
115 in relatively unchangeable position with relation to the holder, and means for automatically turning the tool and tool holder as the jointed arm is swung, so as to maintain the tool normally parallel to a given
120 line, said clamp consisting of a spring depressed sleeve to engage the top of the tool, a headed stem for engaging the under side of the tool, said stem entering through said sleeve, a locking device for locking the stem
125 and sleeve in relatively clamped position to the tool and to the rest of the holder, and a hand-operated pin for releasing said locking device.

13. In a device of the kind described, a 130

supporting arm mounted to swing in a horizontal plane, a parallel ruler supporting member mounted on the free end of said arm to swing both horizontally and vertically with relation thereto, a vertical rotary shaft at the meeting ends of said two members, a similar shaft at the free ends of said parallel ruler supporting member, a tool holder carried at the lower end of the latter shaft, a pulley on each of said shafts mounted for universal movement with relation thereto, unyielding connection between said pulleys for actuating one by the other, means at the free end of said first mentioned supporting member for governing the axial position of the adjacent vertical shaft, and position-governing means at the opposite end of said first mentioned supporting member for controlling the position of said governing means.

14. In a device of the kind described, the combination with a tool holder, a jointed support therefor formed to permit universal movement of said holder over a table, and connections with adjusting mechanism for locating the tool in fixed definite relation to a given line irrespective of such movement, of a brake device arranged to render

certain of said parts rigid at will in any position desired.

15. In a device of the kind described, the combination with a tool holder, a jointed arm mounted to swing about a fixed vertical axis and to hold said tool holder in its free end, the inner part of said arm being rotatable about said vertical axis only and the outer tool holding part of said arm being rotatable about both horizontal and vertical axes located in the joint of said arm, of means for maintaining the tool carried by said tool holder at all times parallel to a given line, said means including a series of pulleys and pulley connections, the pulleys in the outer part of said arm being mounted for tilting adjustment on their axes so as to remain in parallelism with the outer part of said arm in its swinging vertical adjustments.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

CHARLES H. NICHOLS.

Witnesses:

WILFRED W. RUSS,
ADA E. LAMB.

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CHARLES H. NICHOLS.

Witnesses:

WILFRED W. RUSS,
ADA E. LAMB.

Correction in Letters Patent No. 1,055,785.

It is hereby certified that in Letters Patent No. 1,055,785, granted March 11, 1913, upon the application of Charles H. Nichols, of Haverhill, Massachusetts, for an improvement in "Templet Holding and Directing Machines," an error appears in the printed specification requiring correction as follows: Page 4, line 65, strike out the word "mounted"; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 22nd day of April, A. D., 1913.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.

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