D. T. WADHAMS.

CUTTING MACHINE.

APPLICATION FILED JULY 14, 1914.

1,195,538.

Patented Aug. 22, 1916.

2 SHEETS—SHEET 1.

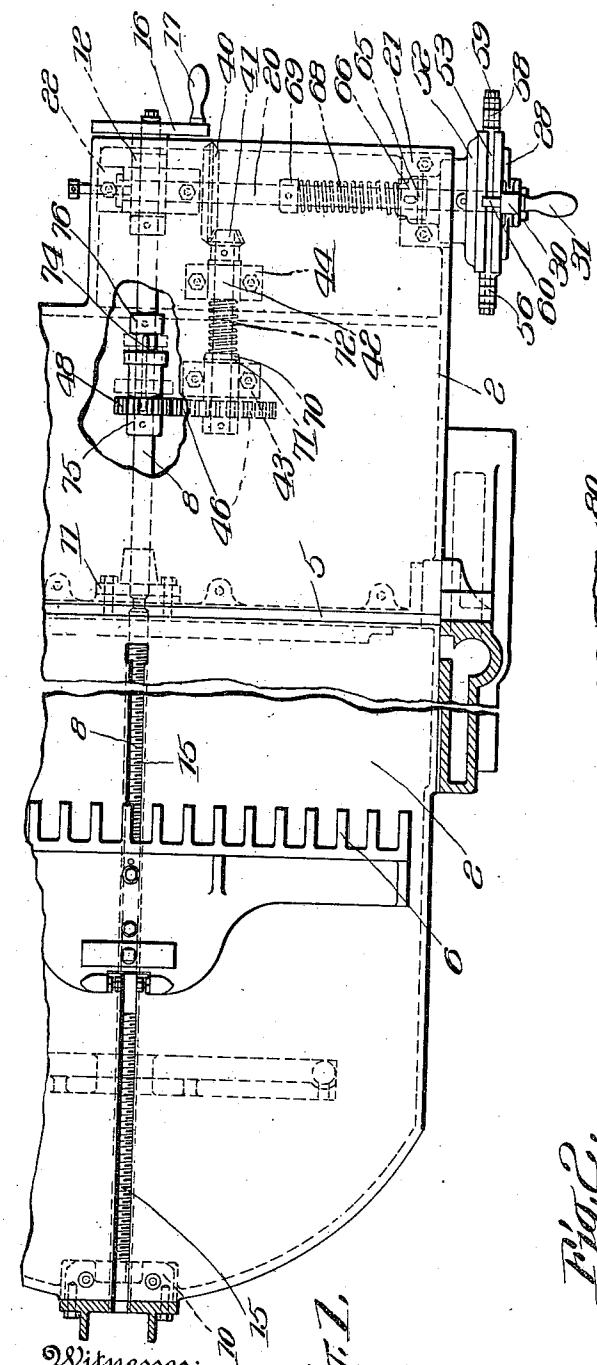


Fig. 1.

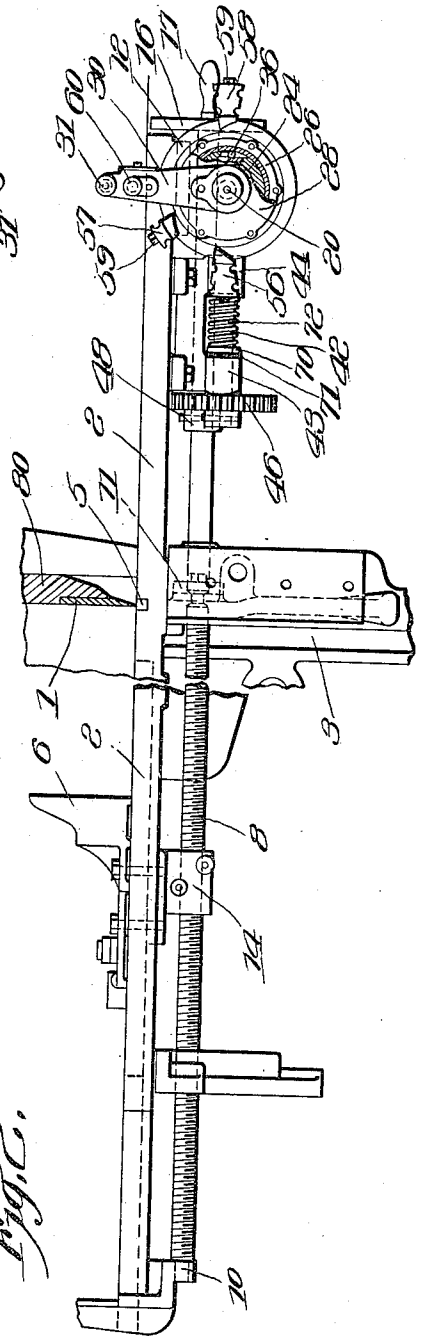


Fig. 2.

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2 SHEETS—SHEET 2.

Fig. 3.

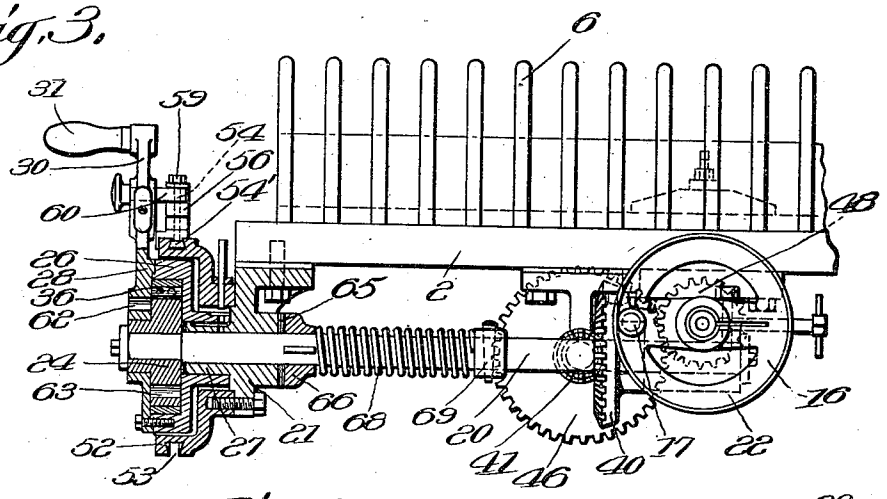


Fig. 4.

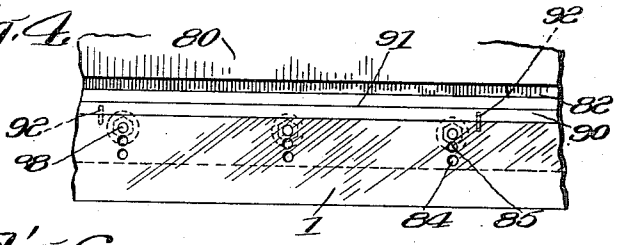


Fig. 5.

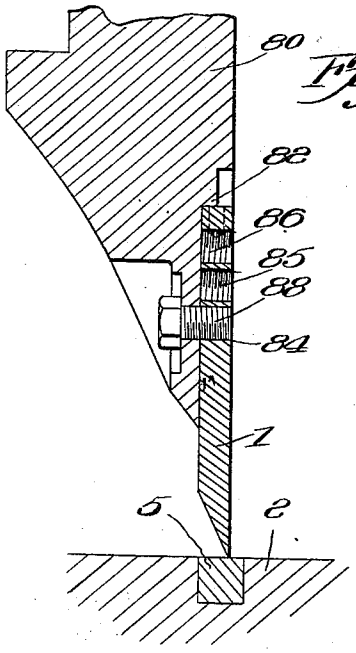


Fig. 6.

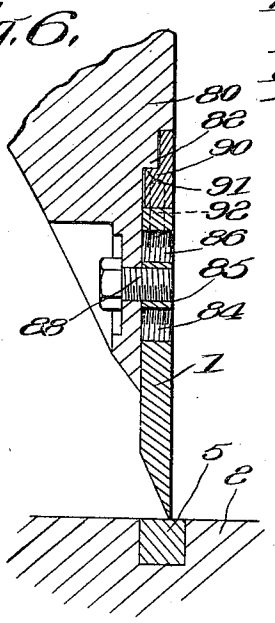
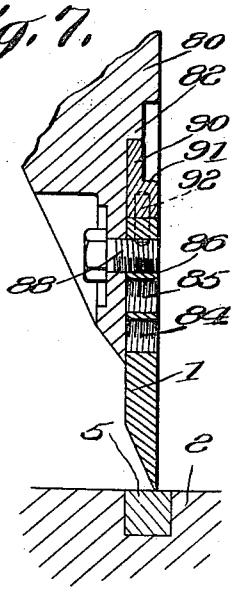


Fig. 7.



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UNITED STATES PATENT OFFICE.

DARIUS T. WADHAMS, OF OSWEGO, NEW YORK, ASSIGNOR TO NIEL GRAY, JR., OF OSWEGO, NEW YORK.

CUTTING-MACHINE.

1,195,538. Specification of Letters Patent. Patented Aug. 22, 1916.

Application filed July 14, 1914. Serial No. 850,890.

To all whom it may concern:

Be it known that I, DARIUS T. WADHAMS, a citizen of the United States, residing at Oswego, in the county of Oswego and State of New York, have invented new and useful Improvements in Cutting-Machines, of which the following is a specification.

This invention relates to cutting machines for the cutting of paper, cardboard, cloth, &c., and it consists in improved features of construction and arrangement designed particularly for readily adapting the machine for the cutting of different classes of work and for supporting the knife in an improved manner whereby added strength is given thereto. The former result is accomplished by the employment of an improved construction and arrangement of feeding and spacing mechanism designed for operating the back gage to advance the gage with successive, measured feed movements and wherein the spacing mechanism is conveniently disengaged from operative connection and without affecting the stops, thereby to permit of independently operating the gage in the usual manner when desired.

The improved support for the knife is acquired by the use of a backing plate therefor of peculiar form which is capable of backing up the knife in different positions thereby enabling the knife to be adjustably supported on its stock so as to compensate for the grinding down of the knife by the repeated sharpening thereof.

My improved arrangement provides for adjusting the knife to bring the cutting edge a proper distance from the knife-stock or bar and further provides for rigidly supporting the knife in its respective adjusted positions. The means employed is simple and efficient and is designed especially with a view to ease of adjustment.

The aforesaid and other features and advantages of my invention will hereinafter more fully appear and are shown in the accompanying drawings wherein like reference characters are applied to corresponding parts in the several views.

In the drawings a desirable embodiment of the features of my invention is shown wherein—

Figure 1 is a partial plan view of a cutting machine constructed in accordance with my invention. Fig. 2 is a partial side elevation thereof with portions in section. Fig. 3 is a partial front elevation with the spacing device shown in section. Figs. 4 to 7 illustrate my improved knife backing piece and manner of support, Fig. 4 showing the same in side elevation and Figs. 5, 6 and 7 illustrating in cross-section the three positions which the knife assumes and the manner of employing the backing piece therewith.

The machine as shown is especially adapted for the cutting up of the stock into small pieces a commercial use thereof being the cutting up of cloth for distribution as samples. I have heretofore devised a mechanism for this general purpose, disclosed in Patent No. 1,095,250 dated May 5, 1914 adapted for conveniently and accurately feeding the stock to the cutting position beneath the usual cutting knife.

The present invention consists in an improved arrangement and organization of the there described or similar mechanism so as to present further features of advantage in the mode of operation and in its relation to other features of the machine.

The machine in which my improved feeding and spacing mechanism is incorporated may be of any approved type having a suitable cutting mechanism of which it is sufficient for the purpose of illustration, to indicate the knife 1 as shown. The knife, as is well understood, operates vertically to cut the stock resting on the usual table 2, supported on the standard 3. The knife is arranged to cut into the usual co-acting cutting stick 5 and the work is advanced thereto into cutting position by the usual back gage 6 arranged to slide relative to the knife on the rearward extension of the table which is of any desired length.

As here shown, the gage is moved under the action of an elongated screw 8 journaled in suitable bearings, here shown as a rear bearing 10, a central standard bearing 11 and a front bearing 12; the front and rear bearings being secured to the under surface of the table 2. The screw is connected to the gage by passing through a lug 14 depending from the gage through an elongated slot

15 in the table. The lug 14 is interiorly threaded to receive the thread of the screw so that upon turning the screw the gage is caused to ride either forwardly or backwardly. For the purpose of directly actuating the screw a hand wheel 16 is affixed to the projecting front extremity of the screw as shown and provided with a handle 17.

My improved actuating and spacing device provides for imparting a suitably increased movement to the feed screw so as to obtain the desired progressive feed movements of the gage when actuated thereby. It also allows the gage to be moved independently thereof when desired. In accordance with my improved arrangement the spacing device is mounted upon a feed shaft 20 journaled in suitable bearings 21—22 on the under side of the table. This spacing device as shown is designed to be quickly responsive and accurate in its operation and consists of a roller ratchet 24 keyed on the outer end of the feed shaft 20 at the left hand side of the machine. The ratchet 24 is inclosed within an operating case 26 having a journal bearing on the flange 27 of the bearing bracket 21 and this operating case 26 has attached thereto by suitable bolts the cover 28 provided with an operating crank 30 having a handle 31. The ratchet disk 24 is shown formed to provide a bearing for the cover 28.

As best shown in Figs. 2 and 3 to produce the progressive forward movement of the feed shaft, rollers 36, fitted within peripheral notches in the ratchet disk, are interposed between the disk member and the operating case 26 in a manner to couple them to move together on the forward or feeding movement and to permit the operating case to be moved rearwardly independent of the disk on the return movement. The movement thus imparted to the feed shaft 20 is communicated to the feed screw 8 for advancing the gage by the engagement of a bevel gear 40 on the feed shaft with a smaller similar pinion 41 on a counter shaft 42 supported in suitable bearings 43—44 in parallel relation to the feed screw 8. Upon the opposite end of this counter-shaft 42 is affixed a large spur pinion 46 to engage a smaller pinion 48 slidably keyed on the gage screw 8. As the pinions 41 and 48 are much smaller than the pinions 40 and 46 by which they are actuated the feed movement transmitted to the screw 8 from the feed shaft is correspondingly increased.

When the gage is so operated through the feed shaft 20 means are provided to then limit the reciprocal movement of the crank 30 and operating case to determine the extent of each feed movement. To that end stops for limiting the feed movement of the operating case are mounted upon a stop-holder 52 rigidly secured on the stationary bracket 21. The stop holder 52 is formed on its periphery with an annular dove-tailed groove 53 into which bolt-heads 54′, formed complemental to the groove, are fitted. The shanks of the bolts 54 extend radially and support adjustable stops 56—57 and 58 and have threaded on their ends nuts 59 by which the stops are rigidly clamped onto the holder in their adjusted position. For correctly setting the stops the face of the holder 52 is suitably graduated. A pin 60 is carried by the crank arm 30 to co-act with the stops by engagement therewith to limit the movement of the crank and consequently the feed movement transmitted to the gage therefrom through the connections described. As shown the pin 60 may be inserted in suitable apertures in the crank arm to coact with any two of the three stops as desired thereby to limit the feed movements for both widths and lengths in the manner fully described in the patent hereinbefore referred to. The pin may also assume a position in aperture 62 to engage a registering aperture 63 in the ratchet disk so that the feed shaft 20 may be rotated in both directions by means of the crank.

As shown in Figs. 1 and 3, suitable friction washers 65 are interposed between the stationary bracket 21 and a collar 66 slidably keyed on the feed shaft 20 and a spring 68 is confined between the collar 66 and a fixed collar 69 secured on the shaft to exert an endwise pressure on the former collar 66 to press it into frictional engagement with the washers 65. The function thereof is to insure of the binding rollers releasing instantly without disturbing the back gage or taking up any looseness in the connections. A similar arrangement of friction washers and spring pressed collar is provided on the counter-shaft 42 where as shown a sliding collar 70 is pressed against washers 71, interposed between it and the bracket 43 by a spring 72 confined between the collar 70 and the bracket 44.

As described, in my improved arrangement the pinion 48 is slidably keyed on the feed screw 8 by means of an elongated key 74. Thus it is permitted to be longitudinally displaced on the feed screw out of position of engagement with the pinion 46 as shown in dotted lines Fig. 1. Stop collars 75—76 are provided to limit the movement of the pinion. Thus provision is made for operating the gage directly by means of hand wheel 16 independently of the spacing device which is desirable at times other than when cutting the uniform sizes for which the spacing device is designed.

A further important feature of my invention resides in a desirable manner of adjusting the knife upon the knife-stock or knife-

bar, by which it is carried, thereby to compensate for the wearing away of the knife after repeated sharpenings and in an improved backing piece of simple form adapted to be positioned so as to rigidly support or back-up the knife in a plurality of positions. By my improved arrangement the knife is solidly backed up in all positions.

In practice it is essential that the cutting edge of the knife be suitably distanced below the knife-bar so that the knife-bar will not engage the work and interfere with the cutting operation and my improved arrangement is devised particularly with a view to maintaining the desired distance of the cutting edge from the bar and for that purpose provides for shifting the position of the knife as it wears down, to maintain the proper spacing.

My improved arrangement is shown in Figs. 4 to 7 wherein as shown the knife stock 80 is shown suitably recessed to receive the knife blade 1 and to provide a backing shoulder 82 therefor in its initial position as indicated in Fig. 5. The knife as shown is drilled and tapped to provide three rows of threaded apertures 84—85—86 to receive the securing screws 88 fitted to apertures in the knife-bar 80 whereby it is secured thereto in either of the respective positions of Figs. 5, 6 and 7. Thereby the knife can be shifted into a lowered position as it wears down so as properly to position the cutting edge thereof. When the knife is new it is located in the position of Fig. 5 with the screw 88 threaded to apertures 84 and the top edge of the knife backed up by abutting the shoulder 82 of the knife-bar 80. As the knife is ground down it is shifted to the position of Fig. 6 and a backing-piece 90 of the form shown is inserted in position with its shoulder 91 in engagement with the aforesaid knife-bar shoulder 82. The backing-piece then acts to provide a solid backing for the knife which is now held in position by the screws 88 entering apertures 85. As the knife is further ground down it is shifted to the position of Fig. 7, or lowermost, position, with the securing screws 88 threaded into apertures 86. By reversing the position of the backing piece 90 it is adapted to then assume a second backing position, as shown, with its upper edge in engagement with backing shoulder 82 of the knife-bar so that a solid backing is provided for the knife. Dowel pins 92 are desirably fixed in the backing piece to enter apertures in the upper edge of the knife for joining together the knife and backing piece and hold the latter in position.

By the described arrangement the knife is adjustable to a degree permitting of a considerable saving in the expense of renewing the knives and the knife is backed up solid at all times. Moreover the knife edge is at no time extended below the bar an excessive distance which would occur were the knife located in a fixed position and made wide enough to allow the same amount of grinding to be done. A knife so arranged owing to its large unsupported area would not possess the required rigidity for accurate cutting. Thus my improved arrangement provides for the maximum of grinding while at all times rigidly supporting the knife both laterally and vertically. Furthermore incidental to the desirable simple form of the backing piece provided with dowels entering the knife apertures, the backing piece is assembled with the knife to form one piece and is secured in position by the knife securing screws 80 thereby eliminating additional securing parts therefor. And as described the single backing piece is of peculiar form to coact with the knife bar in two positions for rigidly backing up the knife in two positions of adjustment.

Having described my invention, I claim:

1. In a paper cutting machine, the combination with the frame and a table for the work thereon, of a knife, a movable gage for advancing the work to the knife, an actuating screw therefor, an operating lever on the screw, work advancing mechanism, an actuating member therefor, coupling means to effect the coupling of the advancing mechanism and the actuating member to move together in one direction and adapted to permit an independent return movement of the actuating member, means to limit the movement of the actuating member for measuring the feed movements and means for transmitting the movement of the advancing mechanism to the actuating screw, said latter means being capable of being disengaged to permit of the screw being operated independently by its operating lever substantially as described.

2. In a paper cutting machine, the combination with the frame and a table for the work thereon, of a knife, a movable gage for advancing the work to the knife, an actuating screw therefor, an operating lever on the screw, work advancing mechanism, an actuating member therefor, coupling means to effect the coupling of the advancing mechanism and the actuating member to move together in one direction and adapted to permit an independent return movement of the actuating member, means to limit the movement of the actuating member for measuring the feed movements and gear connections for transmitting the movement of the advancing mechanism to the actuating screw with a suitably increased movement and said gearing being capable

of being disengaged to permit of the screw being operated independently by its operating lever substantially as described.

3. In a paper cutting machine, the combination with the frame and a table for the work thereon, of a knife, a movable gage for advancing the work to the knife, an actuating screw therefor, an operating lever on the screw, work advancing mechanism, an actuating member therefor, coupling means to effect the coupling of the advancing mechanism and the actuating member to move together in one direction and adapted to permit an independent return movement of the actuating member, means to limit the movement of the actuating member for measuring the feed movements and connections for transmitting the motion from the advancing mechanism to the actuating screw comprising an actuating shaft journaled at right angles to the actuating screw, a counter shaft journaled parallel to the screw, miter gears connecting the shafts, a spur gear on the counter shaft and a gear slidably keyed on the actuating screw adapted to engage the spur gear for actuating the screw by the advancing mechanism and to be shifted out of engagement to permit of independently operating the screw by its operating lever.

4. In a paper cutting machine, the combination with the frame and a table for the work thereon, of a knife, a movable gage for advancing the work to the knife, an actuating screw therefor suitably journaled, an operating lever on the screw, work advancing mechanism, an actuating member therefor, coupling means to effect the coupling of the advancing mechanism and the actuating member to move together in one direction and adapted to permit an independent return movement of the actuating member, means to limit the movement of the actuating member for measuring the feed movements, gear connections for transmitting the motion from the advancing mechanism to the gage comprising an actuating shaft journaled at right angles to the screw, a counter shaft journaled parallel to the screw, gear connections therebetween, a large gear on the counter shaft, a co-acting smaller gear slidably keyed on the actuating screw for transmitting the motion from the advancing mechanism thereto and adapted to be shifted out of engagement to permit of independently operating the screw by the operating lever, friction collars keyed on the shafts and springs arranged to produce frictional holding pressure between the collars and a stationary part substantially as described.

5. A cutting machine having a supporting frame, a suitable table for supporting the work to be cut, a knife supporting bar, a knife arranged to be supported in a plurality of positions, a backing piece therefor adapted to be interposed between the bar and the knife in a plurality of positions for solidly backing up the knife throughout its length and engaging means between the knife and the backing piece for removably clamping the backing piece in position upon securing the knife to the bar.

6. A cutting machine having a supporting frame, a suitable table for supporting the work to be cut, a knife supporting bar formed to provide a backing shoulder, means for securing the knife to the bar in a plurality of positions and a backing piece adapted to be interposed between the knife and the backing shoulder for solidly backing up the knife, said backing piece being provided with a plurality of opposing shoulders for engaging the bar shoulder in reversed positions for differently spacing the knife.

7. A cutting machine having a supporting frame, a suitable table for supporting the work to be cut, a knife supporting bar formed to provide a backing shoulder for the knife in its initial position, means for securing the knife to the bar in a plurality of positions, and a backing piece adapted to be interposed between the knife and the backing shoulder for solidly backing up the knife and provided with a plurality of opposing shoulders for engaging the bar shoulder in different positions of adjustment.

8. A cutting machine having a supporting frame, a suitable table for supporting the work to be cut, a knife supporting bar formed to provide a backing shoulder for the knife in its initial position, means for securing the knife to the bar in a plurality of positions, a backing piece adapted to be interposed between the knife and the backing shoulder for solidly backing up the knife and provided with opposing shoulders for engaging with the bar shoulder in reversed positions for differently spacing the knife and engaging means between the knife and the backing piece whereby the latter is held in position by the knife securing means.

9. A cutting machine having a supporting frame, a suitable table for supporting the work to be cut, a knife supporting bar formed to provide a backing shoulder for the knife, said knife being tapped with a plurality of threaded apertures for securing the knife in a plurality of positions, securing bolts carried by the supporting bar and entering said apertures for clamping the knife in position thereon, a backing piece adapted to be interposed between the knife

and the backing shoulder for solidly backing up the knife and provided with opposing shoulders for engaging with the bar shoulder in reversed positions for differently spacing the knife and equally spaced dowel pins carried by the backing piece to project downwardly therefrom into registering apertures in the knife whereby the backing piece is held in its respective positions by the knife securing bolts substantially as described.

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

DARIUS T. WADHAMS.

Witnesses:
JAS. P. KANE,
F. K. BARNHART.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."