No. 863,007. PATENTED AUG. 13, 1907.

C. A. STURTEVANT.

CUTTER MECHANISM FOR SHEET FOLDING AND OTHER MACHINES.

APPLICATION FILED AUG. 31, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

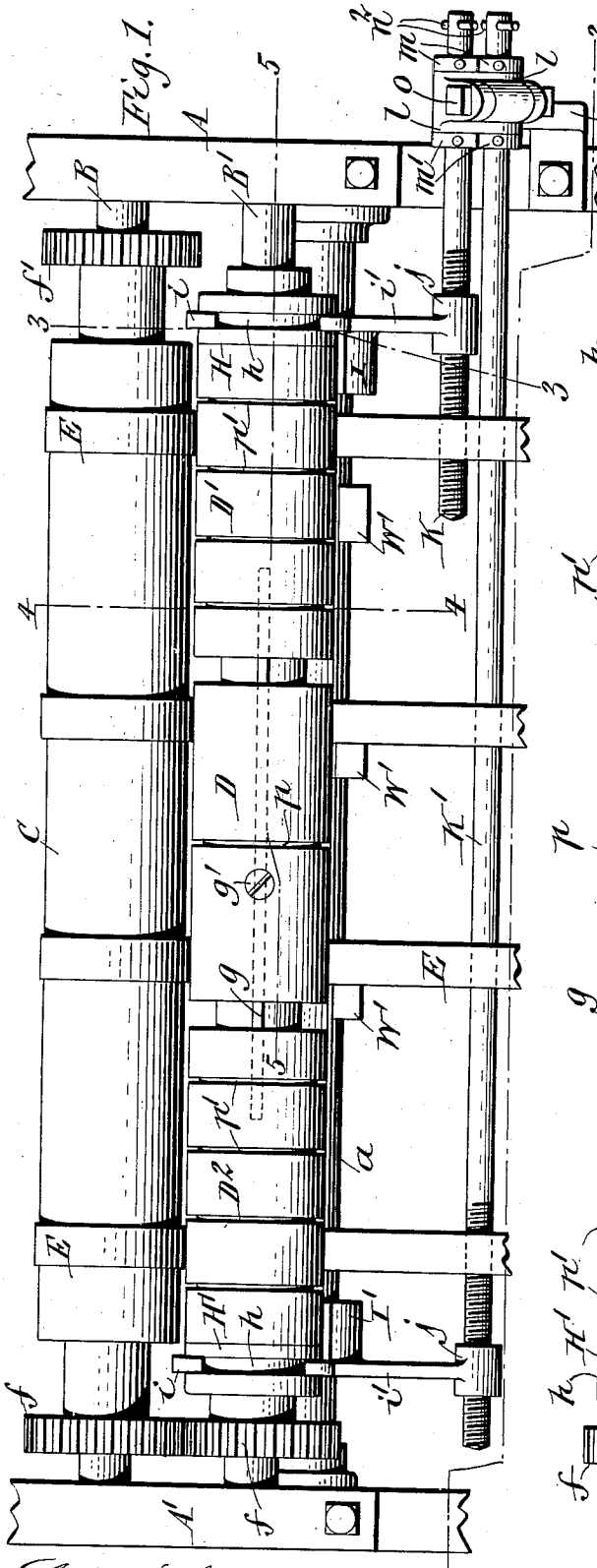
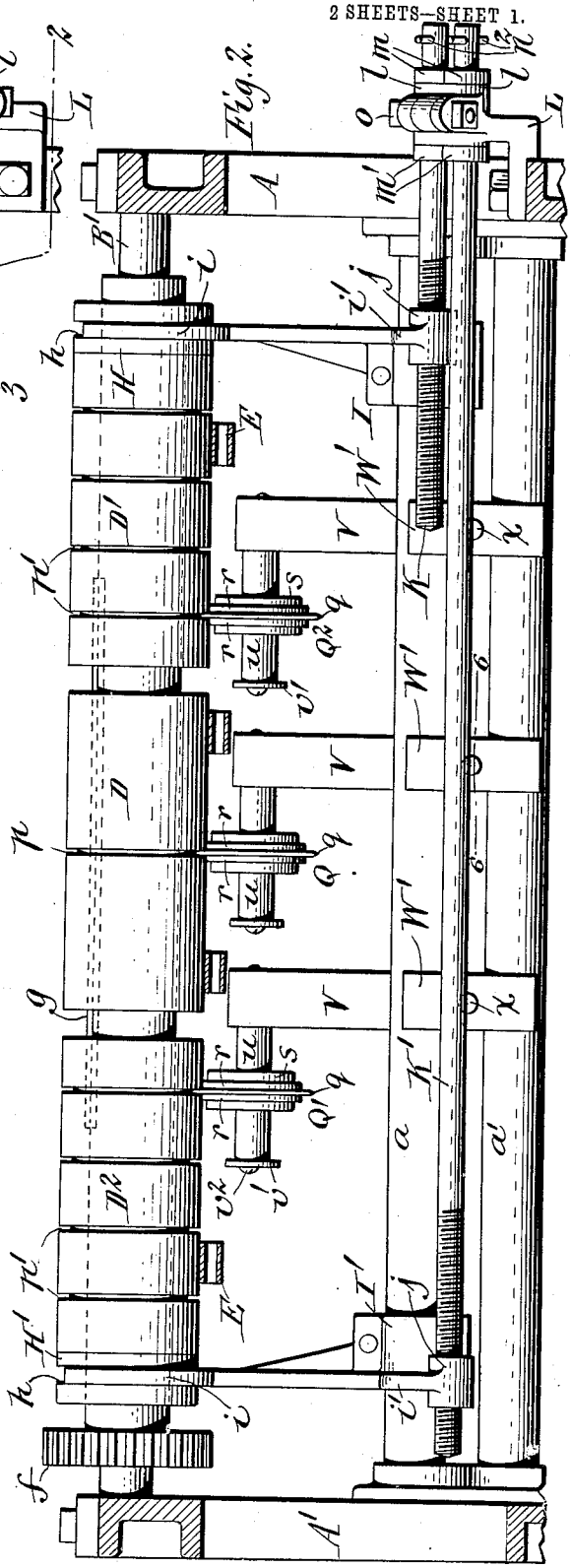


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

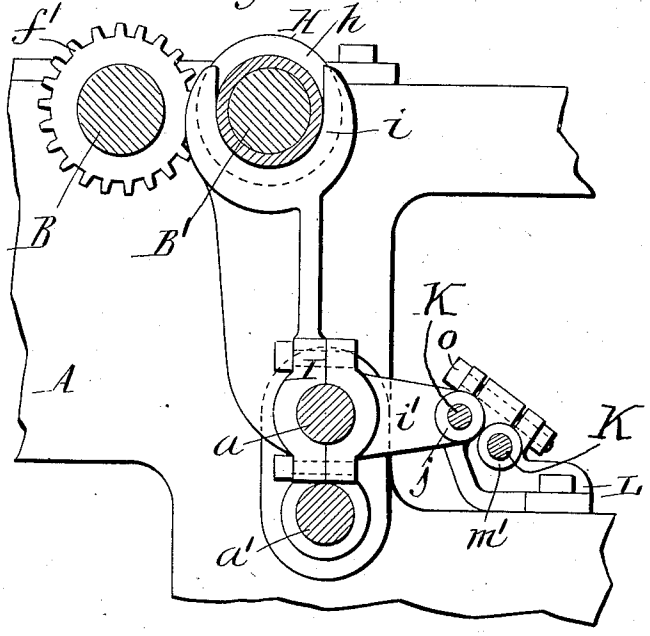


Fig. 4.

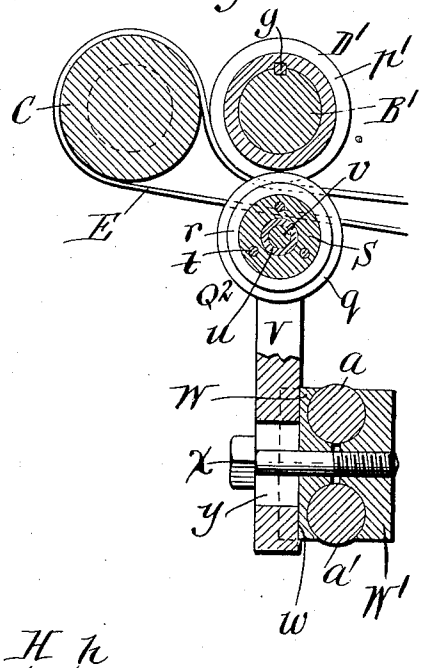


Fig. 5.

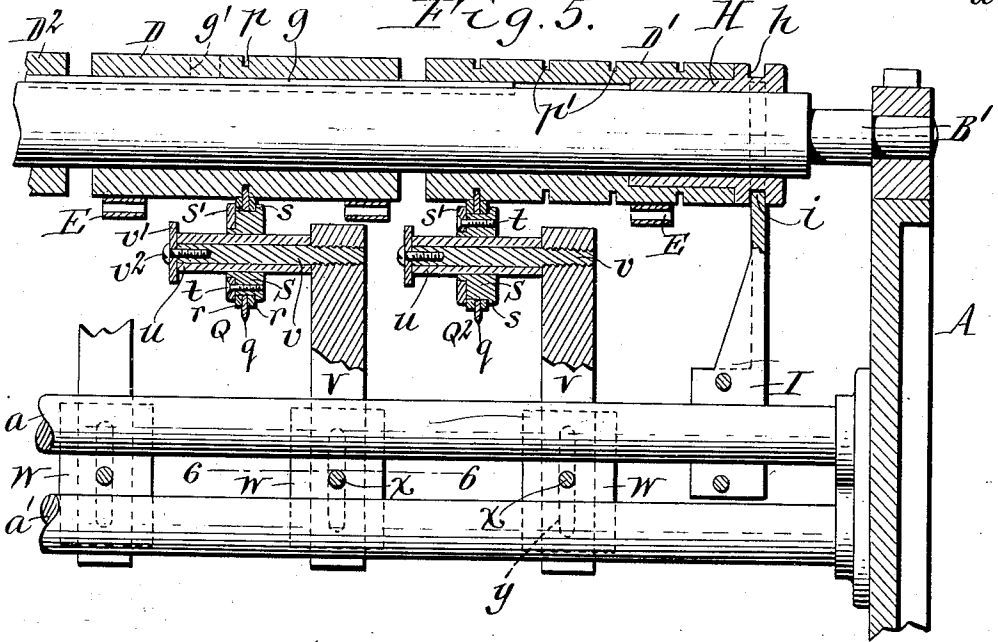


Fig. 6.

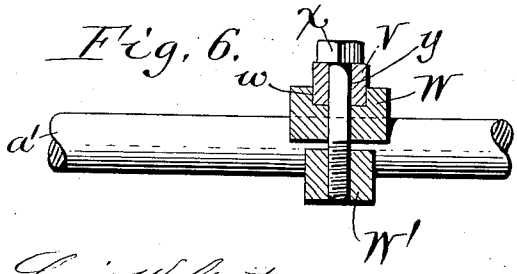
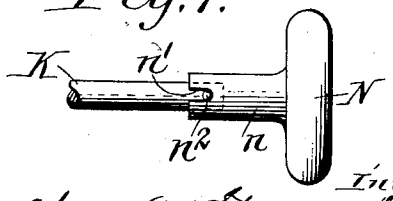


Fig. 7.



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UNITED STATES PATENT OFFICE.

CHARLES A. STURTEVANT, OF PLAINFIELD, NEW JERSEY, ASSIGNOR TO E. C. FULLER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

CUTTER MECHANISM FOR SHEET-FOLDING AND OTHER MACHINES.

No. 863,007. Specification of Letters Patent. Patented Aug. 13, 1907.

Application filed August 31, 1905. Serial No. 276,548.

To all whom it may concern:

Be it known that I, CHARLES A. STURTEVANT, a citizen of the United States, residing at Plainfield, in the county of Union and State of New Jersey, have invented new and useful Improvements in Cutter Mechanism for Sheet-Folding and other Machines, of which the following is a specification.

This invention relates to a cutter mechanism which is applicable to sheet folding and other machines for slitting or dividing the sheets into a plurality of sections while in transit.

The object of this invention is the provision of a cutter mechanism for this purpose which is simple in construction and effective in operation and which can be readily adjusted for cutting the sheets into sections of different widths.

In the accompanying drawings consisting of two sheets; Figure 1 is a fragmentary top plan view of a folding machine equipped with my improved cutter mechanism. Fig. 2 is a vertical longitudinal section of the same taken in line 2—2, Fig. 1. Figs. 3 and 4 are vertical transverse sections taken in lines 3—3 and 4—4, Fig. 1 respectively. Fig. 5 is a fragmentary longitudinal sectional elevation in line 5—5, Fig. 1. Fig. 6 is a fragmentary horizontal section in line 6—6 Fig. 5 showing the means for adjustably securing a cuttert to the main frame. Fig. 7 is a fragmentary view showing the detachable handle of the cutter adjusting mechanism.

Similar letters of reference indicate corresponding parts throughout the several views.

The main frame of the machine may be of any suitable construction that shown in the drawings consisting of two vertical standards or end pieces A A^1, and two longitudinal rods or bars a a^1, arranged parallel and horizontally one above the other and connecting the end pieces. Above the longitudinal bars are arranged two shafts B B^1 which are arranged horizontally side by side and which are journaled in suitable bearings on the standards of the frame. The front shaft B has rigidly secured thereto a front roller C which is continuous throughout its length and which coöperates with a roller on the rear shaft B^1 which is composed of sections D D^1 D^2. These rollers preferably serve as part of the mechanism whereby the sheet which is to be divided is also folded or otherwise operated upon. The sheet to be folded and slitted is fed down between the opposing rollers B B^1 by any suitable means and carried underneath the rear roller sections to the devices which subsequently operate upon the same by means of tapes E passing over the front roller and underneath the sections of the rear roller.

The two shafts are caused to rotate in unison by means of intermeshing gear wheels f f secured to corresponding ends thereof and the same are operatively connected with drive mechanism of any suitable construction by a gear wheel f^1 on the front shaft. The central section D of the rear roller is rigidly secured to the central part of the rear shaft by means of a key g and a set screw g^1 or by any other means but the end sections D^1 D^2 which are mounted upon the rear shaft on opposite sides of the central section, are compelled to turn with the shaft but are capable of longitudinal movement thereon. This is preferably effected by constructing the ends of the key g in the form of splines or feathers and extending the same into longitudinal ways or grooves in the bore of the end sections, as shown in Figs. 1, 2 and 5, thereby forming splined or feathered connections between the rear shaft and the end sections of the rear roller.

Various means may be employed for adjusting the end sections of the rear roller lengthwise on the rear shaft. The means for this purpose shown in the drawings are constructed as follows:

H H^1 represent bushings which are secured in the outer ends of the end roller sections by a driving fit or otherwise and each of which is provided with an annular groove h in its periphery.

I I^1 represent two yokes or slides which are mounted on the upper horizontal bar a so as to be movable lengthwise thereon and each of which is provided at its upper end with a fork i which engages with the groove of one of said bushings. On the rear sides of these yokes or slides the same are provided with laterally projecting arms i^1 each of which carries a screw nut j at its rear end the axis of which is parallel to the supporting bars a a^1 and the rear shaft.

K K^1 represent two adjusting screws which are arranged horizontally side by side and parallel to the supporting bars and rear shaft. These screws have their inner or rear ends screw threaded and one of them k is comparatively short and engages its screw threaded rear end with the screw nut of the front slide I while the other k^1 engages its screw threaded rear end with the screw nut of the rear slide I^1 this being possible by making the arm i^1 of the rear slide somewhat longer than the front slide, as shown in Fig. 1. The front or outer ends of the adjusting screws extend to the outer side of the frame standard A and the same are held against lengthwise movement but are capable of rotating freely. This is effected by journaling the front portions of these screws in bearings l l formed on a bracket L which is secured to the standard A and arranging shoulders or collars m m^1 on said screws on opposite sides of their bearings. Upon turning the screws in one direction or the other the slides connected therewith are caused to move lengthwise of the screws and the respective roller sections are caused to move lengthwise on the rear shaft owing to the slides and bushings which connect these parts.

The adjustment of each screw may be effected in any suitable manner but preferably by means of a handle N, having its hub n constructed to fit over the outer end of the screw and provided with notches n^1 which receive a transverse pin n^2 at the outer end of each screw. By this means the handle can be readily attached to a screw when required and removed therefrom when not in use so that there is no unnecessary projection from that part of the machine after the same has been set.

After adjustment the screws are held against turning so as to avoid accidental displacement of the end roller sections D^1 D^2 by splitting the bearings l l thereof and connecting the split portions of the same by means of a clamping screw o.

The central section of the rear roller is provided midway in its periphery with a single circumferential or annular groove p but each of the end sections of this roller is provided with a plurality of such grooves which are preferably arranged equidistant, as shown at p^1 Figs. 1, 2 and 5.

Q Q^1 Q^2 represent rotary cutters which coöperate with the sections of the rear roller for severing the sheet which passes between the same into a plurality of sections. Each of these cutters is constructed as follows:

q represents an annular cutter blade or ring arranged underneath one of the roller sections and projecting with the upper part of its peripheral cutting edge into a groove of said roller section. This cutter blade is arranged between two supporting rings r r the bore of which is of the same diameter as that of the cutter blade but the periphery thereof is of smaller diameter than the cutter blade so as to leave the peripheral or cutting edge of the blade projecting beyond the supporting rings and form shoulders on opposite sides of said cutter blade which engages with the roller section on opposite sides of the groove with which the cutter blade engages. The blade together with the supporting rings is mounted on the periphery of a hub S and is confined thereon against axial movement by means of a rigid flange or shoulder s formed on the hub and bearing against one of the supporting rings and a detachable annular shoulder or disk s^1 which bears against the other supporting ring and is connected with the hub by means of screws t or otherwise. This hub is journaled upon a bearing sleeve or bushing u which is arranged horizontally or parallel to the rear shaft and is of a length greater than that of the cutter hub so as to form an elongated bearing on which the cutter can move lengthwise. This bushing or sleeve is in turn journaled upon a horizontal arbor v which is secured at one end to the upper end of a supporting bracket V preferably by screwing the respective end of said arbor into a threaded opening in said bracket, as shown in Fig. 5. One end of the bearing sleeve u bears against the bracket V while its opposite end bears against a disk or head v^1 secured to the opposite end of the arbor by means of a screw v^2 whereby this sleeve or bushing is held against axial movement relatively to the arbor and bracket.

The lower end of each of the brackets V is fitted in a vertical groove w formed in a clamping block W which is suitably recessed on its opposite side to fit one side of both frame bars, a a^1. A similar clamping block W but having no vertical groove w is fitted in like manner against the opposite side of said frame bars a a^1. These two clamping blocks are fastened against the opposite sides of the frame bars and the respective bracket V is adjustably secured to the grooved clamping block by means of a clamping bolt x connecting said blocks between said bars and passing through a vertical slot y in said bracket, as shown in Figs. 4, 5 and 6. This connection between the bracket V and the frame permits the bracket and the parts mounted thereon to be adjusted toward and from the adjacent rear roller section and also adjusted lengthwise thereof.

In setting up the machine a cutter of this description is placed with its blade or cutting ring into the groove of the central roller section and its bracket V is secured by means of the companion clamping blocks and screw to the adjacent part of the frame bars a a^1. A cutter placed in this position operates to divide the sheets centrally between its side edges and is used exclusively when the sheet is to be divided into not more than two sections. When the sheet is to be cut into 4 sections two similar cutters are arranged on opposite sides of the central cutter and each fitted with its cutting blade into one of the grooves of the respective end roller sections and secured with its standard to the adjacent part of the frame bars a a^1, as shown in Figs. 1 and 2. The cutting blades of the side cutters are engaged with those grooves of the end roller sections which are nearest the line on which it is proposed to sever the sheets. A coarse adjustment only of these side cutters is effected by this means. In order to effect a fine adjustment of the side cutters and place them exactly in register with the lines where the sheet is to be severed the screws K K^1 are turned in the proper direction for shifting the end roller sections on the rear shaft. During this movement of these roller sections the companion cutters are also moved axially on their bearings by reason of the sides of the grooves containing the cutting blades operating as shoulders which engage the sides of the blades and cause them to move axially with the roller sections. During this adjusting movement of the side cutters the brackets V and the elongated bearings thereof remain stationary whereby the fine adjustment is limited to the length of these bearings.

When the sheet is to be cut into 3 sections the central cutter is omitted and the side cutters adjusted accordingly.

Inasmuch as the central cutter and its coöperating central roller section usually do not require any adjustment this cutter could be journaled on a fixed pivot. It is preferable, however, to construct this cutter in all respects like the side cutters which require to be adjusted as this reduces the number of different parts which have to be made thus effecting a saving in the cost of manufacturing the machine.

As the sheets pass downwardly between the front and rear rollers and between the latter and the cutter blades the same are severed into a plurality of sections according to the number and position of the cutters which are employed.

My improved cutter adjustment is not only very convenient as the same permits of making the fine adjustment of the cutter while the machine is running and without the necessity of reaching into the inner part of the machine, but the same also effects a saving in time when getting the machine ready thus increasing the out put of the machine.

I claim as my invention:—

1. A cutter mechanism for sheet folding and other machines comprising a shaft, a roller splined on said shaft and having an annular groove in its periphery, an annular cutter projecting into said groove and capable of axial movement with said roller, a bushing secured to said roller and having an annular groove, a slide having a fork which engages with the groove of said bushing, an adjusting screw engaging at its threaded end with a nut on said slide, a split bearing in which the opposite end of said screw is journaled a clamping screw connecting the split parts of said bearing, and collars or shoulders arranged on said screw on opposite sides of said bearing, substantially as set forth.

2. A cutter mechanism for sheet folding and other machines comprising a shaft, roller sections splined on said shaft and each provided with an annular groove, independent devices for adjusting said rollers axially on said shaft, cutter disks engaging with said grooves and each adapted to be moved axially together with its companion roller solely by engagement of the sides of the respective groove with the sides of the disk, substantially as set forth.

3. A cutter mechanism for sheet folding and other machines comprising a shaft, roller sections splined on said shaft and each provided with an annular groove, cutter blades projecting into said grooves and movable bodily with said sections, slides operatively connected with said sections, and two adjusting screws which are arranged side by side and one of which is short and engages with a nut on one of said slides while the other is long and engages with a nut on the other slide, substantially as set forth.

4. A cutter mechanism for sheet folding and other machines comprising a shaft, roller sections splined on said shaft and each provided with an annular groove, cutter blades projecting into said grooves and movable bodily with said sections, slides operatively connected with said sections, two adjusting screws arranged side by side and having their front ends adjacent to each other and one of which is short and engages its threaded rear end with a nut on one of said slides while the other screw is long and engages its threaded rear end with a nut on the other slide, and bearings in which the front ends of said screws are journaled but held against axial movement, substantially as set forth.

5. A cutter mechanism for sheet folding and other machines comprising a shaft, a roller composed of a central section which is fixed on said shaft and has an annular groove, and two end sections which are splined on said shaft on opposite sides of said central section and each having an annular groove, cutter blades projecting into said grooves, and means for adjusting said end sections and the companion cutter blades toward and from said central sections and its cutter blade, substantially as set forth.

6. A cutter mechanism for sheet folding and other machines comprising a shaft, a roller composed of a central section which is fixed on said shaft and has an annular groove, and two end sections which are splined on said shaft on opposite sides of said central section and each having an annular groove, cutter blades projecting into said grooves, and means for adjusting said end sections and the companion cutter blades toward and from said central section and its cutter blade, comprising slides operatively connected with said end sections and one slide having a short arm and the other a long arm, and adjusting screws which are arranged side by side and one of which is short and engages with a nut on said short arm while the other is long and engages with a nut on said long arm, substantially as set forth.

7. A cutter mechanism for sheet folding and other machines comprising a longitudinally movable roller having an annular groove, a rotary cutter having a blade projecting into said groove, a bushing upon which said cutter is capable of sliding axially, an arbor upon which said bushing is mounted, a bracket supporting one end of said arbor and engaging with one end of said bushing, and a head secured to the opposite end of said arbor and engaging with the opposite end of said bushing, substantially as set forth.

8. A cutter mechanism for sheet folding and other machines comprising a longitudinally movable roller having an annular groove, a rotary cutter having a blade projecting into said groove, a bearing on which said cutter is mounted a bracket supporting said bearing, a pair of supporting rods, clamping blocks bearing against opposite sides of said rods and one of them having a vertical guide groove which receives said bracket, and a clamping bolt connecting said blocks and bracket and passing through a vertical slot in the latter, substantially as set forth.

Witness my hand this 29 day of Aug., 1905.

CHARLES A. STURTEVANT.

Witnesses:
E. E. BUSH,
C. H. BIERLEIN.