No. 864,496. PATENTED AUG. 27, 1907.

L. N. D. WILLIAMS & H. SWINGLEHURST.

CIRCULAR KNITTING MACHINE.

APPLICATION FILED MAY 29, 1903.

3 SHEETS—SHEET 1.

Fig. 1.

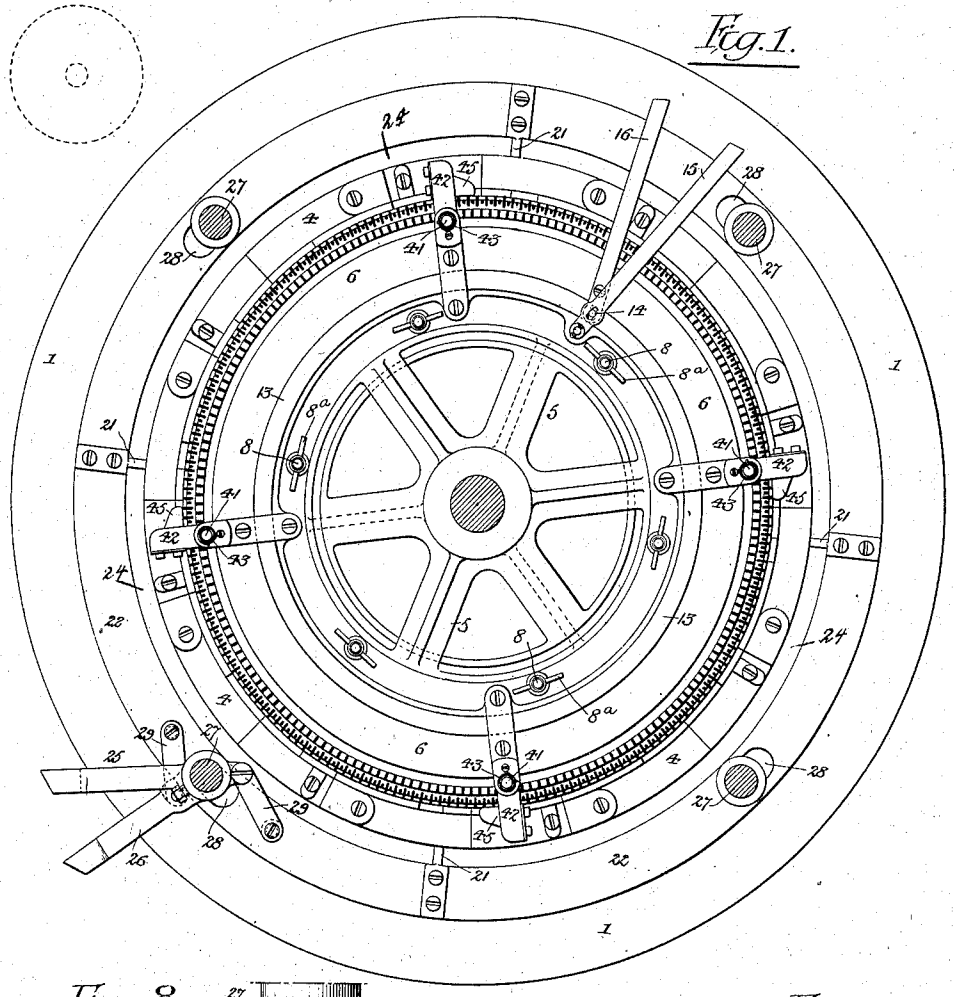


Fig. 8.

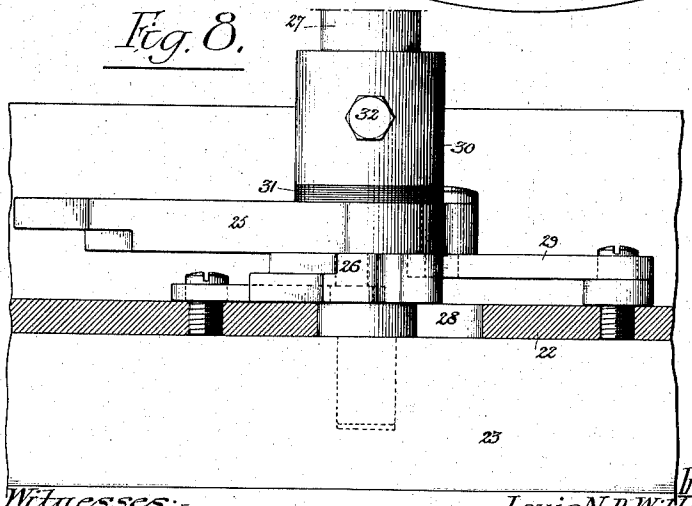
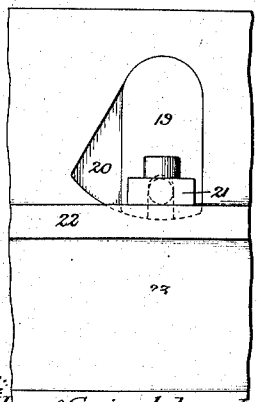


Fig. 9.



Witnesses:-
Hamilton D. Turner
Herman E. Metius

Inventors:
Louis N. D. Williams & Harry H. Swinglehurst,
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3 SHEETS—SHEET 2.

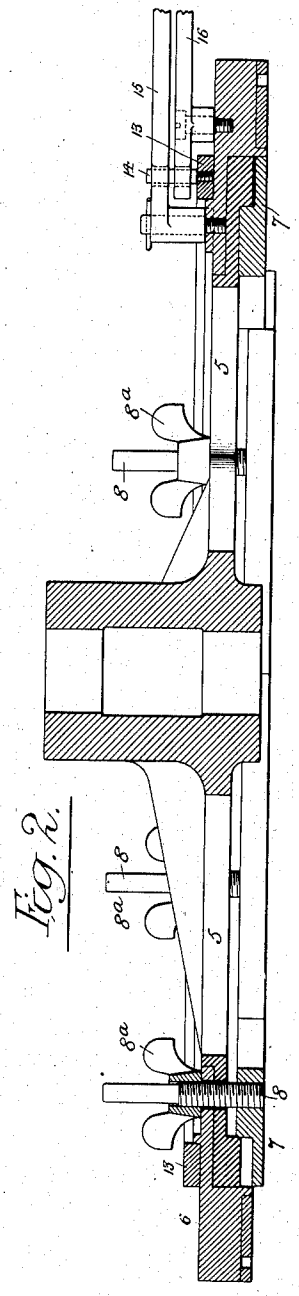


Fig. 2.

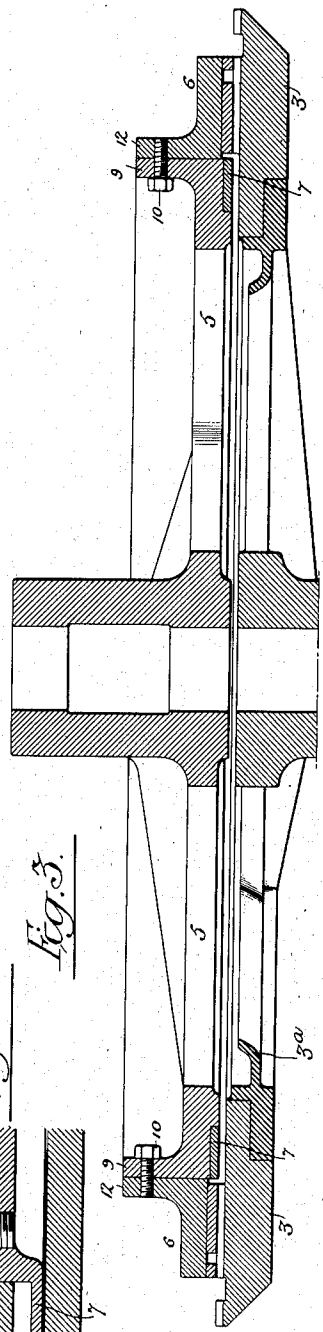


Fig. 3.

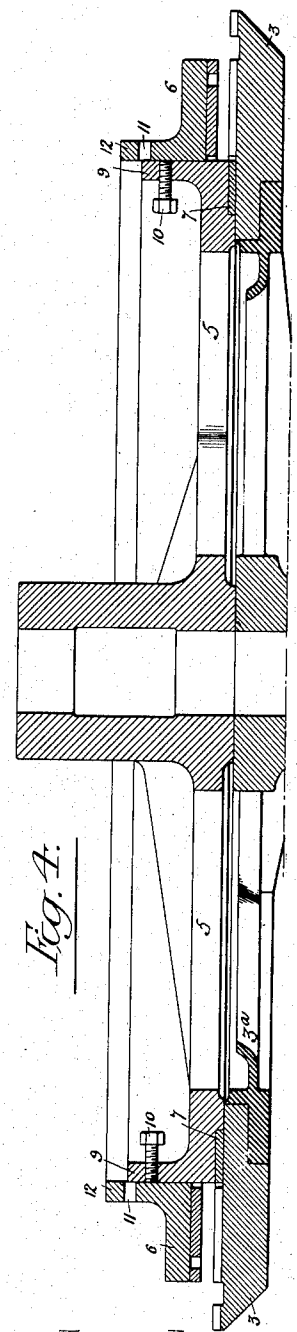


Fig. 4.

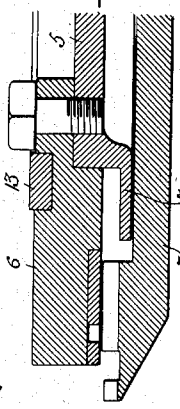


Fig. 4c.

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3 SHEETS—SHEET 3.

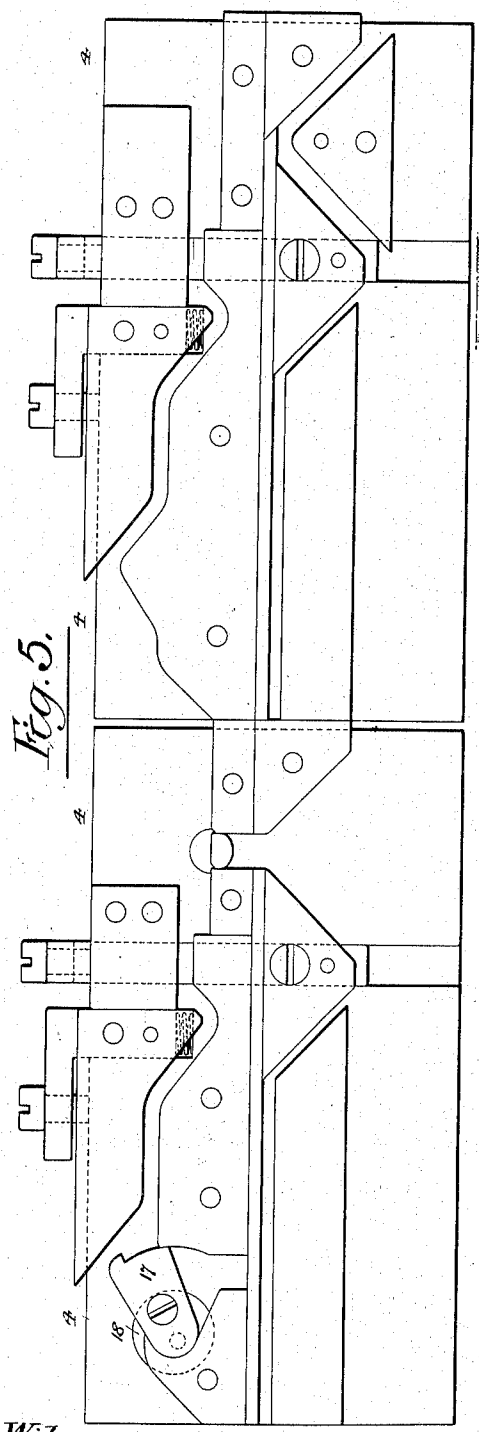


Fig. 5.

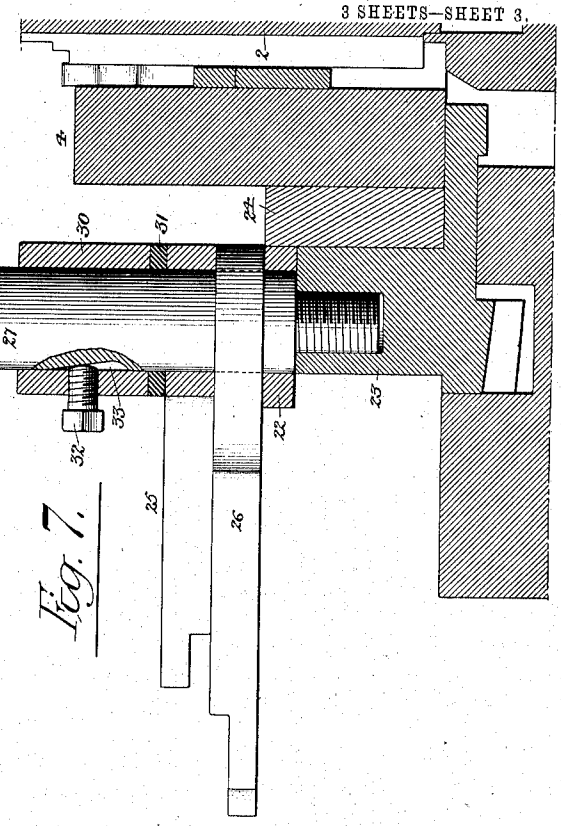


Fig. 7.

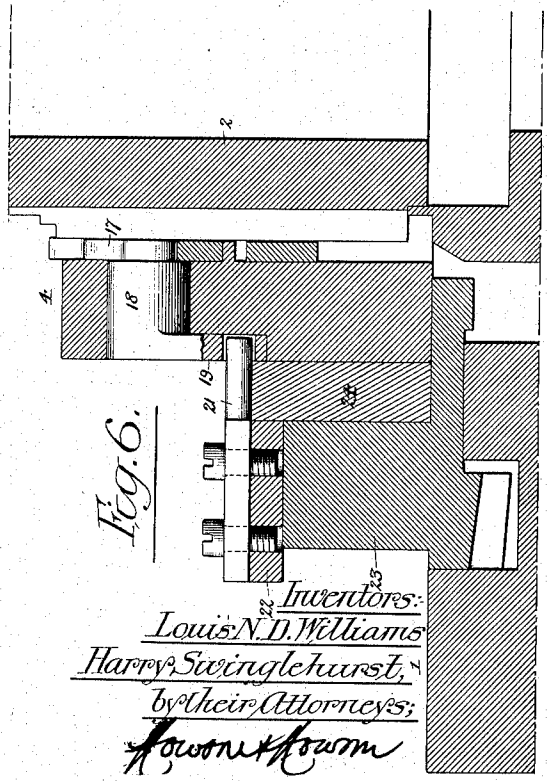


Fig. 6.

Witnesses:-

Hamilton D. Turner

Herman E. Mitchell

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UNITED STATES PATENT OFFICE.

LOUIS N. D. WILLIAMS, OF OGONTZ, AND HARRY SWINGLEHURST, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNORS TO ROBERT W. SCOTT, OF PHILADELPHIA, PENNSYLVANIA, AND SAID LOUIS N. D. WILLIAMS, OF OGONTZ, PENNSYLVANIA.

CIRCULAR-KNITTING MACHINE.

No. 864,496. Specification of Letters Patent. Patented Aug. 27, 1907

Application filed May 29, 1903. Serial No. 159,343.

To all whom it may concern:

Be it known that we, LOUIS N. D. WILLIAMS, of Ogontz, Montgomery county, Pennsylvania, and HARRY SWINGLEHURST, of Philadelphia, Pennsylvania, have invented certain Improvements in Circular-Knitting Machines, of which the following is a specification.

The objects of our invention are to facilitate access to the dial needles and dial plate cams of the machine, to permit inspection of the inner side of the tubular web which is being produced, to use, in a more effective manner than before, a templet such as set forth in Letters Patent No. 709,841 dated September 23rd 1902, and to provide efficient means for controlling the operation of certain of the cams of the needle cylinder so as to permit of change in the character of the stitch produced.

In the accompanying drawings:—Figure 1, is a sectional plan view of sufficient of a circular rib knitting machine to illustrate the application of our improvements thereto; Fig. 2, is a vertical section of the dial cam plate of the machine; Figs. 3 and 4, are similar views illustrating another embodiment of one feature of our invention; Fig. 4ª, is a vertical section of part of the dial cam plate, illustrating another modification of the same; Fig. 5, is a view, illustrating, in a flat plane, certain of the cams of the cylinder cam box; Figs. 6 to 9, inclusive, are views, on an enlarged scale, and illustrating the mechanism employed for effecting movement of certain of the adjustable cams of said cam box.

Referring in the first instance to Fig. 1, it will be noted that 1 represents the fixed table or bed of the machine, 2 the stationary needle cylinder, 3 the stationary needle dial, 4 the vertical cam cylinder, and 5 the dial cam plate.

Both the dial and dial cam plate are in the present instance, of open or skeleton construction, being, in fact, constructed like a wheel with hub, spokes and rim, so that through the openings thus provided, the attendant who is operating the machine can inspect the interior of the knitted tube which is being produced, and thus readily discover any defects in the knitting which would not be visible from the outside of the machine or discoverable by an inspection of the outer face of the knitted tube. The rim of the dial has around the inner edge an annular cup or groove 3ª in order to prevent dripping of oil onto the web below. (See Figs. 3 and 4.)

Mounted upon the rim of the dial cam plate is an outer detachable ring 6 and upon the underside of this ring are mounted the cams for operating the dial needles, hence, whenever it is desired to gain access to said dial needles or to the cams for operating the same, this object can be effected by simply raising the ring 6 without disturbing the dial cam plate or its connection with the depending stem which carries the same.

In connection with the dial cam plate we employ a templet 7 of a character similar to that set forth in Letters Patent No. 709,841 before referred to, the purpose of this templet being to so adjust all of the needles, after the cam-carrying ring has been removed, that, when said cam-carrying ring is restored to position, the butts of the needles will be so disposed as to enter the cam grooves. The presence of this templet during the operation of the machine is, however, objectionable and for this reason we make the templet adjustable vertically in respect to the cam plate so that it can be depressed to operative position below the cams, as shown at the left hand side of Fig. 2, when the ring 6 is raised, or can be raised to inoperative position behind said cams, as shown at the right hand side of Fig. 2, when it is desired to lower the ring 6. If the templet is in sections this movement of the same in respect to the ring 6 can be readily effected by providing each section of the templet with one or more screws 8 each passing through openings in the dial cam plate and cam carrying ring 6, and each provided on the back of said ring 6 with a thumb nut 8ª as shown in Fig. 2, but when the templet is in one piece the construction shown in Figs. 3 and 4 may be adopted. In this case the templet is secured to the dial cam plate 5 and the latter is provided with an upwardly projecting flange or rim 9 provided with screws 10 for engaging openings 11 in a similar upwardly projecting flange 12 on the cam ring 6. When the cam ring 6 is lowered so as to bring its cams into position to operate upon the butts of the dial needles as shown in Fig. 3 the dial cam plate 5 is slightly elevated on its central stem or post as shown in said figure so that the templet 7 occupies a position behind the dial cams and out of the way of the stems of the dial needles. When it is desired to raise the cam ring 6, however, the screws 10 are withdrawn from the openings 11 in the flange of the cam ring and the dial cam plate 5 can then be permitted to descend until it rests upon the top of the dial the templet 7 being then in position to strike the ends of the dial needle stems in adjusting the latter.

The construction shown in Fig. 4ª is substantially the reverse of that shown in Fig. 4, the templet 7 in this case being normally in a plane below that of the needles, and being lifted with the dial cam plate in order to engage the ends of said needles.

When certain of the cams on the cam ring 6 are adjustable for the purpose of varying the character of

the stitch produced by the dial needles the simultaneous adjustment of these cams can be effected by mounting upon said ring 6 an annular plate 13 having an upwardly projecting pin 14 which is engaged by the two pivoted levers 15 and 16 as shown in Fig. 2, each of these levers being pivoted to the ring 6 and the levers being operated alternately by means of a disk or other device projected into the path of travel of the same in the ordinary manner, the striking of one lever serving to move the annular plate 13 in one direction and the striking of the other lever causing it to move in the other direction.

We have not shown the cams of the dial cam plate or their connection with the annular plate 13, as these may be varied in many ways, and form no special feature of our invention, and their illustration would only serve to confuse the drawing. As an instance, however, I may refer to the pivoted dial cams shown in L. N. D. Williams's Patent No. 491,911, February 14, 1893, it being evident that arms on the pivot pins of such cams can be readily engaged by the plate 13, so as to move the cams in either direction.

The adjustable cam 17 of the vertical cam cylinder 4 is carried by a hub 18 which is free to turn in a bearing in said cam cylinder and has, at its outer end, a depending arm 19 contained within a segmental recess 20 in the face of the cylinder, as shown in Fig. 9. Each arm 19 engages with an inwardly projecting pin 21 upon a ring 22, which is mounted upon the top of the rotating gear wheel 23 to which the cam cylinder 4 is secured and by which said cylinder is rotated, said ring 22 being properly centered by engagement with the filling block 24 which is interposed between each cam cylinder section 4 and the gear wheel 23, so as, by its removal, to permit retraction of each cam cylinder section 4 when it is desired to free the cylinder needles from the control of the cams.

In order to serve as a centering device for the ring 22 the filler block 24 extends above the level of the gear wheel 23, as shown in Figs. 6 and 7. Movements of partial rotation in one direction or the other are imparted to the ring 22 by means of levers 25 and 26 hung to one of the upwardly projecting posts 27 of the machine, these posts passing through segmental slots 28 in the ring 22 so as not to interfere with such movement. Each of the levers 25 and 26 is connected to the ring 22 by means of a link 29, one of these links being connected to the lever 25 on one side of the fulcrum of the same and the other being connected to the lever 26 on the opposite side of said fulcrum, as shown in Fig. 1, so that, when the lever 25 is struck by the disk or other operating device, which moves the same, the ring 22 will be moved in one direction, and, when the lever 26 is struck by said device, the ring 22 will be moved in the opposite direction.

Instead of mounting both of the levers 25 and 26 on one of the posts 27 each lever may be mounted upon a separate post if desired.

In order to impart such degree of friction to the levers 25 and 26 as will prevent them from being accidentally moved out of position, we mount upon the post 27, above the uppermost lever 25, a collar 30, and interpose, between this collar and the hub of said lever 25, a ring or washer 31, of leather or like material, which exercises a braking or retarding effect upon the movement of the levers in proportion to the pressure of the collar 30 thereon, and this pressure can be regulated by means of an adjusting screw 32 which is adapted to a threaded opening in the collar and engages a beveled slot 33 formed in the side of the post 27, as shown in Fig. 7.

Having thus described our invention, we claim and desire to secure by Letters Patent.

1. The combination in a circular knitting machine, of a dial cam plate with a surrounding ring vertically detachable from said dial cam plate and carrying the cams for operating the dial needles, substantially as specified.

2. The combination of a dial and its needles, a cam plate and its cams, with a templet for the adjustment of the needles, said templet being movable out of range of the needles when the cam plate is in position to actuate the same, substantially as specified.

3. The combination of a dial and its needles, a templet for the adjustment of said needles, and a dial cam plate recessed, so that the templet can be moved out of range of the needles and behind the cams, substantially as specified.

4. The combination of the dial cam plate and a ring surrounding the same, and carrying the cams for operating the dial needles, said dial cam plate and cam ring being each vertically movable in respect to the other, substantially as specified.

5. The combination of the dial cam plate and a ring surrounding the same, and carrying the cams for operating the dial needles, said dial cam plate and cam ring being each vertically movable in respect to the other, and said dial cam plate carrying a templet for the dial needles, substantially as specified.

6. The combination of a cam plate movable from and toward the needles, with a templet normally out of engagement with the needles but movable into engagement therewith, substantially as specified.

7. The combination of the dial cam plate having a templet for the dial needles, and an upwardly projecting flange or rim with retaining screws threaded therein, and a ring surrounding said dial cam plate and carrying the cams for operating the dial needles, said ring also having an upwardly projecting flange with openings for the reception of the retaining screws, substantially as specified.

8. A circular knitting machine having a dial and dial cam plate of open or skeleton form, and an oil retaining cup or groove on said dial, substantially as specified.

9. The combination in a knitting machine, of a pair of cam changing levers pivotally mounted upon a post or stud, a frictional retaining device for said levers, and means for varying the pressure of said frictional retaining device, substantially as specified.

10. The combination in a knitting machine, of a pair of cam changing levers pivoted to a stud or post, and a frictional retarding device for said levers having as an element a collar mounted upon said stud so as to be movable thereon parallel with the axis of the same, said collar having an adjusting screw which engages with a beveled recess in the stud, substantially as specified.

In testimony whereof, we have signed our names to this specification, in the presence of two subscribing witnesses.

LOUIS N. D. WILLIAMS.
HARRY SWINGLEHURST.

Witnesses:
F. E. BECHTOLD,
JOS. H. KLEIN.