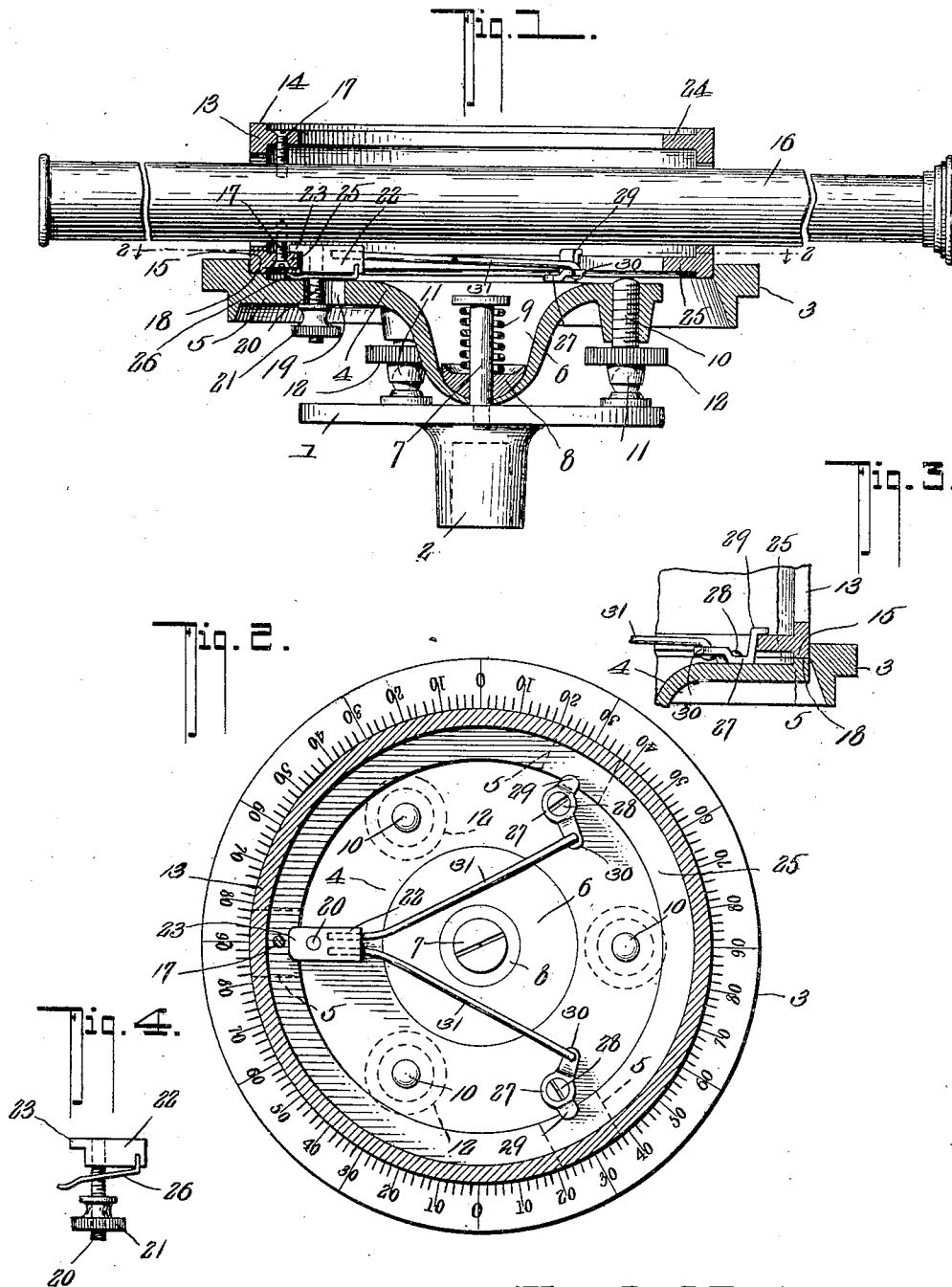


No. 814,111.

PATENTED MAR. 6, 1906.

E. A. BOSTROM.
LEVELING INSTRUMENT.
APPLICATION FILED JULY 13, 1905.



Witnesses

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LEVELING INSTRUMENT.

No. 814,111.

Specification of Letters Patent.

Patented March 6, 1906.

Application filed July 13, 1905. Serial No. 269,526.

To all whom it may concern:

Be it known that I, ERNST A. BOSTROM, a citizen of the United States, residing at Atlanta, in the county of Fulton and State of Georgia, have invented a new and useful Leveling Instrument, of which the following is a specification.

This invention relates to leveling instruments of the type disclosed in my prior patent, No. 786,093, granted March 28, 1905, and has for its object to improve the means for adjustably clamping the rotatable turret upon the stationary platen. In my prior device it is necessary to individually manipulate the several clamping devices for fixing the turret upon the platen, which of course involves a complicated adjusting operation, in view of which I propose in the present invention to enable the simultaneous adjustment of all of the clamping devices in a simple and efficient manner, thereby to secure an accurate adjustment of the turret as well as a quick clamping of the latter upon the platen.

The invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a vertical sectional view of a leveling instrument embodying the features of the present invention. Fig. 2 is a plan section on the line 2 2 of Fig. 1. Fig. 3 is a detail sectional view on the line 3 3 of Fig. 2. Fig. 4 is a detail view of one of the clamping members.

Like characters of reference designate corresponding parts in each and every figure of the drawings.

For the support of the several parts of the present instrument there is a flat head 1, designed to be mounted upon the top of a tripod or other character of supporting-stand, and for this purpose the head is provided with a central depending socket 2, which may be internally threaded or smooth, according to the character of the supporting-stand. Above this head is a platen made up of an external flat ring 3 and an internal spider 4,

which is disposed below the upper surface of the ring 3 and is connected thereto by a series of radial arms or webs, (designated 5,) one of which is shown in full lines at the left of Fig. 1 and all of them being shown in dotted lines in Fig. 2. The central portion of the spider 4 is provided with a depressed seat 6, the bottom of which is loosely pierced by an upstanding headed pin 7, which has its lower end threaded or otherwise rigidly and detachably secured to the center of the head 1. Within the seat 6 is a segmental or substantially semispherical member 8, which is also pierced by the pin 7, there being a helical spring 9 embracing the pin and bearing against the under side of the head thereof and the top of the member 8, whereby the platen is capable of being rotated around the pin 7 as a center and also capable of being slightly tilted in a vertical direction to enable leveling thereof. A series of leveling-screws 10 depend from the spider, to which they are threaded, and have their lower ends provided with seats or sockets loosely engaging the segmental or cylindrical tops of posts 11, rising from the head 1, so that by turning the leveling-screws 10 by means of the annular finger-pieces 12 thereof the top of the platen may be conveniently leveled.

The turret member 13, which is in the nature of a cylinder having similar top and bottom flanges 14 and 15, is mounted for rotatable adjustment upon the platen around the pin 7 as an axis, and this turret carries any common or preferred form of sight-tube 16 which is capable of vertical adjustment by means of the set-screws 17 piercing the top and bottom of the turret and engaging the sight-tube. As best indicated in Fig. 1 of the drawings, it will be understood that each of the radial arms or webs 5 of the spider 4 is provided at its outer end with an upstanding shoulder 18, the top of which is below the upper face of the platen, and constitutes a seat upon which one or the other of the flanges 14 and 15 of the turret is adapted to rotatably rest, thereby to space the bottom of the turret above the spider 4 and at the same time to have the flange of the turret seated below the upper face of the platen, so as to prevent edgewise displacement of the turret.

The upper face of the platen 3 is of course provided with a vernier-scale, as shown in

Fig. 2, the exterior of the turret being provided with a pointer or vernier cooperating with the scale to indicate the angular adjustment of the sight-tube.

5 As thus far described the present device is precisely the same as that disclosed in my prior patent, the features of the present invention being disclosed in the following description.

10 One of the radial arms or webs 5 of the platen is provided with a longitudinal slot 19 for the reception of a threaded pin 20, having a clamping-nut 21 upon its lower end for engagement with the under side of the arm.
 15 Upon the top of this pin is a clamping-block 22, provided at its outer end with a flange or lip 23, designed to overlap one or the other of the internal annular flanges 24 and 25, provided at the top and bottom ends of the turret. A leaf-spring 26 has one end secured
 20 to the under side of the block 22, with its free end extending toward the outer end of the block and bearing against the arm 5, so as to automatically elevate the clamping-block
 25 when the nut 21 is loosened, and thereby permit rotation of the turret upon the platen.

In addition to the clamping device just described there are two other duplicate clamps spaced at equal distances from the clamp 22
 30 and from one another, as clearly shown in Fig. 2. Each of these clamps consists of a turn-button 27, pivoted upon the spider 4 by means of a pivot-pin 28, centrally piercing the button and threaded into the spider. One
 35 end of the button is provided with an upstanding hook or overhanging lip 29 to engage the upper face of the adjacent internal flange of the turret. There is also a crank-arm 30 upon the button, with which is engaged the outer free end of a spring-rod 31,
 40 the other end of which is connected to clamping-block 22 in any suitable manner—as, for instance, by being set into a socket in the inner end of the block.

45 When the pin 20 is at the outer end of the slot 19, the lip 23 of the clamping-block 22 will overlap the flange 25 of the turret, and this is also true of the lips 29 of the turn-buttons or pivotal clamp members 27, whereby
 50 the turret will be held upon the platen in a very simple and efficient manner. To release the turret, the nut 21 is loosened and the pin 20 pushed into the inner end of the slot 19, so as to remove the lip 23 from the lower
 55 internal flange of the turret, the clamping members 27 being simultaneously turned out of engagement with the lower internal flange of the turret through the medium of the connecting-rods 31. After all of the clamping
 60 devices have been released from the turret the nut 21 is tightened so as to hold the clamping members in their released positions, whereby the turret may be lifted from the platen, inverted, and returned to the platen,
 65 whereupon the nut 21 is loosened and the

tension of the spring-rods 31 will automatically return the three clamping members to their normal positions in engagement with the lower internal flange of the turret, the
 70 nut 21 of course being afterward tightened so as to maintain all of the clamping devices in positive engagement with the turret.

Having fully described the invention, what is claimed is—

1. In a device of the class described, a 75 platen, a rotatable turret removably supported thereon, a plurality of turret-engaging clamps carried by the platen, and means for simultaneously actuating all of the clamps by manipulation of one of said clamps. 80

2. In a device of the class described, a platen, a rotatable turret seated upon the platen, a plurality of turret-engaging clamps carried by the platen, and means connecting one of the clamps with the other clamps for 85 simultaneously actuating said other clamps by the actuation of the first-mentioned clamp.

3. In a device of the class described, a platen, a turret rotatably supported upon the 90 platen and provided with an annular ring, a plurality of turret-engaging clamps carried by the platen and having frictional engagements with the ring of the turret, and means for simultaneously manipulating the clamps. 95

4. In a device of the class described, a platen, a turret seated thereon, a slidable turret-engaging clamp carried by the platen, pivotal turret-engaging clamps carried by the platen, and means connecting the slidable 100 clamp with the pivotal clamps for simultaneously actuating the pivotal clamps by actuation of the slidable clamp.

5. In a device of the class described, a platen, a turret seated thereon, a plurality of 105 turret-engaging clamps carried by the platen, one of the clamps being slidable upon the platen, means to fix the slidable clamp at opposite limits of its slidable movement, and means connecting the slidable clamp with 110 the other clamps for simultaneously actuating said clamps by the actuation of the slidable clamp.

6. In a device of the class described, a platen, a turret seated thereon, a plurality of 115 turret-engaging clamps carried by the platen, one of the clamps being slidable, means to fix the slidable clamp at opposite limits of its movement, and spring-rods connecting the slidable clamp with the other clamps for releasing said other clamps by the releasing of 120 the slidable clamp, said spring-rods constituting means to automatically return all of the clamps into engagement with the turret when the slidable clamp is released at its inner limit. 125

7. In a device of the class described, a platen, a turret seated thereon, turret-engaging clamps carried by the platen and movable into and out of engagement with respect 130

to the platen, means for fixing one of the clamps in its engaged and disengaged positions, and tensioned devices connecting said clamp with the other clamps to release said other clamps by the releasing of the first-mentioned clamp, said tensioned devices constituting means for automatically returning all the clamps into engagement with the turret when the first-mentioned clamp is released from its disengaged position.

8. In a device of the class described, a turret seated thereon, turret-engaging clamps carried by the platen, certain of the clamps being pivoted intermediate of their ends upon the platen and having lips to overhang a portion of the turret, and means connecting said pivotal clamps with another clamp for controlling the pivotal clamps by actuation of said other clamp.

9. In a device of the class described, a platen, a turret seated thereon, a pair of intermediately-pivoted clamps mounted upon the platen and provided with lips to overhang a portion of the turret, a slidable clamp carried by the platen and provided with a lip to overhang a portion of the turret, and spring-rods connecting the slidable clamp with the pivotal clamps to control the latter by the actuation of the slidable clamp.

10. In a device of the class described, a platen, a turret seated thereon, a pair of pivotal clamps carried by the platen and having lips to overhang a portion of the turret, a slidable clamp carried by the platen and having a lip to overhang a portion of the turret, means to fix the slidable clamp at the opposite limits of its movement, and spring-rods

connecting the slidable clamp and the pivotal clamps for controlling the latter by the movements of the slidable clamp, said spring-rods constituting means to automatically return all of the clamps into engagement with the turret when the slidable clamp is released from its unclamped position.

11. In a device of the class described, a platen having a seat and a substantially radial slot, a turret fitted in the seat and provided with an internal annular flange, a pin projecting through the slot and movable longitudinally thereof, a clamp-block carried by the inner end of the pin and provided with a lip to overhang the internal flange of the turret, a clamping-nut carried by the outer end of the pin to detachably hold the latter at opposite ends of the slot, a pair of intermediately-pivoted clamps mounted upon the platen and provided with lips to overhang the internal flange of the turret, and spring-rods connecting the clamp-block with the pivotal clamps for controlling the latter by the slidable movements of the block, said spring-rods constituting means to automatically return all of the clamps into engagement with the flange of the turret when the clamping-screw is released at the inner limit of the clamping-block.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ERNST A. BOSTROM.

Witnesses:

I. A. BRADY,
J. L. MOORE.