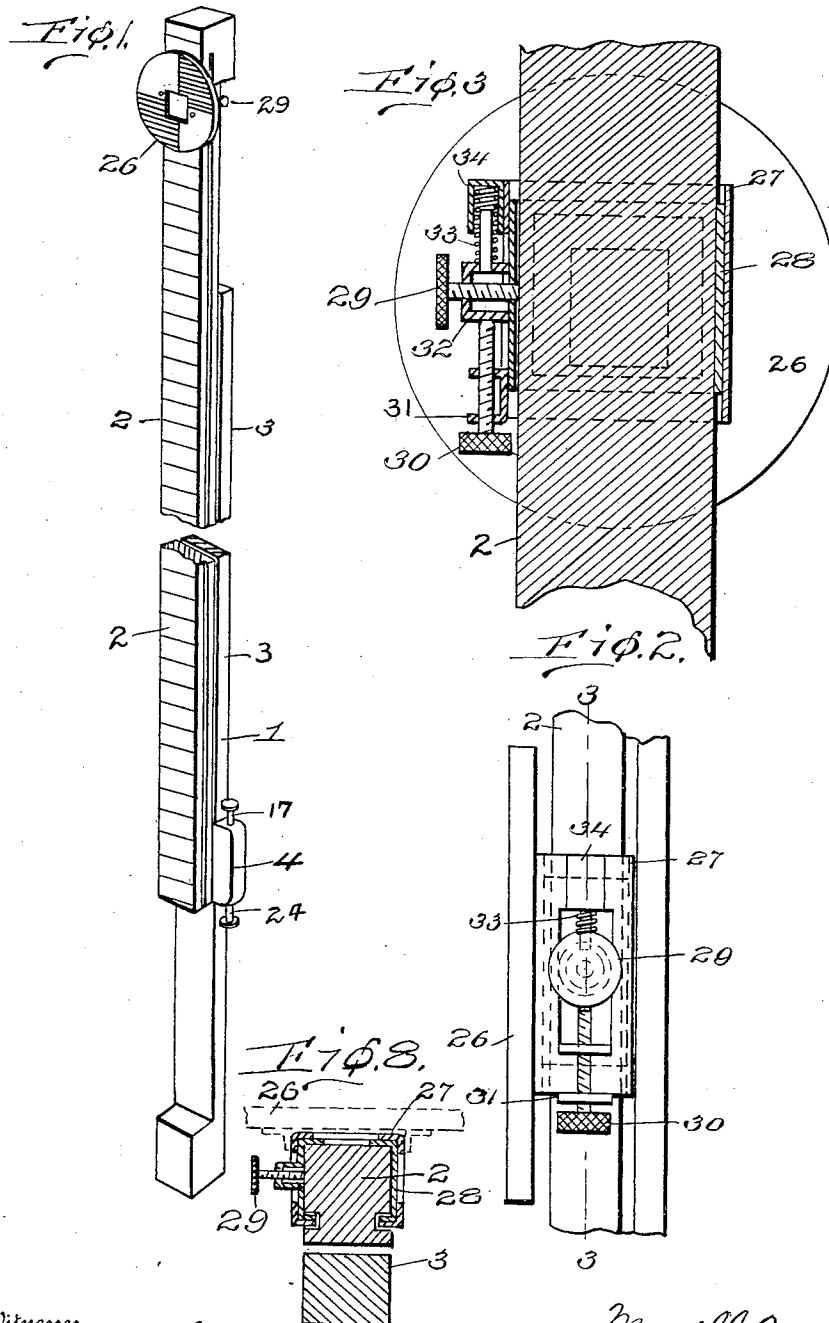


M. M. GOODNOW.
SURVEYOR'S ROD.
APPLICATION FILED DEC. 4, 1908.

1,064,470.

Patented June 10, 1913.

2 SHEETS—SHEET 1.



Witnesses
J. M. Fowler
A. L. Kitchen

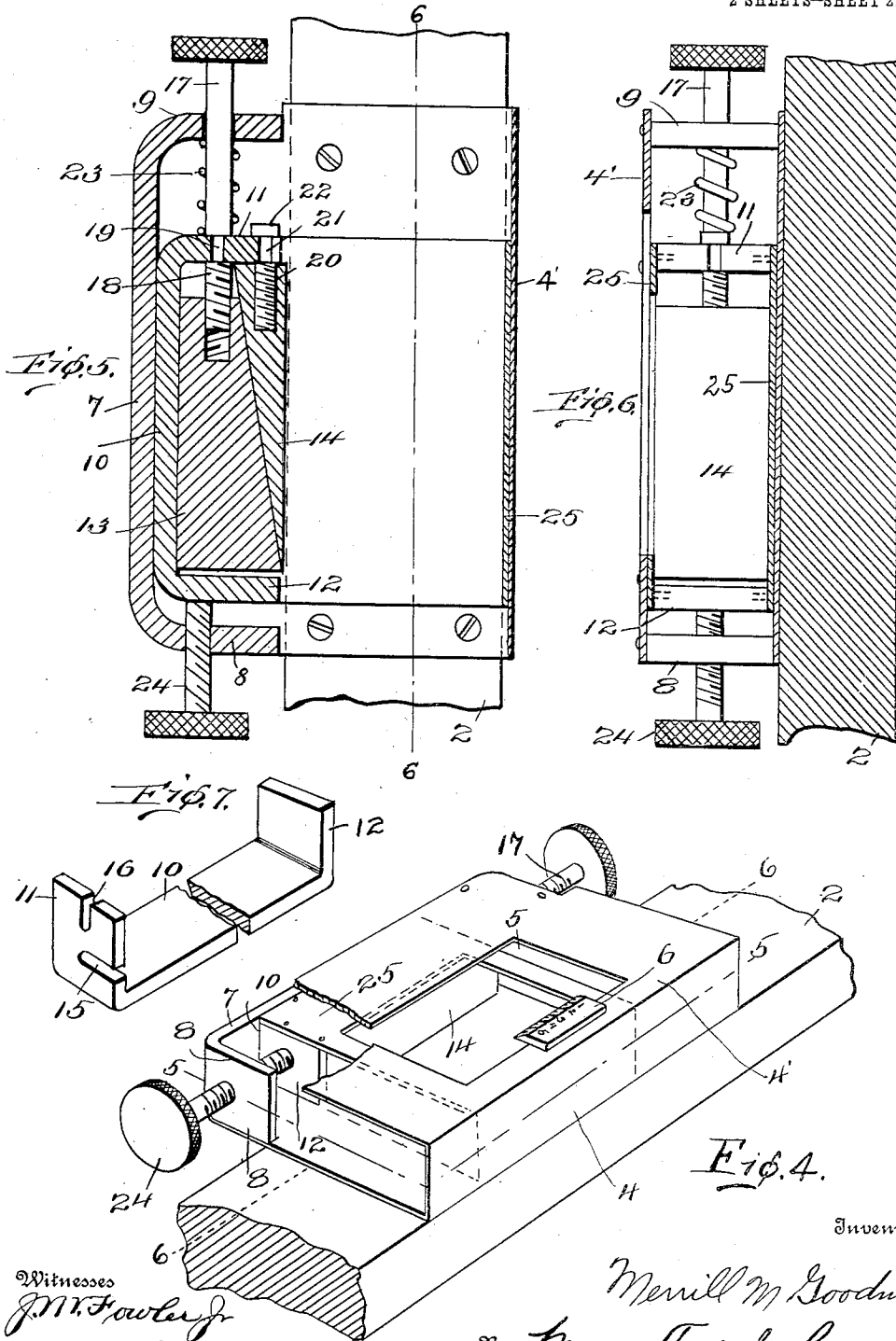
Inventor
Merrill M. Goodnow
By Mason F. Lawrence
his Attorneys

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UNITED STATES PATENT OFFICE.

MERRILL M. GOODNOW, OF SEATTLE, WASHINGTON.

SURVEYOR'S ROD.

1,064,470.

Specification of Letters Patent.

Patented June 10, 1913.

Application filed December 4, 1908. Serial No. 466,017.

To all whom it may concern:

Be it known that I, MERRILL M. GOODNOW, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Surveyors' Rods; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in surveyors' level rods, and particularly to adjusting means for varying the height of the same, and has for an object the arrangement of an adjusting means that may be quickly adjusted to an approximately correct position, and then be adjusted exactly to the desired position by an auxiliary adjusting means.

Another object of the invention is the provision of a surveyor's rod arranged in a plurality of parts and adapted to be clamped together by means that may be adjusted quickly to a substantially correct position and then to the exact position desired by the manipulation of a tension screw moving the clamping means and the part of the rod held by the clamping means.

A further object in view is the provision of a pair of clamps for a surveyor's rod, one of which is designed to provide a broad surface for clamping the parts of the rod together and afford means to finally adjust the position of the clamp, and the other clamping means being arranged to carry a target and to be quickly adjusted to approximately the desired position, and then by the manipulation of a clamping slide to exactly position the target at the desired point.

A still further object of the invention is the construction of a surveyor's rod arranged with means for adjusting the length of the parts thereof and for further adjusting the means thereon to any slight degree for affording exact work.

With these and other objects in view the invention comprises certain novel construction, combinations and arrangement of parts as will be hereinafter more fully described and claimed.

In the accompanying drawings: Figure 1 is a perspective view of a rod embodying the features of the invention. Fig. 2 is an enlarged detail fragmentary view of the rod showing an edge view of the target and

means for holding the same in position. Fig. 3 is a section through Fig. 2 approximately on line 3—3. Fig. 4 is an enlarged detail perspective view of a clamping member for clamping the respective parts of the rod together. Fig. 5 is a section through the structure shown in Fig. 4 approximately on line 5—5 thereof. Fig. 6 is a section through the structure shown in Figs. 4 and 5 approximately on line 6—6. Fig. 7 is a perspective view of a portion of a sliding bar shown in section in Fig. 5. Fig. 8 is a central horizontal section through the target clamp of Fig. 2, and showing both sections of the rod.

In the construction of surveyors' rods heretofore it has been customary simply to provide a rod in two or more parts and to provide bands or other means for holding the same together which will allow the rod to be moved to the desired position and then clamped. By this construction a comparatively long time is used in getting an exact adjustment of the two parts, or else the adjustment is not absolutely true, as extreme care must be taken to hold the parts of the rod in correct position while fastening the clamping means, or the same will become slightly displaced. The present invention is aimed to overcome the disadvantage of any slight displacements in clamping the parts of the rod together and in order to overcome this disadvantage a clamping means is provided and adjusting means also provided within the clamping means so that after the rods have been clamped together the adjusting means may be operated for adjusting the rod in either direction, until the lines are properly positioned to the exact place desired. In the present invention not only the clamping means for holding the rods together is provided with adjusting means for adjusting the position of the rod after the clamp has been secured, but adjusting means are provided for the clamp of the target for adjusting the same after the target has been clamped in position. These auxiliary adjustments in the respective clamps afford means that will permit an exact adjustment of not only the rod but the target so that exact measuring or surveying may be done. In order to more clearly disclose the invention an embodiment is shown of the present invention in which—

1 indicates the rod formed of parts 2 and

3 slidably secured together. A clamping member 4 is secured to part 2 by any desired means, and is arranged to encircle part 3, and by means arranged therein to clamp part 3 against movement relative to part 2. Above clamp 4, parts 2 and 3 may be held together by any suitable means. The clamping device 4 is formed of clamping members 13 and 14 and a housing 4' that has provided therein an opening 5 through which the indicating lines on part 3 may be seen, and adjusted to agree with the indicating lines on scale 6 mounted on housing 4'. The housing 4' extends entirely across part 2 and a short distance beyond the same, the part extending beyond part 2 having secured thereto a partially encircling bar 7 that is bent up at both ends as at 8 and 9. Mounted within the housing 4' and contacting with bar 7 is a second bar 10 that is preferably bent up at its ends 11 and 12 and incloses or substantially incloses a pair of clamping members 13 and 14. End 11 is provided with slots 15 and 16, slot 15 accommodating clamping screw 17 which is threaded at 18 into the clamping wedge 13. The clamping screw 17 has a reduced portion at 19 that is adapted to fit into slot 15 so that upon the rotation of screw 17 the same will not move longitudinally but will move wedge 13 longitudinally as clearly shown in Fig. 5. Upon the longitudinal movement of wedge 13 a lateral movement will be given wedge 14 which is held in place by a screw 20 that is formed with a reduced portion 21 for fitting into slot 16, and a head 22 which will not permit movement longitudinally of wedge 14. By the construction of slot 16 which extends in the line of lateral movement of wedge 14 the wedge may be moved freely in a lateral but not in a longitudinal direction, while the reverse is true of wedge 13 which may be moved in a longitudinal and not in a lateral direction upon the operation of clamping screw 17. In order to hold yieldingly bar 10 from end 9 of bar 7 a spring 23 which is comparatively strong is arranged to encircle part of screw 17 and presses against end 9 and end 11. As will be clearly seen from Fig. 5 upon the rotation of screw 17 spring 23 will not be affected in the least, but upon the rotation of adjusting screw 24 in one direction bar 10 will be moved toward end 9 against the action of spring 23, and upon a reverse movement of screw 24 spring 23 will force bar 10 toward end 8. Connected to bar 10 by any desired means, as for instance rivets or screws, is secured the encircling housing 25 that encircles part 3 of rod 1 so that when screw 17 is rotated and wedge 14 is forced outward laterally the same will engage and clamp part 3 against one side of the housing 25. By reason of the comparatively long surface of

wedge 14 a large clamping area is provided that will firmly clamp part 3 against movement but in clamping the same against movement only housing 25 is clamped to part 3, the clamping device 4 being rigidly secured to part 2 and the adjusting means connected therewith serving to clamp part 3 at any desired position.

When it is desired to adjust part 3 to any desired position screw 17 is operated until wedge 13 is moved for releasing wedge 14, and the part 3 is moved to the desired position or approximately the desired position, and screw 17 is operated for clamping part 3 against movement. In clamping part 3 against movement by screw 17 the part 3 will sometimes move slightly or be slightly out of the correct position desired after the clamping operation has been completed. In order to rectify this all that is necessary is to operate adjusting screw 24 in either direction according to the direction of movement that is desired. Upon the operation of adjusting screw 24 bar 10 with wedges 13 and 14 will be moved longitudinally, and as part 3 is clamped thereto the same will be moved longitudinally while housing 4' on part 2 will be stationary. By this construction and arrangement a quick adjustment of the parts of the rod may be had and then after the parts have been clamped together an accurate readjustment may be had for exactly positioning the parts, and by the special means provided very little time is occupied in adjusting the clamping member 4 in the first instance and then re-adjusting the same.

In addition to the clamping member 4 for clamping parts 2 and 3 together a clamping member is provided for target 26. Target 26 is secured to a housing 27 by any desired means. Housing 27 is provided with an inner housing 28 secured to part 2 of rod 1 by any desired means, as for instance clamping screw 29 passing through one side of the housing 28 and engaging part 3 so as to lock the same against movement when target 26 is set. In manipulating target 26 to the desired position set screw 29 is loosened and the housings 27 and 28 are slid or moved longitudinally along part 2 to the position desired or approximately the position desired, and then set screw 29 is operated for engaging part 3 on one side and for causing housing 28 to engage part 3 on the opposite side. This adjustment as is evident may be quickly performed, especially as it is only necessary to get approximately the correct position. After the approximate correct position has been secured adjusting screw 30, which is threaded through an extension 31 of housing 27 bears against an extension 32 of housing 28 for moving the housing 27. Upon the rotation of adjusting screw 30 housing 27 will be

moved longitudinally of part 2 over housing 28, and as target 26 is rigidly secured to housing 27 the target will be moved at the same time for more accurately adjusting the same. Screw 30 is adapted to move housing 27 in one direction, while a spring 33 of any desired strength is adapted to move housing 27 in the opposite direction when screw 30 is loosened. Spring 33 is mounted in the extension 34 of housing 27 and bears against extension 32 of housing 28 so as to be in a position to force the housing 27 in one direction while screw 30 is adapted to force housing 27 in the opposite direction. By this construction and arrangement a quick adjustment of target 26 may be had, and then a second adjustment used for accurately positioning the target. The second adjustment will obviate any accidental movement of the target when clamping the same in position upon the first adjustment.

What I claim is:

1. In a surveyor's rod, a rod proper, a target therefor, a housing secured to said target, a second housing positioned within said first mentioned housing, said second mentioned housing secured to said rod proper, means for clamping said second mentioned housing to said rod proper, and a tension screw for varying the position of said housings in relation to each other for adjusting the position of said target on said rod proper.

2. In a surveyor's rod, a rod proper, a target, a housing secured to said target, a second housing positioned within said first mentioned housing and secured to said rod proper, an adjusting screw for moving said first mentioned housing longitudinally in one direction of said rod proper after said second mentioned housing has been clamped to said rod proper, and a spring for moving said first mentioned housing in an opposite direction.

3. In a surveyor's rod, a rod proper formed of a plurality of parts, an adjustable target connected with one of said parts, a clamp secured to said part last mentioned for engaging the adjacent part, said clamp comprising a primary housing, an adjustable secondary housing positioned within the primary housing, an adjusting screw for moving said secondary housing in one direction, means for moving said housing in the opposite direction, a pair of clamping wedges mounted in the secondary housing and adapted to engage the adjacent part of the rod, and means for varying the position of said wedges for causing them to clamp the part last mentioned, of said rod.

In testimony whereof I affix my signature in presence of two witnesses.

MERRILL M. GOODNOW.

Witnesses:

G. WARD KEMP,
G. L. BROOKS.