V. J. ODHNER.

CARRIAGE FOR RANGE FINDERS.

APPLICATION FILED SEPT. 8, 1910.

1,068,159.

Patented July 22, 1913.

5 SHEETS—SHEET 1.

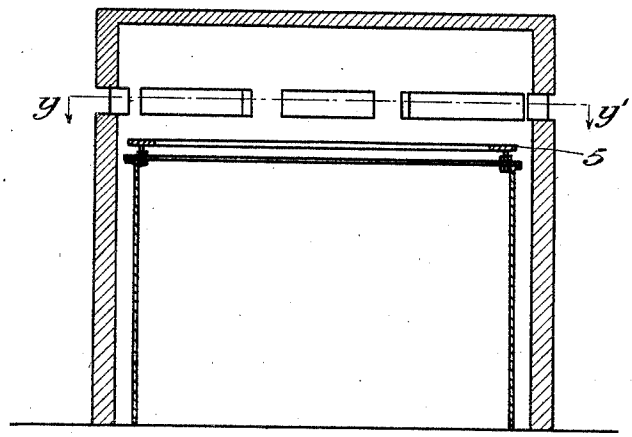


Fig. 1

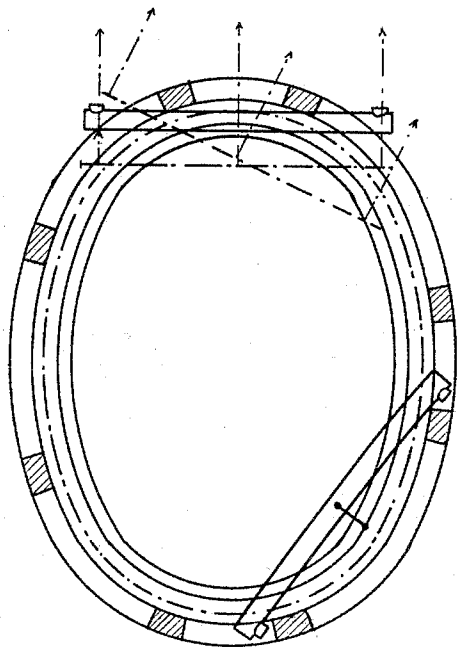


Fig. 1a

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5 SHEETS—SHEET 2.

Fig. 2

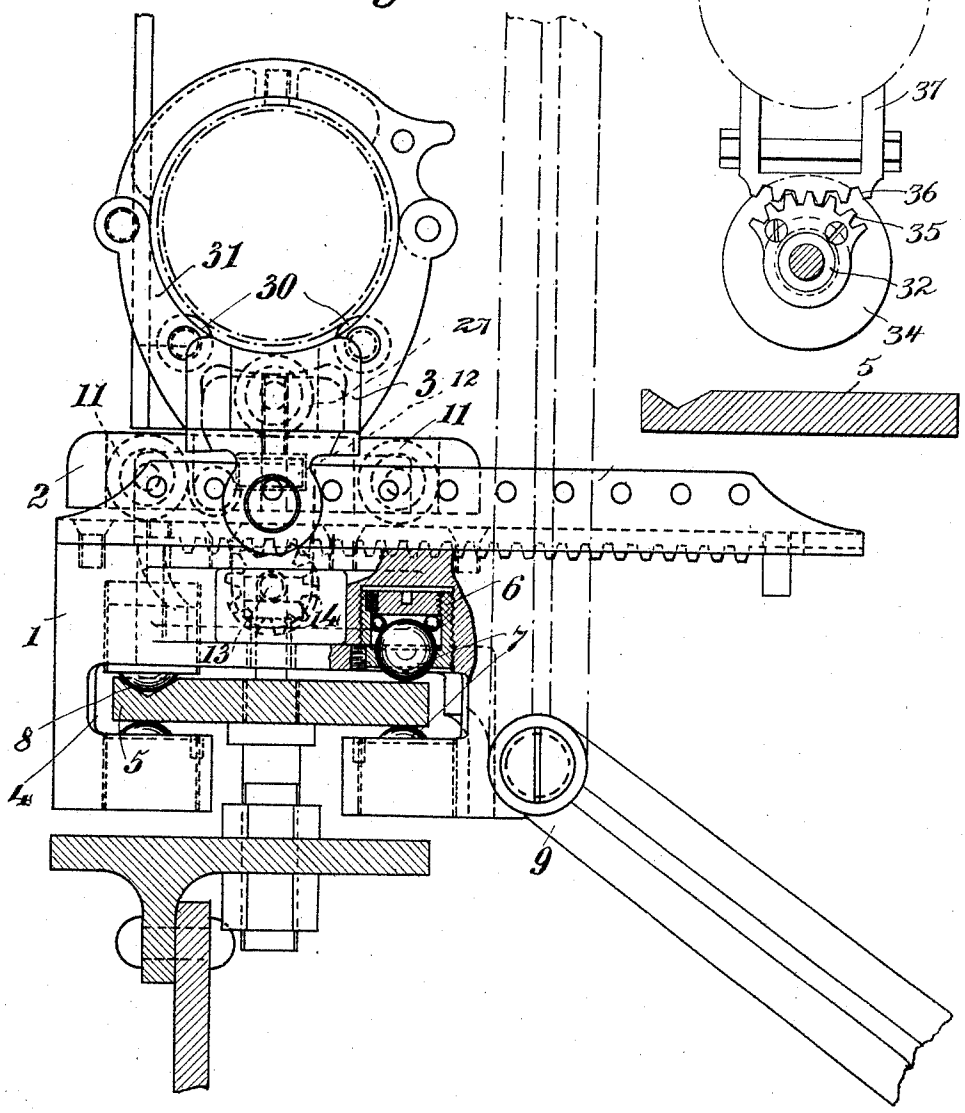


Fig. 5.

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5 SHEETS—SHEET 3.

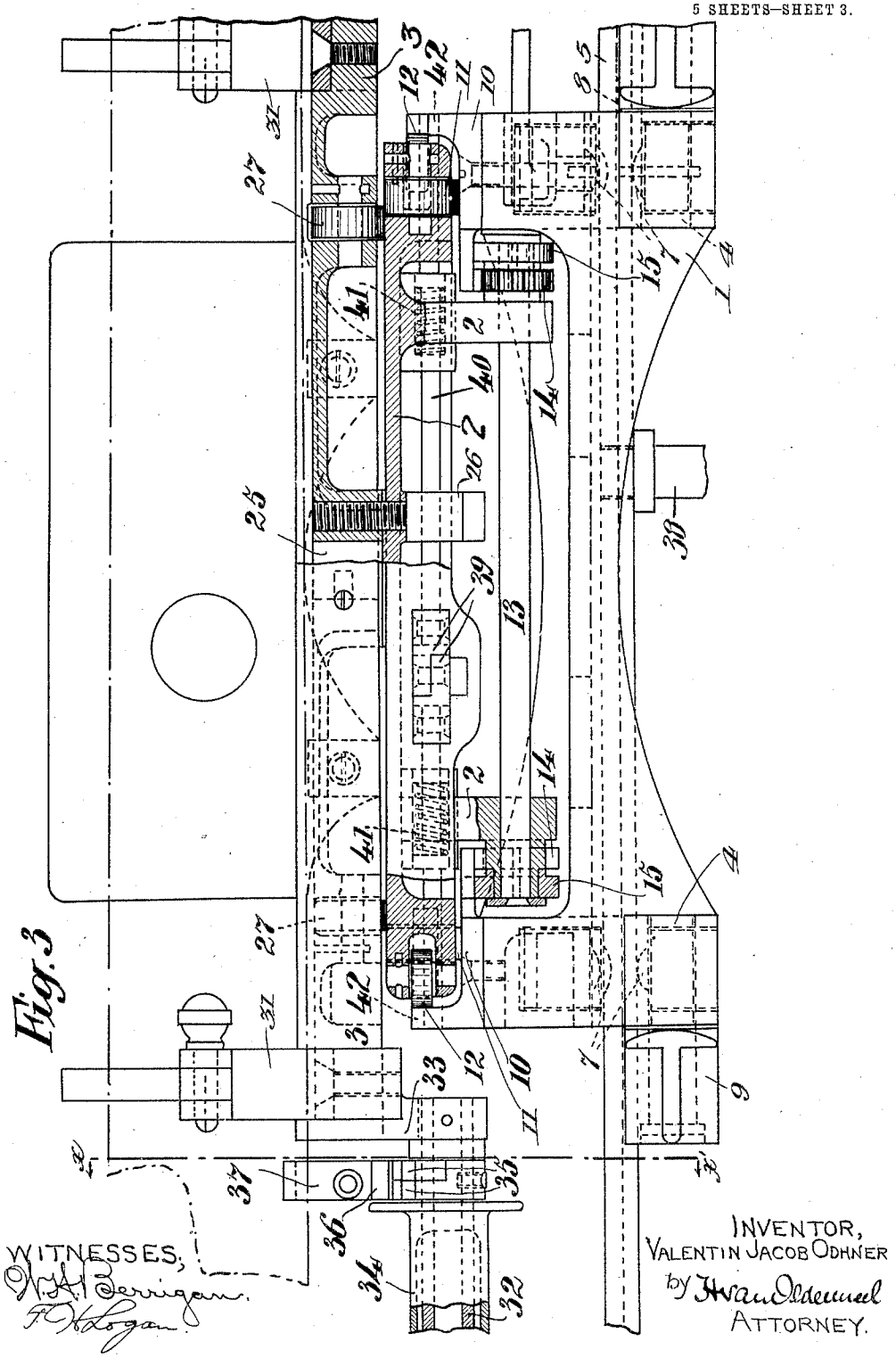


Fig. 3

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5 SHEETS—SHEET 4.

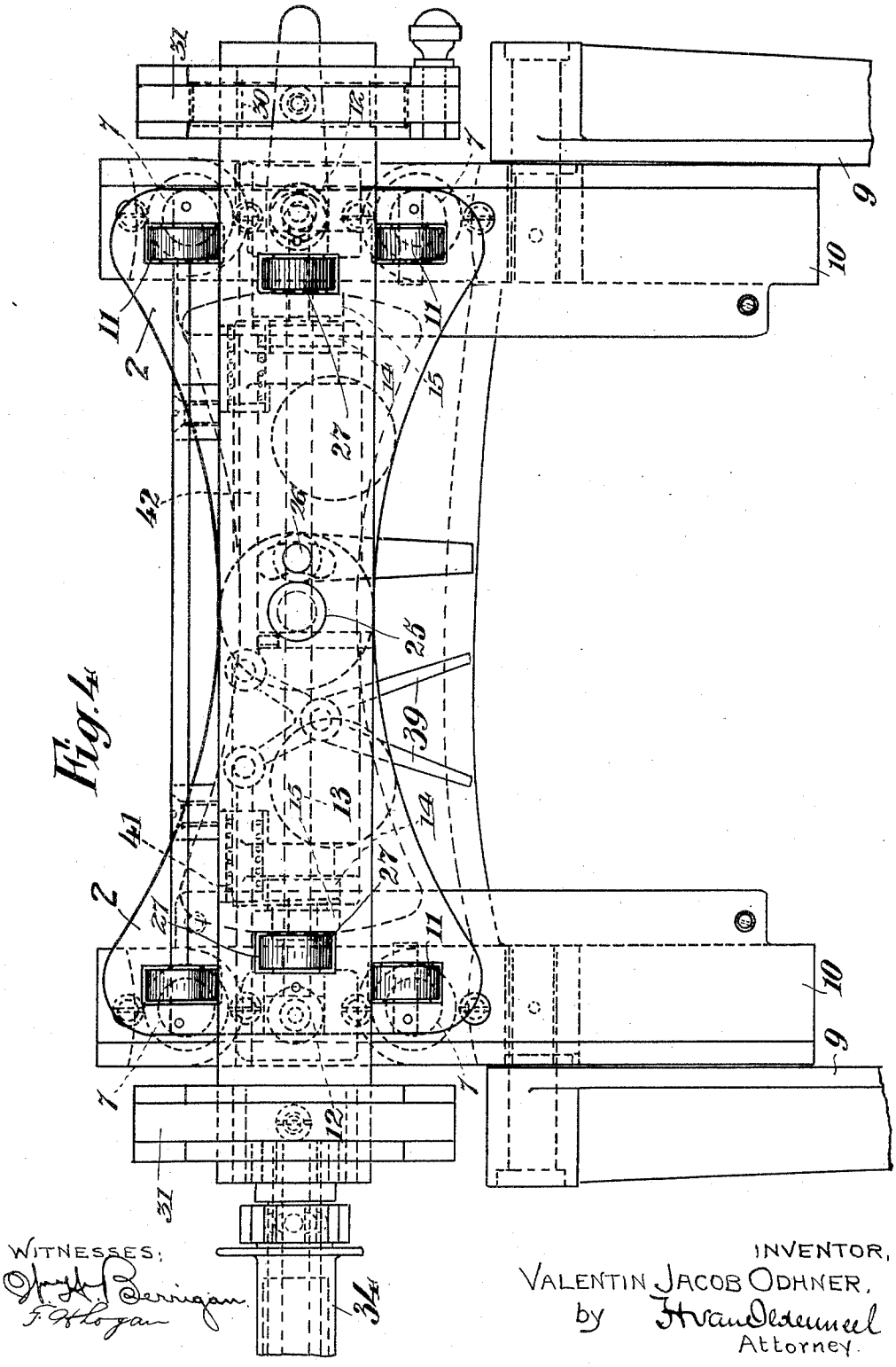


Fig. 4.

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CARRIAGE FOR RANGE FINDERS.

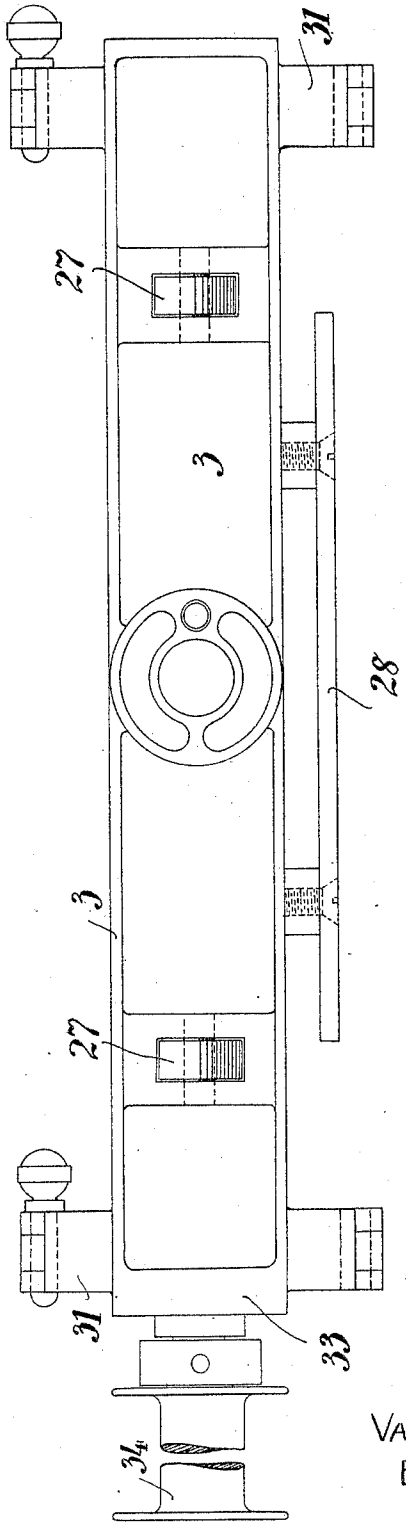
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5 SHEETS—SHEET 5.

Fig. 6.



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CARRIAGE FOR RANGE-FINDERS.

1,068,159. Specification of Letters Patent. Patented July 22, 1913.

Application filed September 8, 1910. Serial No. 580,954.

To all whom it may concern:

Be it known that I, VALENTIN JACOB ODHNER, a subject of the King of Sweden, and residing at St. Petersburg, Russia, have invented certain new and useful Improvements in Carriages for Range-Finders, of which the following is a specification.

This invention relates to a movable carriage for a range finder used in an inclosed space.

The carriage can be controlled by a single person, namely the party using the range finder, the various controlling operations being possible for him without changing the position of his body and arms. This condition is imperative since the observation of the range in a chamber or turret inclosed on all sides greatly restricts the observer in his movements.

The turret has a number of horizontal openings in its periphery into which the ends of the tube of the range finder project so as to increase considerably the field of view, as indicated diagrammatically in Figure 1. This arrangement, however, prevents a free movement in the interior of the turret owing to the walls between the openings, wherefore the carriage must be withdrawn from the wall, while in certain cases it must be pushed up to the wall. This latter movement is necessary in order to obtain a greater vertical amplitude when the ship rolls, assuming that the turret in question is on board ship. The withdrawal of the range finder from the wall is necessary when it is required to move the carriage about in the turret.

In setting the range finder on the target it is necessary that the range finder shall be turned in a horizontal plane and brought nearer to or removed from the wall of the turret; in many cases indeed it must at the same time be shifted about within the turret. For this purpose the present invention provides the carriage for the range finder, which carriage runs on rails in the known manner, with a part adjustable transversely to the rails and a part which rotates on the first-named part and carries the range finder.

The carriage hitherto used for the range finder cannot be used in gun turrets on account of the large space which it occupies.

In the accompanying drawings there is shown by way of example a construction of the carriage for the range finder.

Figs. 1 and 1ª show diagrammatically the arrangement of the range finder in the observation turret, Fig. 1ª being a section on the line $y\ y'$ of Fig. 1. Fig. 2 is a part cross section through the carriage for the range finder near one end thereof. Fig. 3 is a part central longitudinal vertical section thereof. Fig. 4 is a plan. Fig. 5 is a detail view, on the line $x—x'$ Fig. 3, and Fig. 6 is a bottom view of the rotatable part.

The essential parts of the carriage are the lower traveling part 1, the middle traveling part 2 and the upper rotatable part 3.

The lower part 1 consists of a long beam which is cut away at both ends, as at 4, so as to embrace a straight or curved (elliptical or circular) rail 5 which is mounted on a foundation or stand in the observation turret in an adjustable manner by means of a screw 38 and upon which the carriage rolls. For this purpose the beam 1 is provided at its ends with holes to receive ball bearing sockets 6 and balls 7. Two of these balls run on the upper face of the rail 5 in a V-shaped groove 8 so that movement of the carriage transversely on the rail shall be impossible. The other balls run on the parallel surfaces of the rail (Fig. 2). On one side of the beam are mounted two projecting levers 9 which embrace the observer using the range finder and have such a position that by pressing against them with the hips he can shift the carriage along the rail. Transversely to the beam 1 there is on each side a rail 10 formed also as a toothed rack.

The middle part 2 has a quadrangular form and in each of its angles is mounted a roller 11 which runs on the rails 10 whereby this part 2 can be adjusted transversely. Two lateral rollers 12 (Fig. 3) serve for guiding the part 2 laterally. On a shaft 13 journaled in the part 2 is mounted on each side a toothed wheel 14 which engages with the rack on the aforesaid rail 10 and prevents an angular displacement in the to and

fro movements. On the nave of each toothed wheel is freely mounted a roller 15 which bears against the lower smooth part of the rail and prevents part 2 from being lifted.

The upper part 3 which is adapted to turn in a horizontal plane about its axis is mounted on a pivot pin 25 screwed into the middle of part thereof and pivotally secured in a hole in the middle of the part 2. This upper part 3 is guided in its turning movements by two lateral vertical rollers 27 which are journaled in it and run on the middle part 2 whereby a sure horizontal position is attained and the whole apparatus is made very stable. At each end of the upper part 3 is a bearing ring 31 (Fig. 2) provided with rollers 30 and adapted to receive the tube of the range finder. The possible movements so far described are for the purpose of adjusting the carriage horizontally and moving it forward or backward, besides shifting it on the rail 5 within the turret.

A binding screw 26 (Figs. 3 and 4) screwed in the part 3 passes through a slit in the part 2 and serves as a stop in the horizontal rotation of the carriage and limits the deviation thereof.

In order that it may be possible to adjust the range finder itself also in the vertical direction a device is provided whereby the tube of the range finder can be rotated about its axis.

The levers 39 serve to withdraw the two locking bolts 40 mounted in the middle part 2. These are pressed by special springs 41 into cylindrical seats 42 in the lower part 1 and serve to lock the middle part 2 with the under part 1.

As shown in Figs. 3 and 5 a handle 34 is mounted to rotate on a rod 32 fixed to a downwardly projecting part 33 of the upper part 3, this handle serving to turn the upper part on its pivot. There are also provided two toothed sectors 35 one of which is rigid with the handle 34 while the other can be turned upon the handle in order to compensate the lost motion in a known manner; these sectors are in engagement with a toothed sector 36 which is mounted on a projection 37 of the range finder. When the observer turns the handle in one direction or the other through one-eighth of a revolution, he turns the range finder through an angle of 10°. The carriage constructed in this manner renders it possible for the observer simultaneously to turn the range finder about its axis, to rotate the upper part in a horizontal plane, to bring the middle part nearer to the wall of the turret or to remove it farther from the wall and to shift the whole carriage without having to shift his arms.

Obviously the known devices for turning the range finder may be retained with very slight alteration.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. In range-finding mechanism, a track surrounding an entirely open space, a carriage mounted on said track, a part mounted on the carriage and displaceable transversely to the carriage track, in combination with a part rotatably mounted on the first-named part and a range-finder adjustable on the rotatably mounted part.

2. In range-finding apparatus, an eccentrically movable carriage, a range-finder, a pivotally mounted support for the range-finder, the axis of the range-finder support being coincident with the central axis of the carriage.

3. In range-finding mechanism, an eccentrically movable carriage, an axially mounted range-finder, in combination with a support for the range-finder, the range-finder being adapted to rotate upon its axis and the support adapted to rotate about the central axis of the carriage.

4. In range-finding mechanism, an axially mounted range-finder, a rotatable support for the range-finder, a handle rotatable about its own axis and attached to the rotatable support, a toothed segment attached to the range-finder, in combination with a toothed segment attached to the handle and adapted to be engaged by the segment on the range-finder.

5. In range-finding mechanism, a track in combination with a carriage movable on said track, said carriage being composed of three vertically arranged portions, a lower resting directly on the track, a middle portion provided with rollers resting on the lower portion, and an upper portion, rotatably mounted on middle portion, its axis of rotation corresponding with the middle axis of the carriage.

6. In a range-finding mechanism, a track, and a carriage built up of three portions, a rotatable portion carrying the range-finder, a middle portion upon which the rotatable portion is carried, and a bottom portion supporting the middle portion and supported itself by the track, the middle portion and the bottom portion being provided with rack and gear engagements, adapted to prevent angular displacement of the parts relatively to each other.

7. In range-finding mechanism, a track, a carriage supported on balls on said track, the track being provided with a V-shaped groove in which the balls on one side of the carriage rest and means fastened to and projecting from the carriage and adapted

to engage the body of the operator to shift the carriage.

8. In range-finding mechanism, a track, a carriage movable on said track, levers fastened to and projecting from the carriage adapted to engage the body of the operator and shift the carriage on the track.

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

VALENTIN JACOB ODHNER.

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