

E. REICHENBACH.

DITCHING LEVEL.

No. 383,767.

Patented May 29, 1888.

Fig. 1.

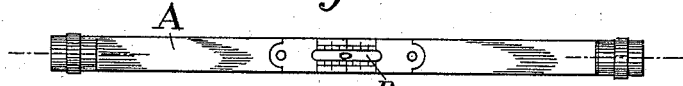


Fig. 2.

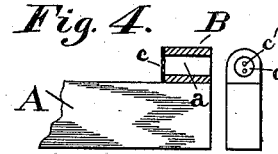
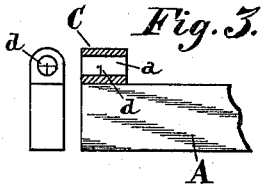
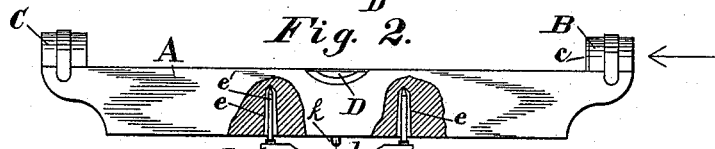


Fig. 5.

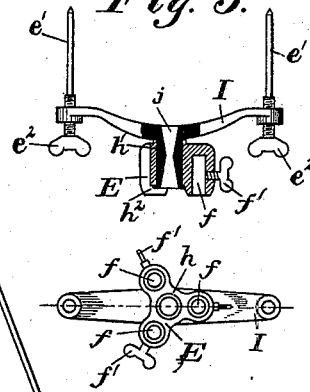
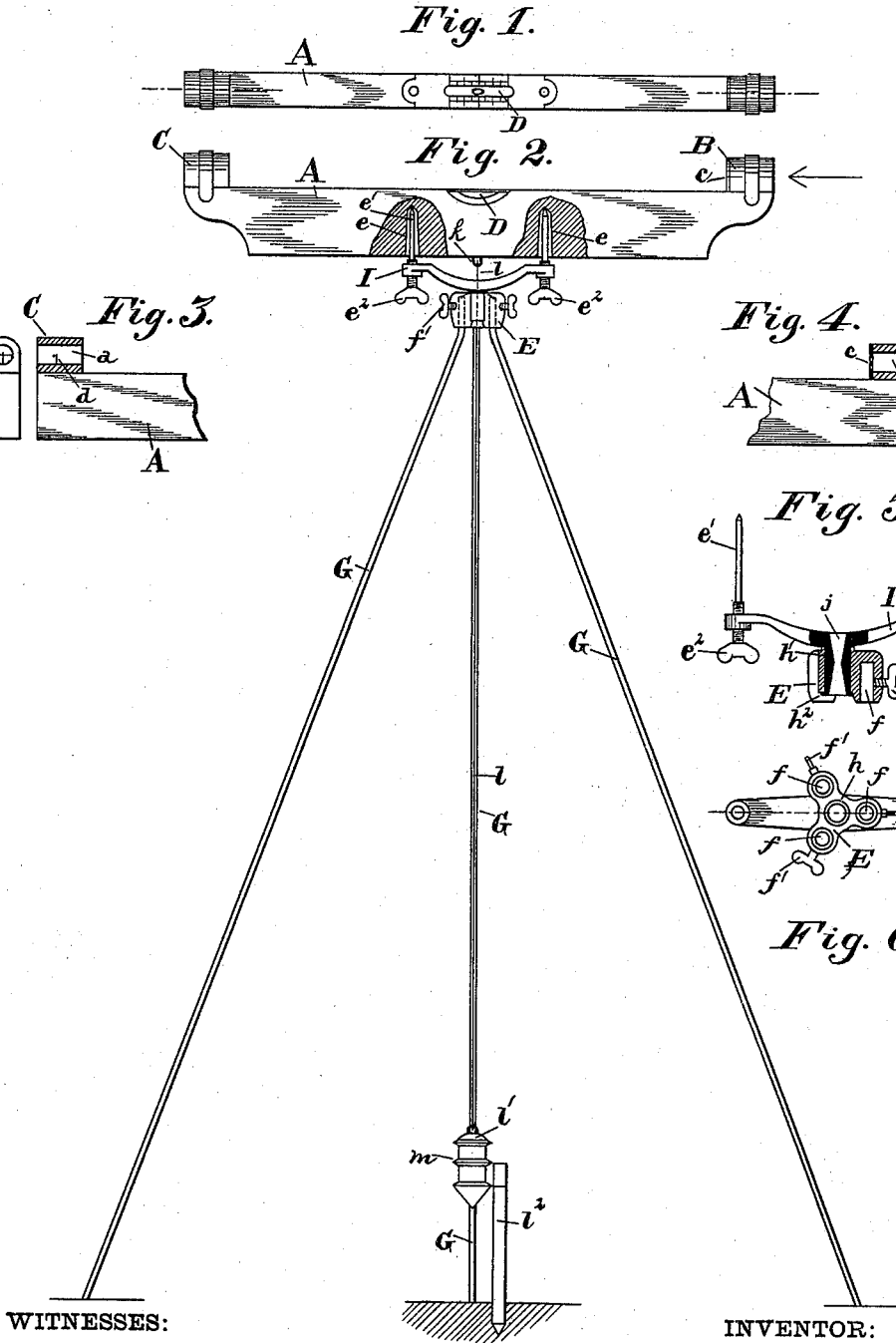


Fig. 6.



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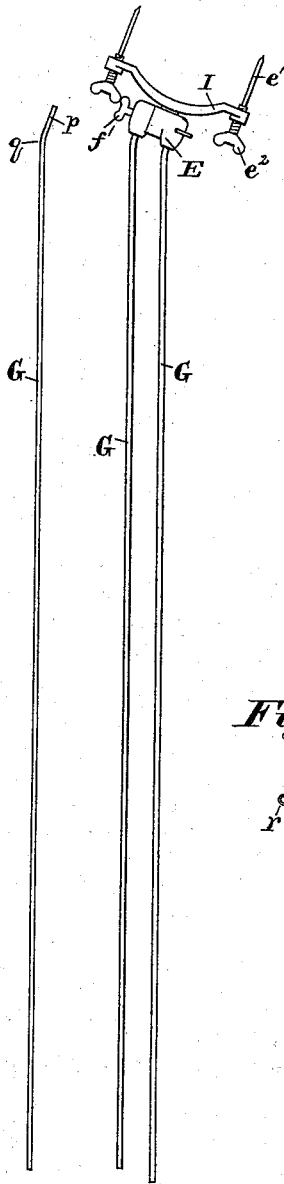


Fig. 7.

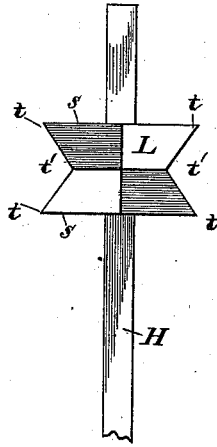


Fig. 8.

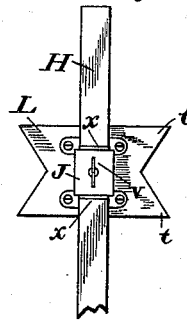


Fig. 9.

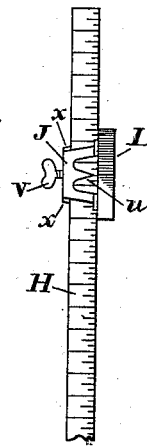


Fig. 10.

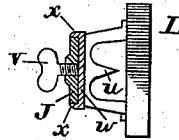


Fig. 11.

Fig. 12.



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UNITED STATES PATENT OFFICE.

EDWARD REICHENBACH, OF ORRVILLE, OHIO.

DITCHING-LEVEL.

SPECIFICATION forming part of Letters Patent No. 383,767, dated May 29, 1883.

Application filed February 4, 1883. Serial No. 262,903. (No model.)

To all whom it may concern:

Be it known that I, EDWARD REICHENBACH, a citizen of the United States, residing at Orrville, in the county of Wayne and State of Ohio, have invented certain new and useful Improvements in Ditching-Levels, of which the following is a specification.

My invention relates to a new and useful leveling-instrument for employment in making ditches for draining land and other similar purposes.

The accompanying drawings (two sheets) illustrate the invention.

Figure 1 is a top view of the body of the level. Fig. 2 is a side elevation of the level-instrument mounted on its legs. Fig. 3 shows two views of the "sight" at the target end of the level. Fig. 4 shows two views of the front sight or "eye-piece" end of the level. Fig. 5 is a sectional side view of the tripod-head. Fig. 6 is an inverted or bottom plan of the tripod-head. Fig. 7 shows one leg separate and the parallel position the three legs may take when it is desired to carry the instrument. Figs. 8, 9, and 10 show different side views of the target. Fig. 11 shows a vertical section of the target-block clamp. Fig. 12 is a cross-section of the target-rod.

The body A of the level has at each end a boss, B C, elevated above the top surface. Each boss has a sight-bore, *a*. The eye-piece boss B has at one end a plate, *c*, having holes *e'*, vertically one above the other. The other boss, C, has in its bore two wires, *d*, one crossing the other. On the top surface, midway between the two sight-bosses, is a glass spirit-level, D, extending lengthwise of the body. This body, as thus far described, is substantially the same as that shown, described, and claimed in Letters Patent of the United States No. 341,690, granted me May 11, 1886.

The body A has two vertical holes, *e*, entering at the lower side and extending upward toward the top surface. The upper end or crown of these two holes is contracted to the center, and from the said crown to the lower part or opening of the hole the said hole is enlarged or reamed out.

A tripod-head, E, has three sockets, *f*, each of which is provided with a set-screw, *f'*. These holes receive the ends of the legs G. Midway between the three sockets the tripod

has a vertical spindle-hole, *h*. A bar, I, has at its center a tubular spindle, *h'*, which fits in the spindle-hole *h* in the tripod-head. The tubular spindle is secured from coming out of the hole *h* by having its lower end, *h''*, flared outward slightly or spread "rivet" fashion. By this construction the bar I may be turned as a swivel. This bar has at each end a vertical screw-hole occupied by an upward-projecting pin, *e'*, which at its upper end is pointed and at its lower end has a thumb-screw, *e''*. The two upward-projecting pins *e'* occupy loosely the vertical holes *e* in the body A of the level, which latter is thereby supported. The level-body A is thus poised on the upper points of the pins *e'*, and is free to vibrate laterally and to assume a level position crosswise when the pins are not truly vertical. Either end of the level-body may be raised or lowered by the thumb-screw *e''*, and thus by the aid of the spirit-level D the body may be made perfectly horizontal.

The hole or tube *j* of the bar-spindle is contracted at the center, (see Fig. 5,) producing a shape similar to an hour-glass. The level-body A, on its lower side, has a screw-eye, *k*, or similar device at the center, and a cord, *l*, is attached thereto and passes down through the hole or tube *j* in the bar-spindle, and has at its lower end a plumb-bob, *l'*. The shape of the hole *j* allows the cord *l* to vibrate sufficiently. It will be seen the instrument will be effectually leveled in a crosswise direction by the weight of the plumb-bob, and when the body A has been leveled in a longitudinal direction by the adjustment of the thumb-screws *e''* the plumb-bob will indicate on the ground the central vertical line from the level-body A downward.

The plumb-bob has at its lower end a point, and around its sides has several circumferential ribs, *m*, spaced one inch apart. These are useful, as they serve, when the length of cord *l* is known, to denote the number of inches from the sight-line between the two bosses B C down to the surveyor's stake *l'*, set in the ground.

The upper end, *p*, of each leg G enters the socket *f* of the tripod-head, and just below the said upper end the leg has a curve, *q*, whereby the said end *p* takes a different direction from the rest of the leg. The bores of the

three sockets *f* in the tripod-head are parallel, or all three extend in the head in the same direction. Thus the upper ends, *p*, of the legs are parallel; but the curve *q*, just below said upper ends, allows the three legs to be spread apart and form a sort of pyramid-stand to support the level-body A. The set-screws *f'* will retain the legs in this position.

When it is desired to carry the instrument some distance, the legs may be put in a more compact shape, and thereby facilitate its being carried, by loosening the set-screws *f'* and turning the legs, while their ends *p* remain in the sockets *f*. As each leg has a curve, *q*, below the socket, the effect of turning them, as stated, will be to bring all of the legs close together and in a parallel position, as shown in Fig. 7. Of course the tripod-head E will now be inclined with respect to the legs, as shown. When the legs are thus parallel and close together, the instrument may be readily carried.

The target consists of a rod, H, and a block, L, provided with a clamp to slide on the rod. The lower end of the rod is pointed and has a staple or loop-eye, *r*, projecting horizontally from one side. This staple I call "indicator." One side of the rod has graduated marks indicating inches. These commence with 1 at the lower end and extend upward.

The target-block L has top and bottom edges *s*, which are parallel, and each side edge has two points, *t*, a V-notch, *t'*, being cut in to form said two points. The front face of the block is colored, and the back has a metal clamp-frame, J, which straddles the rod H loosely, so that the block is free to be moved up and down on the rod. The clamp-frame has a central pointer, *u*, which passes over the graduated marks on the rod, and also has in its back a set-screw, *v*. A metal plate, *w*, fits loosely under the back of the clamp-frame J and is in contact with the rod H. This plate has at each end a lug or flange, *x*, which takes on the top and bottom of the clamp-back and retains it to its position. The end of the set-screw *v* bears on the said plate *w*, and thereby the block L may slide easily and be set firmly on the rod at any position and not injure the rod.

The manner of using the instrument will be readily understood. The level-body A must be leveled by means of the thumb-screws *e'* and plumb-bob, and the target H L set up with its point at a stake, and then the body A turned to bring its sights in position for viewing the target.

Having described my invention, I claim and desire to secure by Letters Patent of the United States—

1. A leveling-instrument having in combination a body provided with a spirit-level, sights, and two holes, *e*, entering at the lower side and extending upward, a tripod-head, and a bar, I, having at each end a vertical thumb-screw, *e'*, the upper ends of said screws loosely occupying the said holes in the body.

2. A leveling-instrument having in combination a body provided with a spirit-level, sights, and two holes, *e*, entering at the lower side and extending upward, a tripod-head, a bar, I, swiveled to the tripod-head, and two vertical thumb-screws, *e'*, one at each end of the swiveled bar, the upper ends of said screws loosely occupying the said holes in the body.

3. A leveling-instrument having in combination a body provided with a spirit-level, sights, and two holes, *e*, entering at the lower side and extending upward, a tripod-head, and a bar, I, having at each end a vertical thumb-screw, *e'*, the upper ends of said screws loosely occupying the said holes in the body, a tubular spindle, *h'*, connecting the tripod-head and said bar, and a plumb bob hung by a cord, *l*, which is attached to the said body and passes down through the tubular spindle.

4. A leveling-instrument having in combination a body provided with a spirit-level and sights, a tripod-head, a tubular spindle, *h'*, turning in the tripod-head, and a plumb-bob hung by a cord, *l*, which is attached to the said body and passes down through the tubular spindle.

5. A leveling instrument having in combination a body provided with a spirit-level and sights, a tripod-head, a tubular spindle, *h'*, turning in the tripod-head, and a plumb-bob having circumferential ribs *m* and hung by a cord, *l*, which is attached to the said body and passes down through the tubular spindle.

6. A leveling-instrument having in combination a body provided with a spirit-level and sights, a tripod-head having leg-sockets *f*, the bores of which are parallel, and legs G, the upper ends, *p*, of which enter the sockets, and each leg having a curve, *q*, just below the end part which occupies the sockets, whereby the legs may be spread to form a pyramid-stand, or may be turned in the sockets and brought close together and in parallel position.

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

EDWARD REICHENBACH.

Witnesses:

I. C. GRABILL,
H. H. STRAUSS.