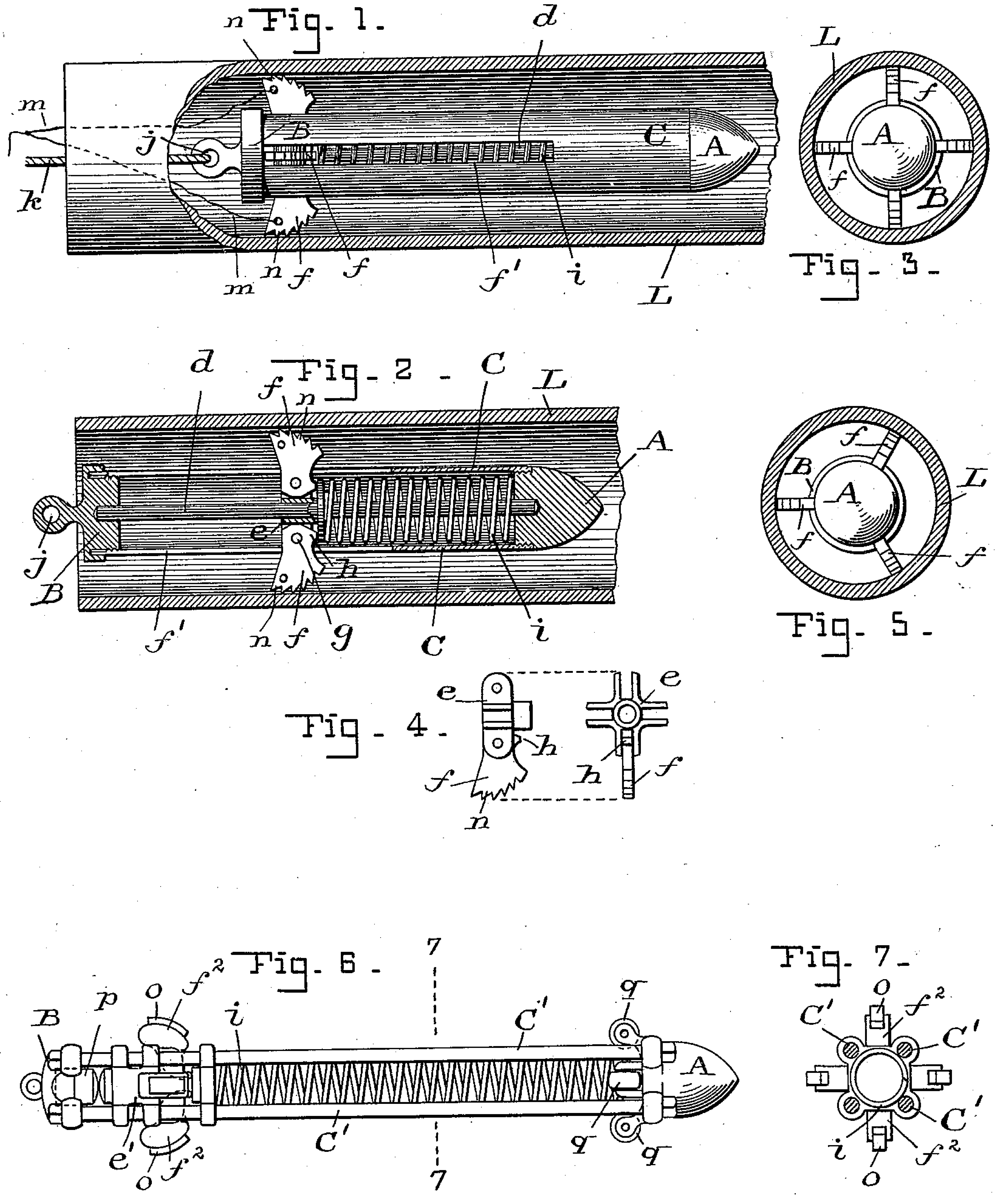
(No Model.)

P. C. VOLLAND.

DEVICE FOR PULLING ROPES THROUGH CONDUITS.

No. 549,757. Patented Nov. 12, 1895.



WITNESSES :-

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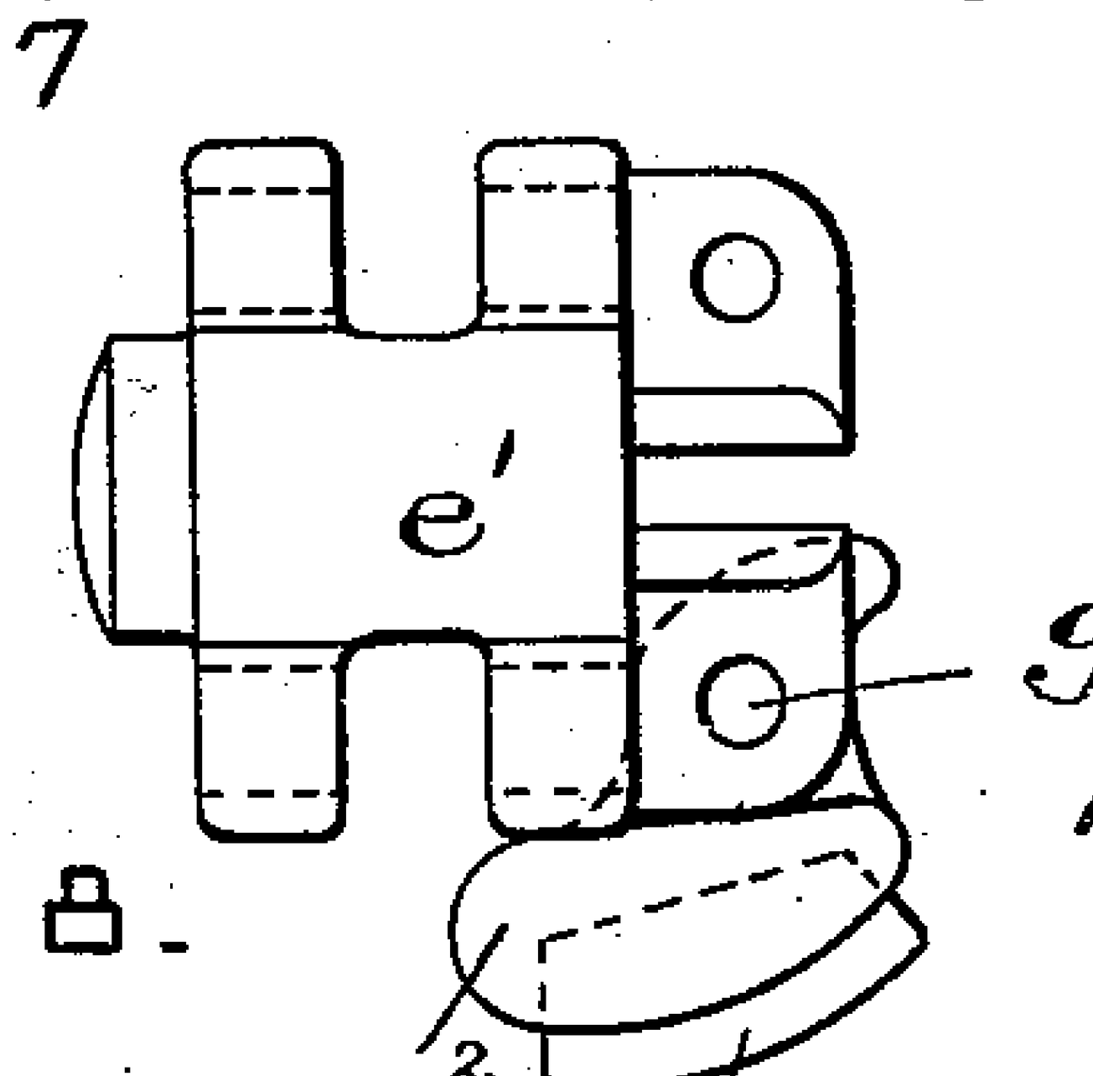

Fig. 8.

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PAUL C. VOLLAND, OF BALTIMORE, MARYLAND, ASSIGNOR OF TWO-THIRDS TO HEINRICH G. LEUTBECHER AND JONATHAN E. MOXLEY, OF SAME PLACE.

DEVICE FOR PULLING ROPES THROUGH CONDUITS.

SPECIFICATION forming part of Letters Patent No. 549,757, dated November 12, 1895.

Application filed July 15, 1895. Serial No. 556,050. (No model.)

To all whom it may concern:

Be it known that I, PAUL C. VOLLAND, a subject of the Emperor of Germany, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Devices for Pulling Ropes Through Conduits, of which the following is a specification.

This invention relates to a device for passing ropes, wires, or cables through pipes or conduits.

The object of the invention is to provide a device which may be inserted at one end of a pipe or conduit and which will pass through said pipe or conduit and pull a rope, wire, or cable through after it.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a view of the device inserted in a pipe and showing the primary or normal position of its parts. Fig. 2 is a sectional view of the device inserted in a pipe and showing the position of the parts when the spring is compressed and the device is ready to move forward. Fig. 3 is a cross-section of the conduit and an end view of the device, showing four cam-wedges. Fig. 4 shows two views of the sliding head with one cam-wedge only attached. Fig. 5 is a view like Fig. 3, showing a modification where only three cam-wedges are used. Fig. 6 shows a modification in the construction of the rope-puller. Fig. 7 is a cross-sectional view of same in the line 7 7, looking toward the left. Fig. 8 is a view, on a larger scale, of the sliding head of this modification with one cam-wedge only attached.

The letter A designates the prow end, and B the stern end. These two ends must be secured together by some suitable means to maintain them always in the same relative fixed position.

In Figs. 1 and 2 a tubular case C is employed to rigidly secure the two ends together; but other means may be used for this purpose. A central rod *d* is in the tube and extends from the prow end to the stern end. A head *e* is free to slide between the said two ends, and this head carries a plural number of cam-wedges *f*, each of which in the present instance is attached to the head by a pivot *g*. Any number of cam-wedges may be used. In the drawings I have shown in one instance four and in another three. Each cam-wedge has at its innermost end a heel *h*, and a washer-plate loose around the rod *d* bears against the heel of each and all of the wedges. A spiral spring *i* is interposed between the said sliding head *e* and the prow end. As here shown, the spiral spring bears against the washer and serves by its expansion to keep the sliding head and wedges normally in position near the stern end, as in Fig. 1. The spring causes pressure normally on all the heel ends of the pivoted cam-wedges, and thereby the outer ends of the wedges are normally tilted toward the point end or prow end of the device. The tube has slots *f'*, through each of which one of the cam-wedges projects. The stern end has an eye *j*, to which an operating cord or rope *k* is attached.

The operation is as follows: A device to be operative must be of a certain size relative to the size of conduit it is to be used with. When the device is inserted in a tube or conduit L, the outer ends of the cam-wedges will impinge loosely against the inner wall or surfaces of the conduit, as in Fig. 1. The operating-cord *k* is then pulled to compress the spring *i*, and this pulling on the cord will also cause the cam-wedges to firmly engage against the inner walls and thus prevent them and the head *e* from being drawn backward, the tube and rod sliding past the head *e* to the limit of the compression of the spring. Now, the spring being compressed, the operator will suddenly release the cord *k*, and thereupon the forcible relaxation of the spring will project or shoot the entire device forward in the conduit L. The extent of this projection will vary from, say, six inches to ten feet, depending on the conditions. The operation of compressing the spring and releasing suddenly may then be repeated again and again and thus advance the device step by step through a conduit of indefinite length. The operating-cord *k* is thus drawn through the conduit, and by then drawing on this rope from the terminal end of the conduit any wire or cable may be drawn through.

Each cam-wedge *f* may have a small cord or wire *m* attached to it, if desired. These cords *m* will serve, when the device is in a conduit and circumstances require that it be withdrawn or pulled back to the entrance end, to tilt the cam-wedges and release them

from impinging against the inner wall-surfaces of the conduit. By this means the device may be retracted or drawn back.

The cam-wedges in Figs. 1, 2, and 4 are shown with serrated edges *n*.

In Figs. 6, 7, and 8 are illustrated a modification in the construction of my device. The essential elements are the same and the mode of operation is the same as in the form of construction already described. In the modification the two ends A B are secured together by rods C′. No tubular case is employed and no central rod. A head *e′* in this modification slides on the rods C′ and carries the cam-wedges f^2, which are substantially the same as those in Fig. 1. The only difference between the cam-wedges consists in the fact that those in Figs. 6, 7, and 8 have rubber contact-blocks *o*, while those in Fig. 1 have burr edges or serrated edges *n*. The stern end has a block of wood or rubber *p* to serve as a cushion, against which the sliding head *e* or *e′* may strike when the spring relaxes. The point end of the device is provided with rollers *q*, which serve to support that end and travel along the conduit and reduce the friction when the device is projected forward.

The form of wedges here shown may be varied. The essential thing is to have them of such form that they will move so as to slightly contract, in order to enter the pipe or conduit, and then to move the reverse way, so as to slightly expand, in order to impinge against the inner surface of the pipe or conduit.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A device for passing ropes through conduits, comprising, in combination, a prow end; a stern end; a rod extending between said two ends; a head sliding on said rod; a number of cam-wedges pivoted only to the sliding head and each provided with projecting impinging faces to take against the wall of the conduit and with an inner heel end; a washer loose on said rod and bearing against the heel ends of all the cam-wedges; a spring surrounding the said rod and interposed between said sliding head and the prow end of the device; and an operating cord fixed to the said stern end.

2. A device for passing ropes through conduits, comprising, in combination, a prow end, A; a stern end, B, having an eye; a tubular casing connecting said two ends and provided with slots or openings in its sides extending longitudinally; a rod inclosed within said tube; a head sliding on said rod; a number of cam-wedges pivoted to the sliding head and each projecting through one of said slots and provided with an outer impinging face and at its inner end with a heel; a washer loose on the rod and bearing against the heels of all the cam-wedges; a spiral spring surrounding the said rod and interposed between said prow end and sliding head; and an operating cord attached to the said eye of the stern end.

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

PAUL C. VOLLAND.

Witnesses:
L. I. VAN HORN,
C. CALVERT HINES.