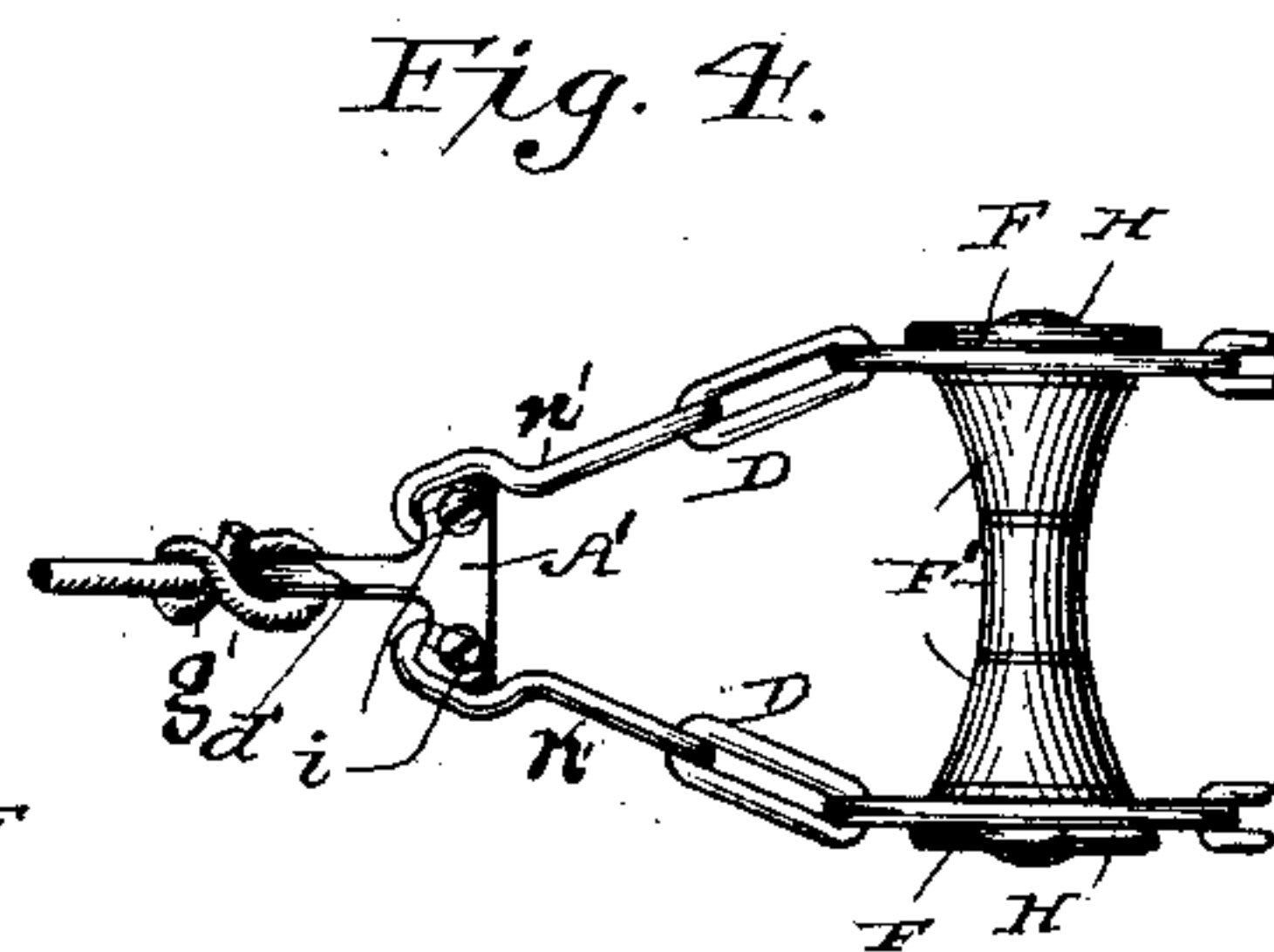
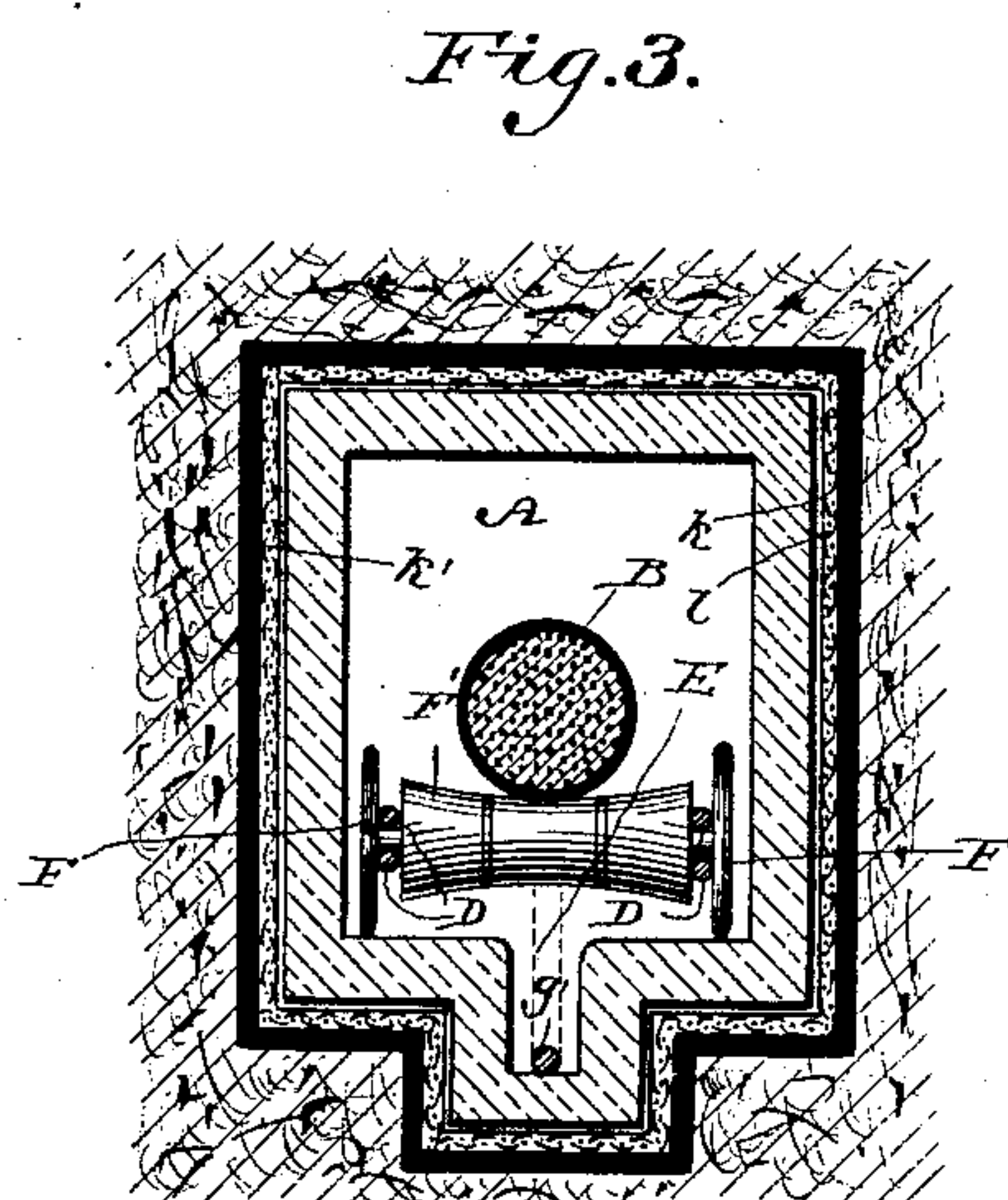
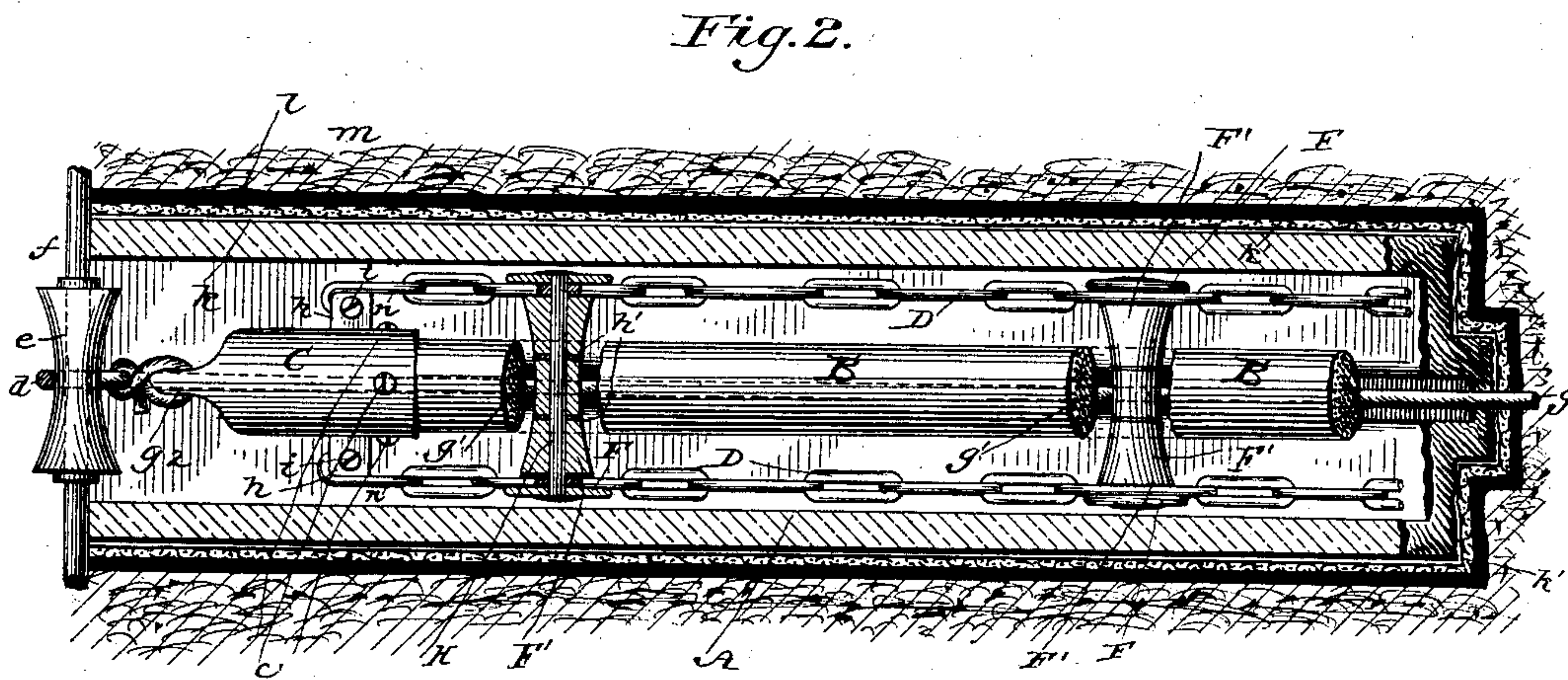
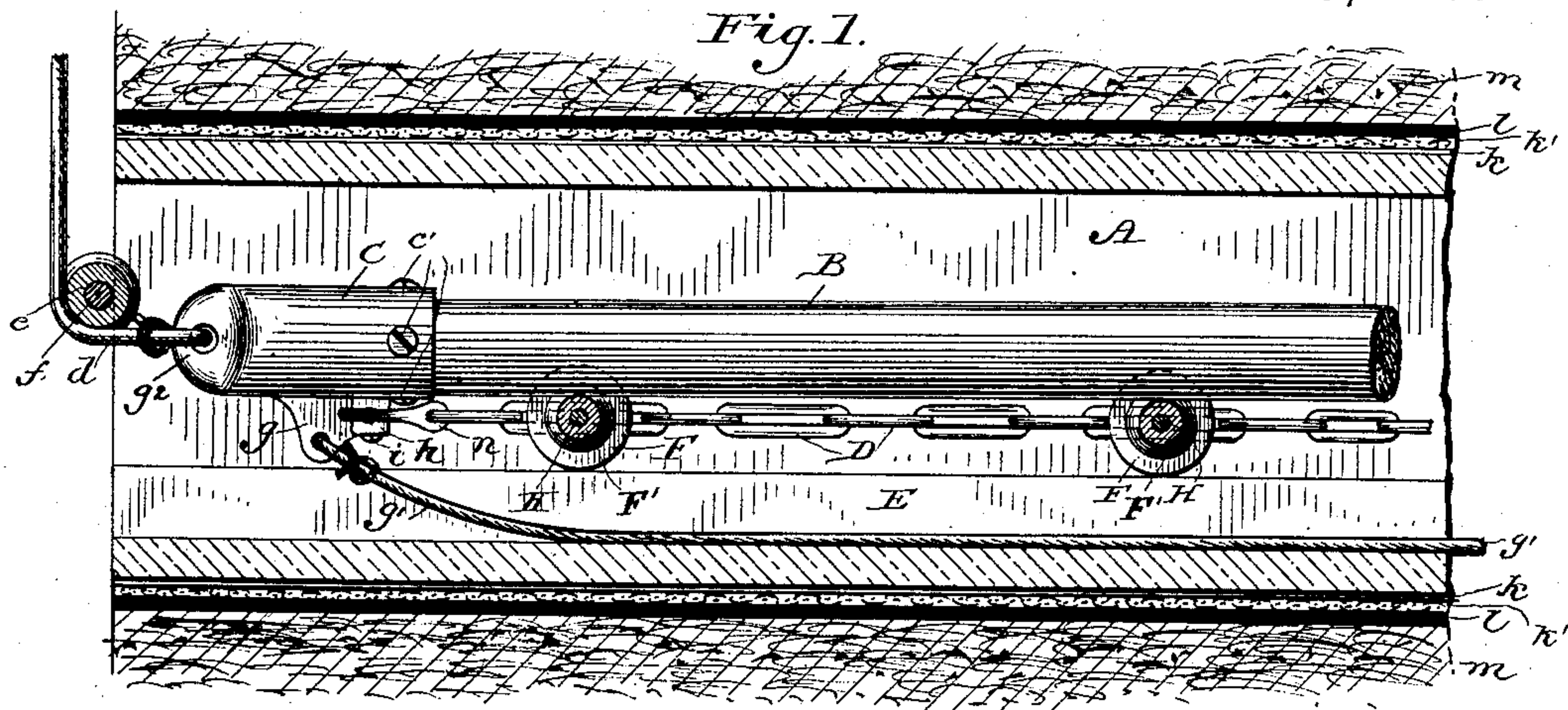


(No Model.)

J. F. MUNSIE.  
HAULING THROUGH CONDUIT SYSTEMS.

No. 371,965.

Patented Oct. 25, 1887.



Witnesses

*H. W. Elworth,*  
*E. S. Hutchins,*

Inventor  
*James F. Munsie.*

By his Attorney

*John C. Lennie.*



# UNITED STATES PATENT OFFICE.

JAMES F. MUNSIE, OF CHICAGO, ILLINOIS.

## HAULING-THROUGH CONDUIT SYSTEM.

SPECIFICATION forming part of Letters Patent No. 371,965, dated October 25, 1887.

Application filed December 30, 1886. Serial No. 223,009. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES F. MUNSIE, a subject of the Queen of Great Britain, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Hauling-Through Conduit Systems; 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.

My invention is designed, principally, to facilitate the insertion of electric cables into underground conduits and insure their ready removal therefrom, the operations being effected with the expenditure of comparatively little force, with celerity, and without undue wear upon the external coating or envelope of the cables themselves, or upon the inner surface of the conduits employed. In the accomplishment of these purposes I have devised the construction and arrangement of parts illustrated in the accompanying drawings, wherein—

Figure 1 represents a central vertical longitudinal section of my improved conduit and its appurtenances, illustrating the location of the various parts after insertion of the cable. Fig. 2 represents a horizontal longitudinal section of the same. Fig. 3 represents a vertical cross-section thereof, and Fig. 4 represents a detached plan view of the removable cable-bed prior to employing the same for the removal of the cable.

Similar letters of reference indicate similar parts throughout the several views.

The conduit itself is composed of a series of conduit-sections, as A, all preferably of equal length and having a longitudinal chamber, E, at their lower portion, as shown. Externally the sections A, which may be of glazed earthenware or the like, are enveloped first in a cover of paper, *k*, outside of which is a further envelope or covering of wire-gauze or the like, *k'*, protected from the moisture of the earth, *m*, by an intermediate layer of asphalt, tar, or equivalent substance. The presence of the paper envelope *k* prevents any possible moisture from the interior of the conduit striking the wire-gauze, and the paper and asphalt covering combined prevent the access of moisture from the earth to the interior of the conduit.

I do not claim herein the construction described for protecting the conduit from penetration of moisture from without and for grounding induced currents, as such construction is made the subject-matter of a separate application filed by me March 9, 1887, Serial No. 230,216.

The insertion and removal of the electric cable is effected by means of the cable-bed illustrated in the drawings. This consists, primarily, of a series of rollers connected together by the chain D or the like, so as to be adapted to be wound upon a windlass, reel, or drum. Each of these rollers consists of a central shaft, H, bearing at its outer ends the revoluble rollers F and the intermediate loose spools, F', capable of independent rotation with respect to each other and separated by intervening washers *h'*. The extreme ends of the chains terminate in half links or hooks *n*, as shown. At the end of the conduit is located a sheave, *e*, mounted upon a shaft, *f*.

In the operation of inserting a cable, as B, within the underground conduit, I avail myself of the device C, consisting of a metallic cap hollowed out internally and provided with the perforated projection *g*<sup>2</sup>, for attachment of a hauling-rope, *d*, the lower perforated lug, *g*, for the attachment of a trailing cable, *g'*, and the side lugs, *h h*, for the reception of the half-link ends *n* of the chains, said half-links being retained therein by means of the binding-screws *i*. The cable B is retained within the hollow cap *c* by means of the binding-screws *c'*, or their equivalents.

In carrying out my invention the rope *d*, which is originally contained within the chamber E, is connected with the bail *g*<sup>2</sup> of the piece C. The cable, the chains, and the trailing rope *g'* are connected to the piece C, as illustrated in Fig. 1, and the rope *d* is thereupon hauled through the conduit-section, drawing after it the cable, trailing rope, and removable cable-bed. During this operation the wheels F of the removable cable-bed rotate, thereby insuring the rapid passage of the cable through the conduit with comparatively small expenditure of power and without injury to the interior surfaces of the conduit. When the cable is completely drawn through the section, the cable itself and the rope *g'*



are detached from the piece C, whereupon the roller-bed is drawn out from under the cable and wound upon a reel or the like for future use. The cable itself rests within the conduit above the chamber E, the upper corners or edges of said chamber being rounded off, as shown, so as not to abrade the cable-covering. The chamber E, it will be noted, communicates with the main body of the conduit by an opening of less width than the diameter of the conducting-cable, thereby preventing said cable from falling into the chamber E, so as to interfere with the trailing rope *g'*.

When it is desired to remove the cable from the conduit, one end of the trailing rope *g'* is connected to the removable cable-bed, as illustrated in Fig. 4, and by means of the said rope the cable-bed is drawn beneath the cable until it supports the latter throughout its entire extent. The cable may then be withdrawn by hauling it through the conduit over the surface of the cable-bed, whose intermediate rollers revolve during such hauling operation, thereby taking off all strain from the cable-envelope. The roller-bed may then be removed, as before.

In constructing new systems in accordance with my invention I prefer to have all the conduit-sections of substantially equal length, so that the same length of roller-bed and trailing rope will suffice for each. It is obvious, however, that the invention may be applied to sections of unequal length with like good results.

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

1. In a conduit system for electric conductors, the combination, with the conduit and the cable, of a removable cable-bed for facilitating the insertion and removal of the cable, substantially as described.

2. In a conduit system for electric conductors, the combination, with a hauling-cable provided with means for connecting the electric cable therewith, of a removable roller-bed, substantially as described.

3. In a conduit system for electric conductors, the combination, with a hauling-cable provided with means for connecting the electric cable therewith, of a removable roller-bed and a trailing rope, substantially as described.

4. In a conduit system for electric conductors, the combination, with a hauling-cable, of a removable roller-bed having carrier-wheels and independently-revolving intermediate spools, substantially as described.

5. In a conduit system for electric conductors, the combination, with a trailing rope, *g'*, electric cable B, and removable roller-bed D, of the piece C and hauling-cable *d*, substantially as described.

6. An underground conduit provided with a longitudinal chamber, E, communicating therewith by an opening of less width than the diameter of the cable contained in the conduit, and a rope located within said chamber E, substantially as described.

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

JAMES F. MUNSLIE.

Witnesses:

JOHN C. PENNIE,  
E. T. WHITE.