

No. 630,697.

Patented Aug. 8, 1899.

J. S. HIGHFIELD & J. McI. CATER.
ELECTRICAL CONDUCTING MAIN.

(Application filed May 16, 1899.)

(No Model.)

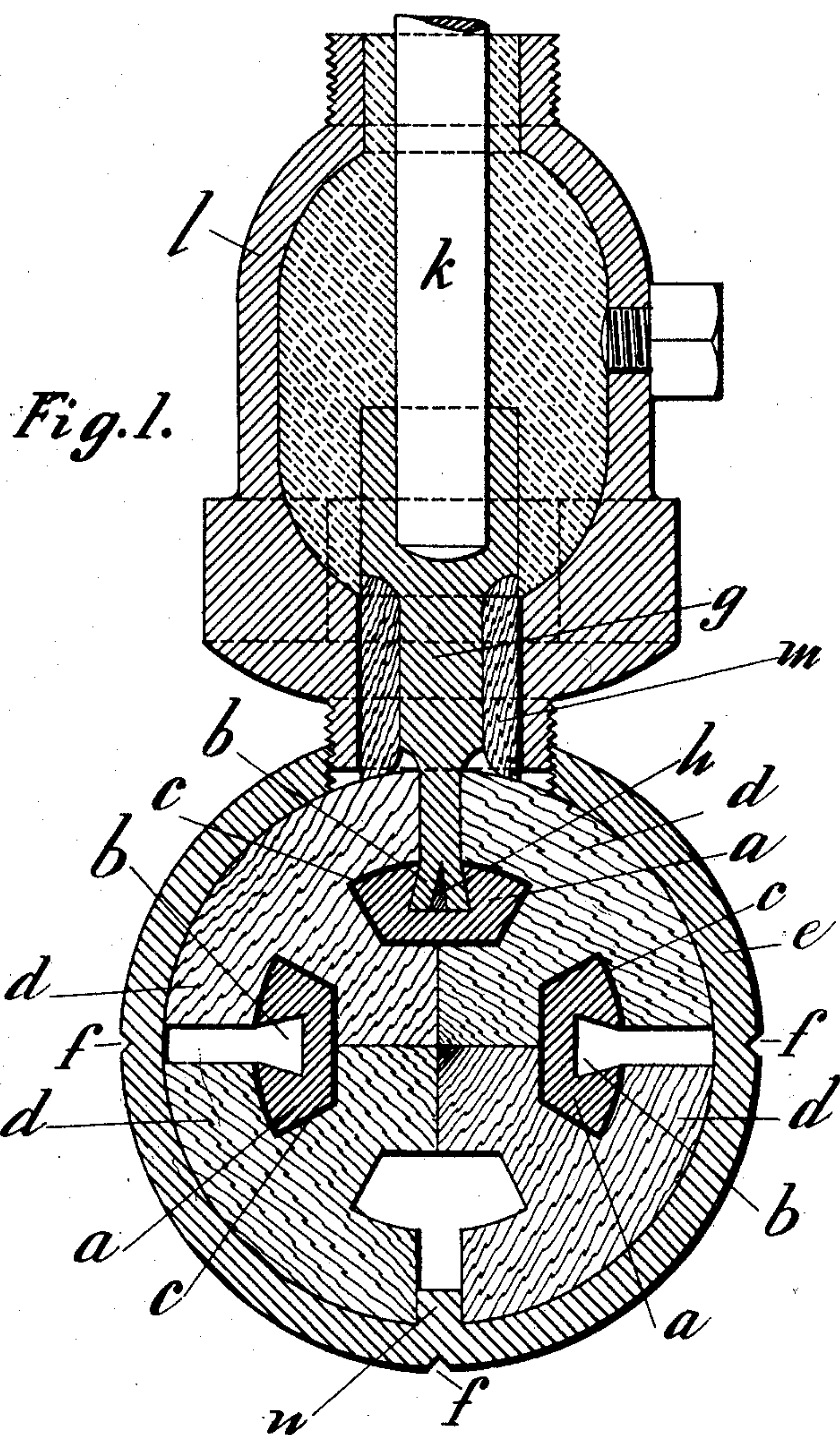
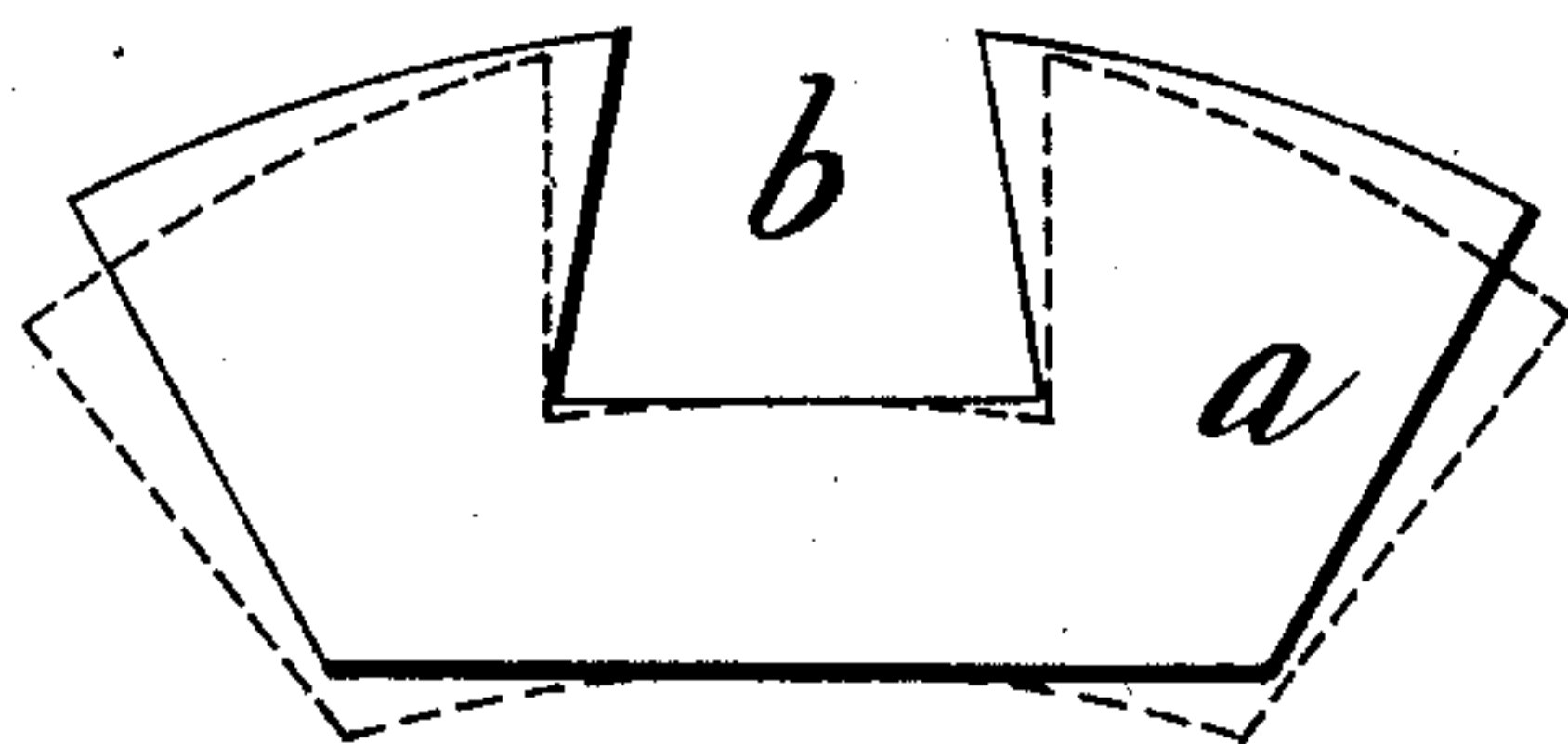


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN SOMERVILLE HIGHFIELD, OF ST. HELENS, AND JOHN McILVAINE
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ELECTRICAL CONDUCTING-MAIN.

SPECIFICATION forming part of Letters Patent No. 630,697, dated August 8, 1899.

Application filed May 16, 1899. Serial No. 717,066. (No model.)

To all whom it may concern:

Be it known that we, JOHN SOMERVILLE HIGHFIELD, residing at No. 34 Wolseley road, St. Helens, Lancaster county, and JOHN McILVAINE CATER, residing at Southdown, The Downs, Wimbledon, London, Surrey county, England, citizens of England, have invented certain new and useful Improvements in Electrical Conducting-Mains, (for which we have applied for a patent in Great Britain, dated October 21, 1898, No. 22,181,) of which the following is a specification.

Our invention relates to the construction and arrangement of underground electrical conductors in such a manner that they are well insulated and well protected and that connections can be readily made to them at any part of their length.

The invention consists in the construction and the combination or arrangement of parts hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a transverse section of a set of conductors according to this invention adapted for an installation on the three-wire system, a connection to one of the lines being shown in position; and Fig. 2 is a detail end view of one of the dovetailed conductors, the dotted lines indicating the form of the conductor prior to bending it into the form shown by full lines.

Each of the conductors *a* is a metal bar of approximately trapezoidal section having a dovetail groove *b* formed along its whole length. This may be done by first rolling the bar to a shape such as is shown by dotted lines in Fig. 2, with a groove which is not dovetailed, and then passing this bar through between rollers, which bend it laterally, so as to bring the outer edges of the groove nearer to one another, thus forming the dovetail. The three bars covered with a layer *c* of any suitable insulating material are packed between bars *d*, of wood, cut to suitable shapes within a metal pipe *e*, which has along its exterior a slight groove *f*, directly facing each of the dovetail grooves.

When it is desired to make a connection to any one of the conductors, a hole is bored through the metal of the pipe, the center of

the hole being in the groove *f*, and therefore in line with the middle of the dovetail groove of the conductor. The hole is internally screw-threaded. A connecting-piece *g*, having its end split, and a wedge *h*, inserted in the split, is then driven in, and the wedge being thus forced up the split expands the sides of the split, so as to make them fit and hold firmly in the dovetail. Around the stem of the connecting-piece *g* a wooden sleeve *m* is put on in halves, a conducting branch *k* being soldered into the socket end of the connecting-piece *g*, and this piece being coated with insulating material. An inclosing socket *l*, lined with insulating material where it surrounds *m*, is screwed into the hole of the pipe *e* and its interior is filled around *g* with molten insulating material, such as pitch.

The pipe *e* is preferably made with an internal rib *n* to prevent the conductors from turning around within it.

When the pipe *e* is used as a return-conductor or middle wire or when the line is on the two-wire system, one of the bars is dispensed with. When two pairs of conductors are required, a fourth bar *a* can be introduced where the space is shown empty, the four conductors being then arranged symmetrically. Successive lengths of pipe *e* with conductors arranged in them being placed end to end, with the conductors projecting beyond their ends, the conductors can be connected by sleeves soldered on them, and these connections being covered with insulating material the pipes can be joined by screw-sockets or otherwise.

Having thus described the nature of this invention and the best means we know of carrying the same into practical effect, we claim—

1. An underground electric conducting-line, consisting of a series of dovetail-grooved metal bars each coated with suitable insulating material and having their dovetail grooves facing outward, wooden bars arranged between said metal bars and their dovetail grooves, and a metal pipe inclosing said bars and having an external groove extending opposite the dovetail grooves of the metal bars, substantially as described.

2. The combination of a conducting-bar having a dovetail groove in its outer side,

packing about said bar, a metal pipe inclos-
ing the bar and packing, a conducting con-
necting-piece split at its inner end, and a
wedge in the split end to expand the latter in
5 the dovetail groove of the bar when the con-
necting-piece is inserted through an opening
in the pipe and its split end forced into the
said dovetail groove, substantially as de-
scribed.

In testimony whereof we have hereunto set to
our hands in presence of two subscribing wit-
nesses.

JOHN SOMERVILLE HIGHFIELD.
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Witnesses:

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