

No. 631,177.

Patented Aug. 15, 1899.

H. W. RANK.
JAR FOR WELL DRILLING TOOLS.

(Application filed Feb. 9, 1899.)

(No Model.)

Fig. 1.

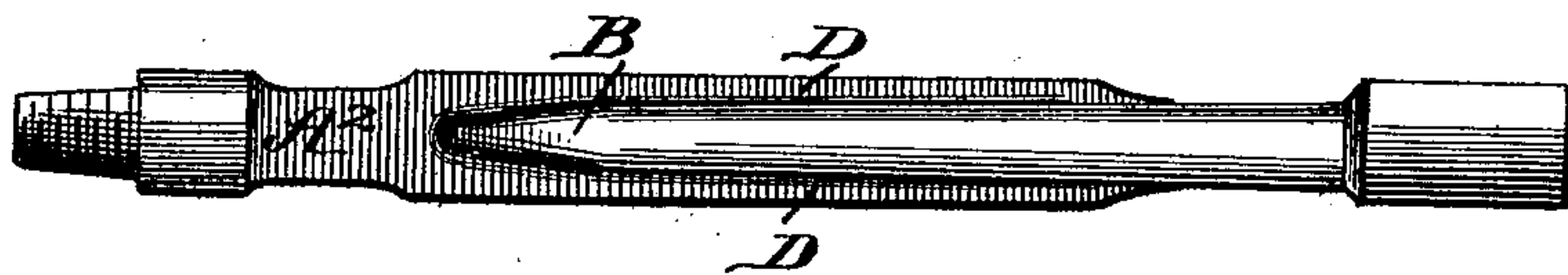


Fig. 2.

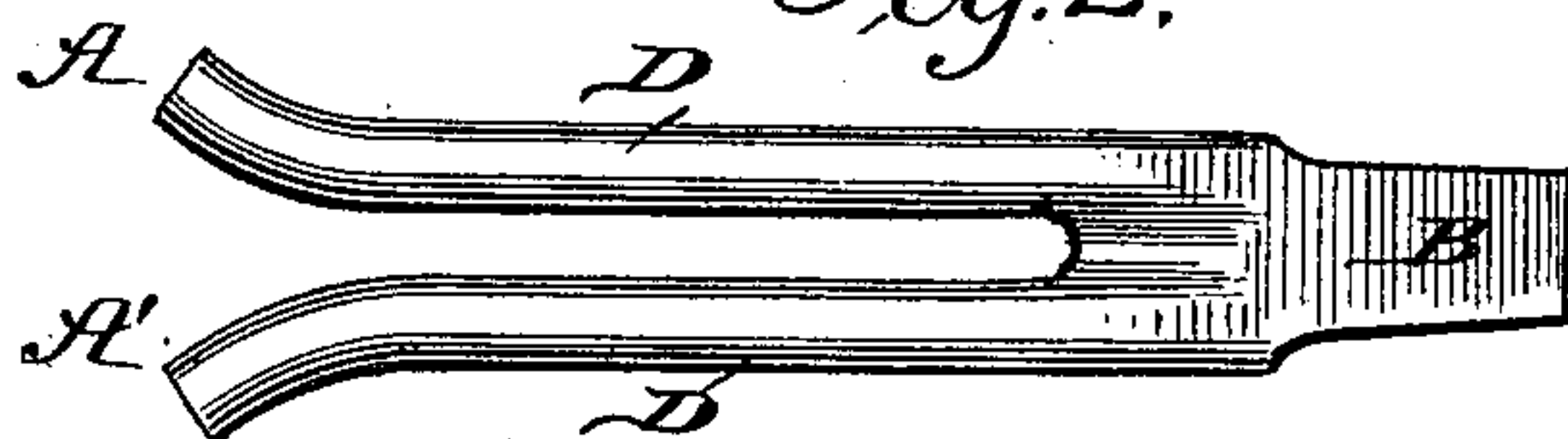


Fig. 3.



Fig. 4.

Fig. 4^a

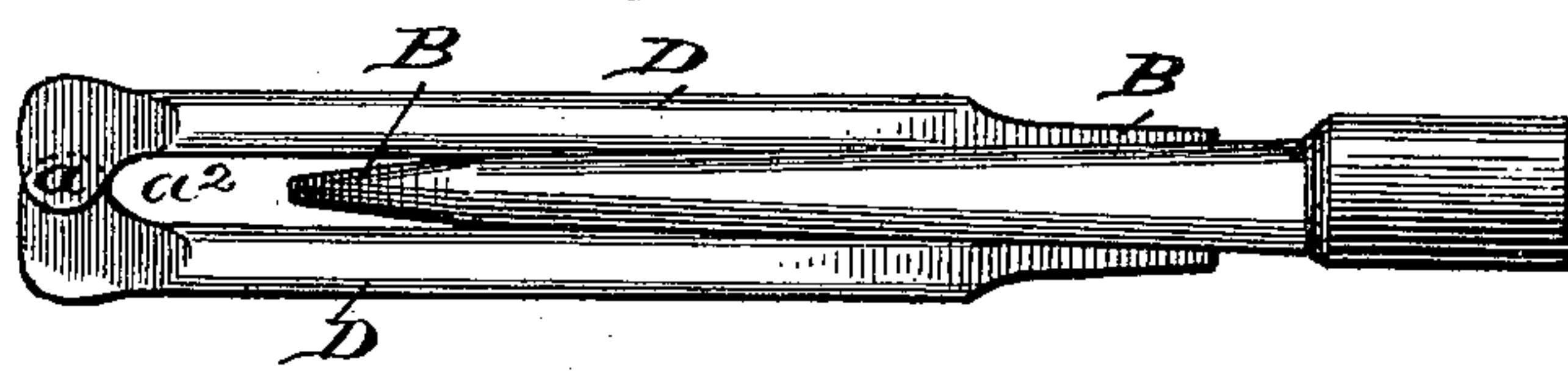
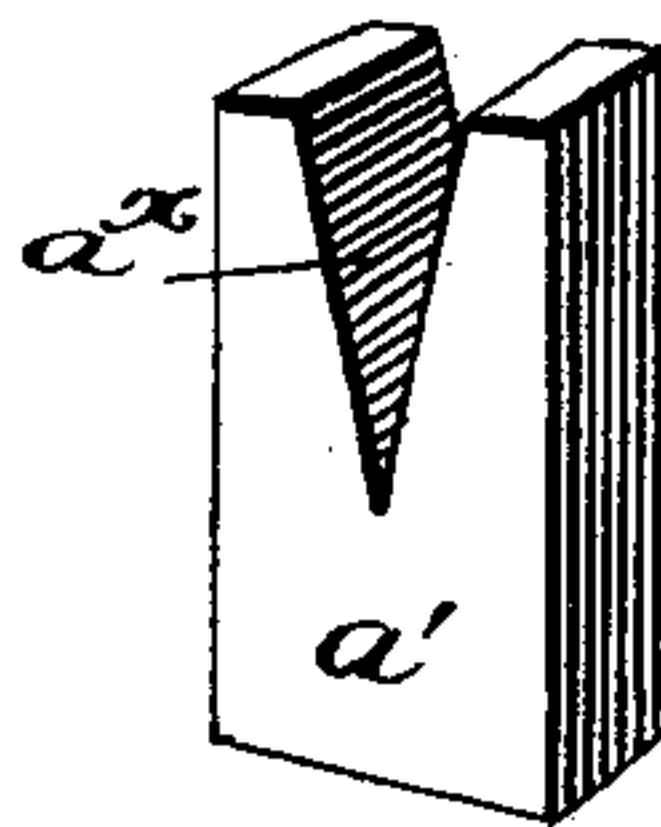
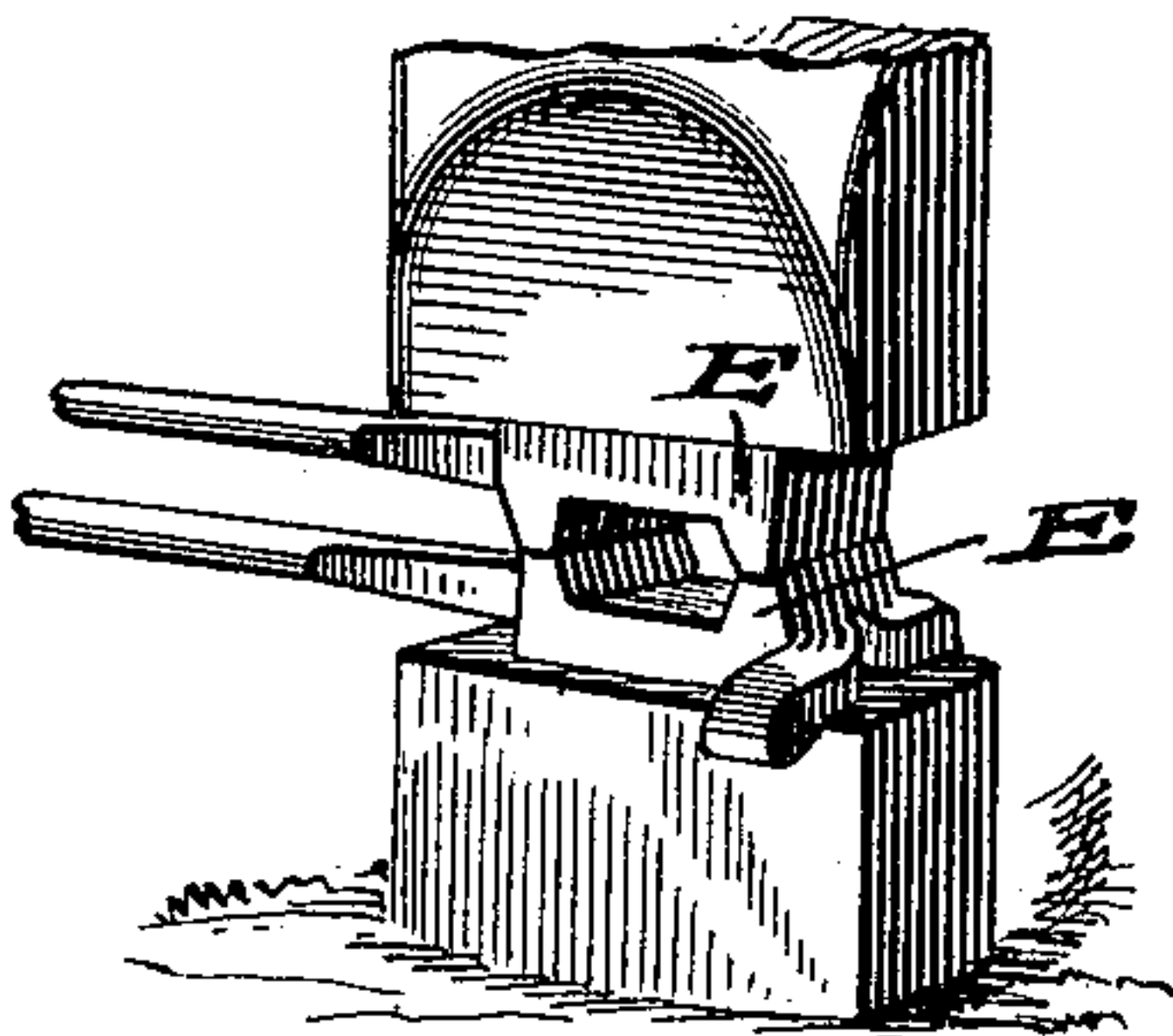


Fig. 5.



WITNESSES:

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HARRY W. RANK, OF McDONALD, PENNSYLVANIA.

JAR FOR WELL-DRILLING TOOLS.

SPECIFICATION forming part of Letters Patent No. 631,177, dated August 15, 1899.

Application filed February 9, 1899. Serial No. 705,026. (No model.)

To all whom it may concern:

Be it known that I, HARRY W. RANK, of McDonald, in the county of Washington and State of Pennsylvania, have invented a new and useful Improvement in Jars for Well-Drilling Tools, of which the following is a specification.

My invention relates to improvements in jars employed in connection with apparatus for drilling wells for the purpose of knocking or jarring the drill loose whenever it happens to become fast in the rock or the like. As is well known, these jars consist of two parts like long links of a chain, being slotted and one having its cross-head passing through the slot of the other. They are usually placed between the sinker-bar and auger-stem and give an upward blow to the latter with every stroke, so as to jar the drill to prevent it from sticking. It is obvious that considerable strain and wear are put upon the jars in their operation; and the object of my invention is to produce jars that will withstand the strain and last a considerable time with a good degree of usefulness.

The invention consists in jars with certain characteristics which I shall first describe and then point out in the appended claim.

Reference is to be had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side view of the jars as completed. Fig. 2 is a side view of one link ready to be tempered. Fig. 3 illustrates the means whereby the temper of the knocking-head of the link is let down to the proper degree of hardness. Fig. 4 is a side view illustrating the overlapping edges of the ends of the link ready to be welded. Fig. 4^a is a perspective view of a cap used to fit over the said ends when they are being welded, and Fig. 5 is a perspective view of the swages and the steam-hammer used in welding.

In order to fully understand the peculiar features of my improved jars, it will be necessary to describe how they are made.

I first take a bar of steel or other suitable material of required size and shape ready to be forged and split it and swage it into the form shown in Fig. 2, in which the ends A A' designate what is afterward formed into the connecting end of one member or link of the

jars. (Shown at A² in the completed device illustrated by Fig. 1.) The opposite end B in Fig. 2 is formed into the knocking-head of one member. After a link of the jars is made into the shape illustrated in said Fig. 2 I toughen it by heating it to redness and chilling it in a bath of water, oil, mercury, or the like, preferably using oil, so that the steel will not cool too suddenly. The link is too brittle, however, at this stage of the process for the hard use to which it is to be put, and I let it down somewhat by drawing the temper with two pieces of hot iron C C', as shown in Fig. 3, until the proper temper is reached. The piece of steel has now become especially adapted for its work, because, referring to Fig. 1, it will be seen that the knocking-heads of the jars when treated according to the steps of the process just described above have become very hard, while the side pieces or "reins" D have had their temper drawn to the best possible toughness to withstand any sudden blow or strain, leaving the knocking-head as hard as possible to stand the wear and bruising strain, but not so hard as to be brittle.

When two links of the jars have been treated as described above, they are fitted together, as shown in Fig. 4, and their outer ends A A' are escarped, as shown at *a*, by being put under the hammer and drawn to a tapering edge, the side edge of one end overlapping the adjacent side edge of the other end. The said ends are then put in a cap *a'* with a V-shaped groove *a^x* and placed in the swages E E' (shown in Fig. 5) and welded. By reason of the overlapping edges of the tapered ends a specially-strong weld is made and the links are not liable to split at the crotch *a²*. (See Fig. 4.) The crotch *a²* is then cut out and the ends fitted with couplings for connection with the rope-socket or sinker-bar and the auger-stem of the drilling apparatus.

I have found that jars manufactured in accordance with my invention are especially adapted for the use to which they are put. The side pieces or reins D are tempered and drawn to the best possible toughness to withstand the longitudinal strain, while the knocking-heads are harder, to stand the wear and jar of bumping together. Further, by overlapping the ends of the links, as shown in Fig. 4, before such ends are welded they

are best able to withstand the splitting strain to which they are subjected at the crotch a^2 when the links are moved together.

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

The herein-described jars for well drilling or fishing tools, consisting of the interlocked links each of which is formed of a solid inte-
10 gral piece of highly-tempered material the

side pieces or reins of said links having their temper let down slightly, whereby the knocking-heads are left very hard to withstand the battering and the said reins are toughened to withstand the tensile strain, as and for the 15 purpose set forth.

HARRY W. RANK.

Witnesses:

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