No. 778,169. PATENTED DEC. 20, 1904.

C. H. T. BRINK.

CRANK AXLE, AXLETREE, OR THE LIKE.

APPLICATION FILED DEC. 24, 1903.

NO MODEL.

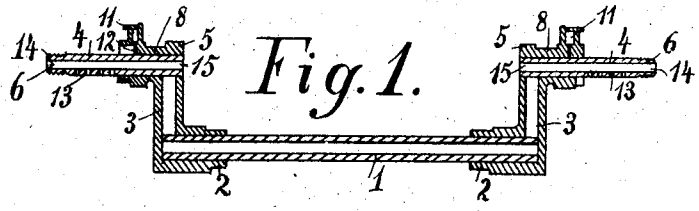


Fig. 1.

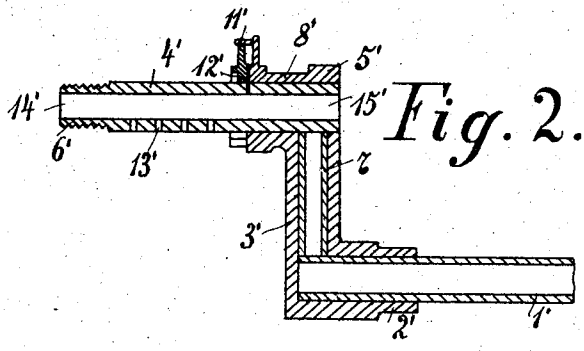


Fig. 2.

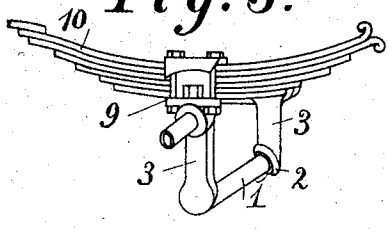


Fig. 3.

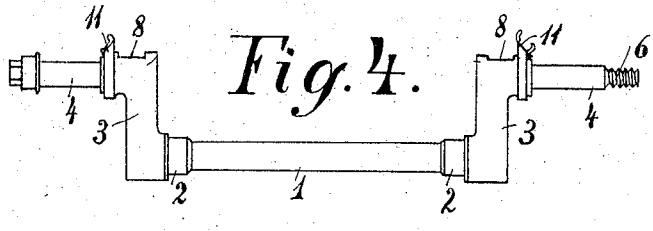


Fig. 4.

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A. Romney.

R. Fitton.

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No. 778,169. Patented December 20, 1904.

UNITED STATES PATENT OFFICE.

CARL HEINRICH THEODOR BRINK, OF WAHLERSHAUSEN, NEAR CASSEL, GERMANY.

CRANK-AXLE, AXLETREE, OR THE LIKE.

SPECIFICATION forming part of Letters Patent No. 778,169, dated December 20, 1904.

Application filed December 24, 1903. Serial No. 186,462.

To all whom it may concern:

Be it known that I, CARL HEINRICH THEODOR BRINK, a citizen of the Empire of Germany, residing at Wahlershausen, near Cassel, in the Empire of Germany, have invented certain new and useful Improvements in Crank-Axles, Axletrees, or the Like, of which the following is a specification.

My invention relates to crank-axles, axletrees, and similar articles; and its object is to provide a construction of maximum strength with a minimum weight, which may be cheaply manufactured, easily repaired, and of general high efficiency.

To this end the invention includes the combination and arrangement of component parts to be hereinafter described, and particularly pointed out in the claims.

While the invention is susceptible of modification, the accompanying drawings fully disclose the preferred embodiment thereof.

In the drawings, Figure 1 is a vertical longitudinal section through a cranked axletree. Fig. 2 shows, on an enlarged scale, a vertical longitudinal section through the left half of a modified axletree. Fig. 3 is a perspective view of the cranked axletree shown at Fig. 1 in combination with a carriage-spring, a part of the front bar being broken away; and Fig. 4 is an elevation of the axletree shown at Fig. 1.

Similar characters of reference refer to similar parts throughout the several views.

In manufacturing the illustrated exemplification of my axletree a steel tube 1 is forced with its two ends into the corresponding hollow ends 2 2 of two castings 3 3, whereby the tree proper is formed. Two short steel tubes 4 4 are then forced into the naves 5 5 of the two castings 3 3 and form the bars on which the wheels are mounted to turn. The steel tubes 1 4 4 are preferably drawn, but they may also be made in any other known manner—for example, by the Mannesmann process. The intermediate steel tube 1 may be forced in its cold state into the two castings 3 3, while the naves 5 5 of the two castings 3 3 require to be made hot before the two external steel tubes 4 4 are forced into them, so as to protect them from getting loose under the action of the torsion of the wheels. It will be seen that only two parts of the cranked axletree—viz., the two naves 5 5—need be made hot, which means a saving in labor and cost as in opposition to the ordinary solid wrought-iron cranked axletrees requiring several heats. The two external steel tubes 4 4 may be turned and screw-threaded on the ends 6 6 before they are forced into the castings 3 3. They may also be left unturned and simply screw-threaded on the ends. Thereby the manufacture of the entire axletree is also facilitated and cheapened. In order to enable the two external tubes 4 4 to be easily withdrawn when worn off, preferably the naves 5 5 of the castings 3 3 are bored through, as shown. The withdrawn worn steel tubes 4 4 (or bars) can be replaced by fresh steel tubes. Thus the repair of the axletree is rendered easy and cheap. As the internal steel tube 1 is not subjected to any wear and tear, it need not be replaced.

The castings 3 3 are assumed to be throughout hollow; but they may also be solid between the ends and the naves, or they may be left hollow by casting the metal around a tube 7, as is shown in Fig. 2, where the corresponding parts of the axletree are marked with the same characters of reference as before, only that the index 1 has been added. The naves 5 5 of the two castings 3 3 may be recessed at 8 8 and provided with flanges 9 9 for fastening them on the carriage-springs 10 in any known manner.

The cavities of the two external steel tubes 4 4 may serve as oil-chambers in any known manner, the castings 3 3 being provided with lubricating-boxes 11 11 and holes 12 12 and several holes 13 13 being conveniently drilled through the tubes 4 4, while the end openings 14 15 of the latter are blocked up in any known manner. Then the oil will flow through the holes 13 13 to lubricate the wheel-naves.

The axletree described so far can be varied in its details without deviating from the spirit of my invention.

It is evident that the weight of the cranked axletree produced according to my method will be reduced by upward of forty per cent.,

as in opposition to the ordinary solid wrought-iron cranked axletrees.

Obviously cranked axles or shafts of any known description can also be produced according to my invention, the essential point being that their arms are castings of malleable toughened cast-iron or steel and that the parts of the shafts proper and the pins or corresponding parts are steel tubes forced into suitable openings of the castings. When the cranked shaft is intended to carry gear-wheels, belt-pulleys, rope-pulleys, or other parts, it is preferable not to fasten these parts on the steel tubes representing the shaft proper by means of keys, but to secure them on conical thicker parts of the tube or on conical sleeves in halves placed on the steel tube, so as to avoid a weakening of the shaft.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. An axletree, comprising hollow cast crank-sections having barrels extending laterally from corresponding ends of the same and naves extending laterally from their opposite ends, said ends having openings forming continuations of the bores of the naves, a tube held at its opposite ends in said barrels, and other tubes fitted at one of their ends in the openings in the naves and having portions projecting beyond the same to provide journals, substantially as described.

2. An axletree, comprising hollow cast crank-sections having barrels extending laterally from corresponding sockets of the same and naves extending laterally from their opposite ends, said ends having openings forming continuations of the bores of the naves, a tube held at its opposite ends in said barrels, and other tubes fitted at one of their ends in the openings in the naves and having portions projecting beyond the same to provide journals, said naves having oil-pockets in the same and said other tubes having openings leading through their walls and registering with said oil-pockets and other oil-distributing openings, substantially as described.

3. An axletree, comprising hollow cast crank-sections having barrels extending laterally from corresponding ends of the same and naves extending laterally from their opposite ends, said ends having openings forming continuations of the bores of the naves, a tube held at its opposite ends in said barrels, other tubes fitted at one of their ends in the openings in the naves and having portions projecting beyond the same to provide journals, and tubes extending lengthwise of each section, substantially as described.

4. A crank-shaft, comprising a hollow crank-section having a laterally-extending barrel projecting from one end of the same and an oppositely-extending nave at its other end, said section having an opening through the same in register with the bore of the nave, and sheet-metal tubes held at their ends in the barrel and nave respectively and extending from the section in different directions, substantially as described.

5. A crank-shaft, comprising a hollow crank-section having a laterally-extending barrel projecting from one end of the same and an oppositely-extending nave at its other end, said section having an opening through the same in register with the bore of the nave, sheet-metal tubes held at their ends in the barrel and nave respectively and extending from the section in different directions, the tube held in the nave having an externally-threaded outer end portion, and an additional sheet-metal tube arranged in the major portion of the section, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CARL HEINRICH THEODOR BRINK.

Witnesses:

GEORG LEONHARD,

ADOLF BORNEMANN.