J. R. FLEMING.

AXLE RECONSTRUCTION.

APPLICATION FILED AUG. 8, 1918.

**1,340,032.** **Patented May 11, 1920.**

*Fig. 1,*

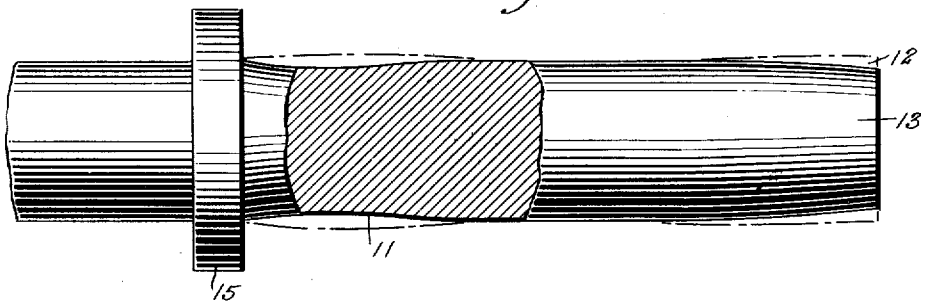



*Fig. 2,*

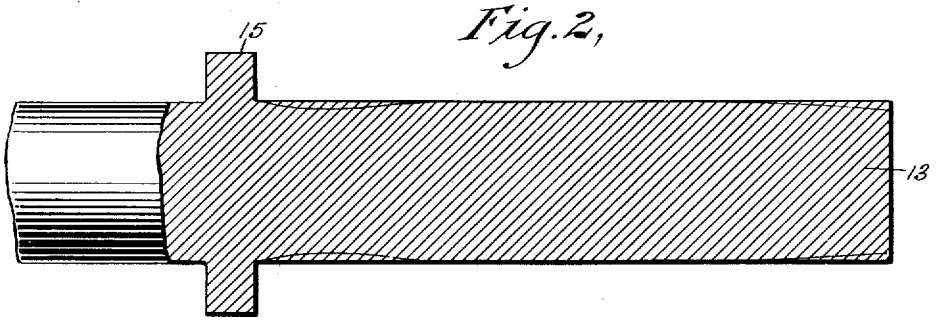



*Fig. 3,*

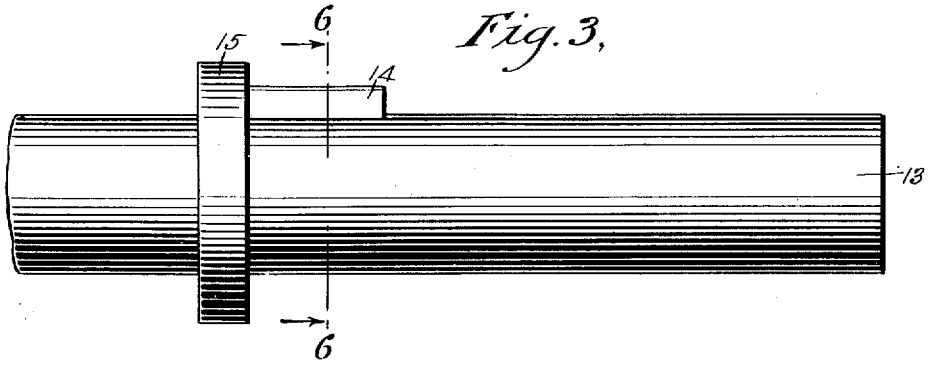



*Fig. 4,*

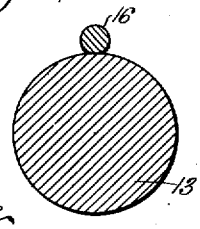



*Fig. 5,*

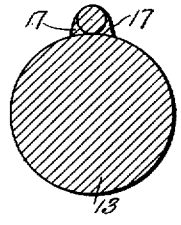
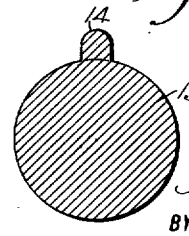



*Fig. 6.*




WITNESSES

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# UNITED STATES PATENT OFFICE.

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## AXLE RECONSTRUCTION.

1,340,032. Specification of Letters Patent. Patented May 11, 1920.

Application filed August 8, 1918. Serial No. 248,999.

*To all whom it may concern:*

Be it known that I, JAMES R. FLEMING, a citizen of the United States, and a resident of Scranton, in the county of Lackawanna and State of Pennsylvania, have invented a new and Improved Axle Reconstruction, of which the following is a full, clear, and exact description.

Among the principal objects which the present invention has in view are: to avoid waste of partially worn axles; to renew service conditions in journals for wheels and similar members; to avoid loss of time in repair on car construction; and to add to the construction without weakening the part added to.

### *Drawings.*

Figure 1 is a side view, partly in section, of a worn axle journal showing in broken lines the surface of metal deposited thereon in accordance with the present invention;

Fig. 2 is a section of the journal showing the same as having been turned down or trued after the metal has been deposited thereon;

Fig. 3 is a side view of a journal having mounted thereon a retaining spline, the spline having been constructed on the journal;

Figs. 4, 5 and 6 are cross sections taken as on the line 6—6 in Fig. 3, showing the progressive steps followed in forming the spline shown in Fig. 3.

### *Description.*

Heretofore car axles and particularly such as have been employed in mining cars have been subject to wear of the journals or parts on which the wheels have been mounted, owing to the side thrust to which the said wheels are subjected when moving about curved sections of the track. The strain imparted is usually effective on the journals at the points illustrated in Fig. 1, forming a hollow section 11 and tapered ends 12. Wherever these sections are worn, the wheel is permitted to wabble and endanger the adjacent construction of the car or truck.

The method employed in the past has been to discard the axle thus worn. The service to which these axles are assigned is not such as would warrant the reducing of the journals and the addition of bushings in accordance with the usual shop practice for repairing worn shafting. The loss incident to the discarding of axles is great, and to save this loss is the main purpose of the present invention.

When employing the present invention, the worn axle is removed from the car and taken to the shop where it is treated by having a deposit of metal disposed thereon and welded thereto. The welding is performed preferably by the electric arc or electric torch. The metal for welding is usually supplied in the form of wire or drawn metal from the end of which liquid metal is flowed on to the journal 13 until the worn section is filled and the surface thereof is raised above the normal dimension of the journal shown by broken lines in Fig. 1. The excess metal thus deposited is subsequently turned down to the diameter of the journal as shown in Fig. 2. By thus turning the metal, an even and uniform surface is reëstablished for the journal 13.

While it is not essential, it is preferred that the wearing quality of the added metal shall be superior to the metal of the journal, thereby increasing in the repaired journal the resistance to wear in the zones where the wear has proved to be greatest.

In the axles where it is desired to avoid the rotation of the wheel on the axle, relying on the axle to turn in boxes, a key is provided for holding the wheel on the axle. Usually the key requires a keyway. This weakens the axle and renders the same liable to breakage. To lessen this defect, a series of pins are placed in the axle to serve as key members for which invention a patent was granted to me on March 18, 1913, No. 1,056,525. This form of construction has also proved defective in that the axle is weakened where the pins are inserted and breakage of the axle is liable at this point.

In accordance with the present invention, I build a spline 14 on the journal 13 and usually abutting the thrust collar 15 thereon. The method pursued in building this spline consists in laying a short section of wire or metal rod 16 on the journal of

Fig. 2 in the desired position. While the rod 16 is thus held, metal fillings 17 are deposited in the angles formed at each side of the rod 16, as shown best in Fig. 5. The deposits of metal fillings thus made are deposited by electric welding, using the wire or drawn metal as above described. The fillings 17 are deposited in excess of the metal required for the spline and are subsequently cut down to form the spline 14 having a cross section as shown in Fig. 6. The key member or spline thus formed is integral with the journal 13 and instead of subtracting, adds to the strength thereof.

*Claim.*

A method of reconstructing axles, consisting in adding a spline to an axle by welding supporting metal between the body of said spline and the body of said axle; and then shaping the added metal to conform with the design of said spline.

JAMES R. FLEMING.