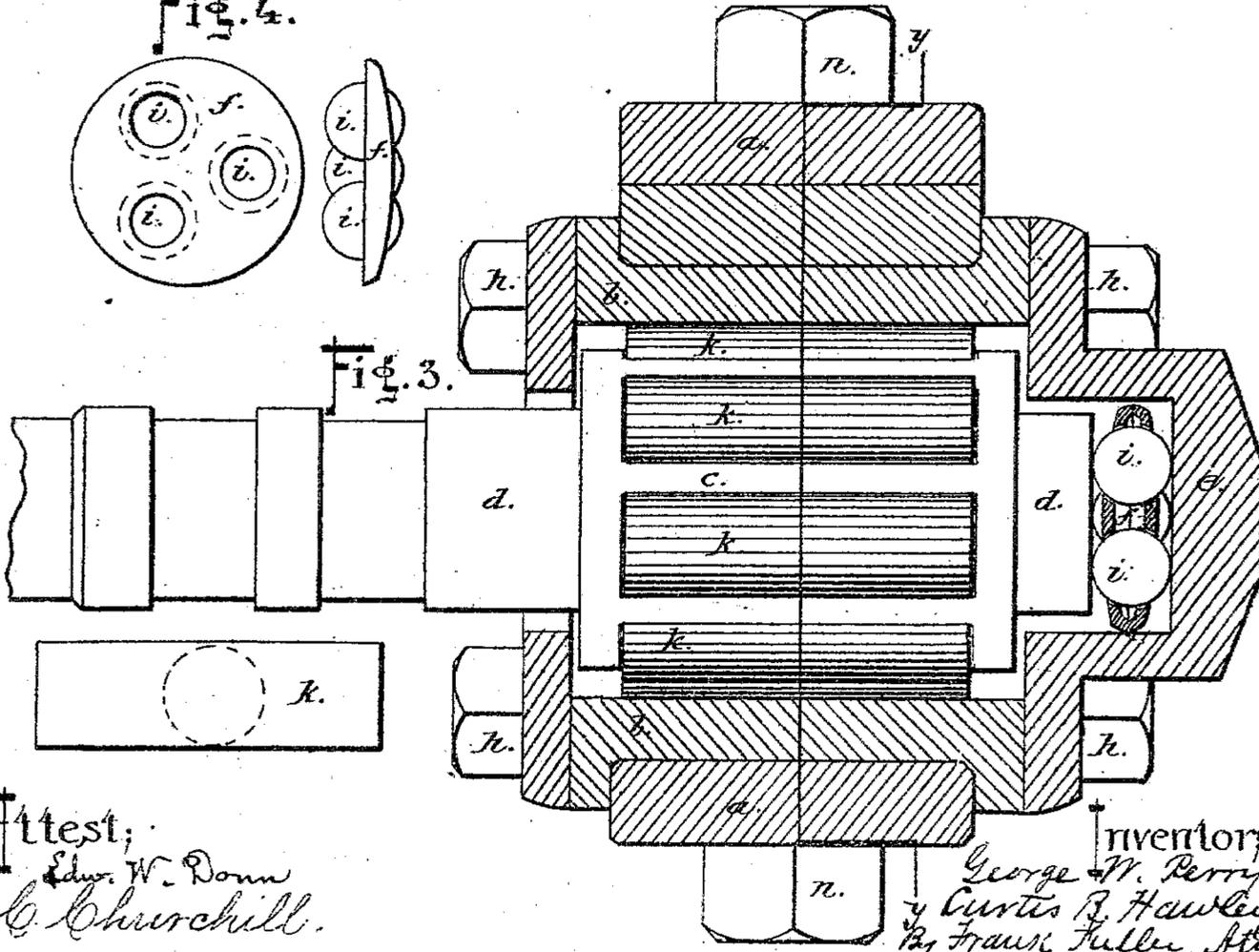
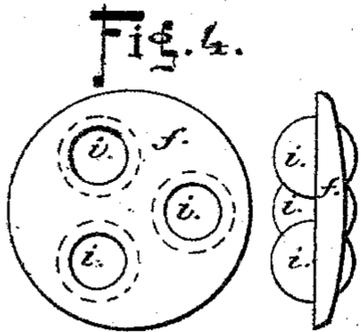
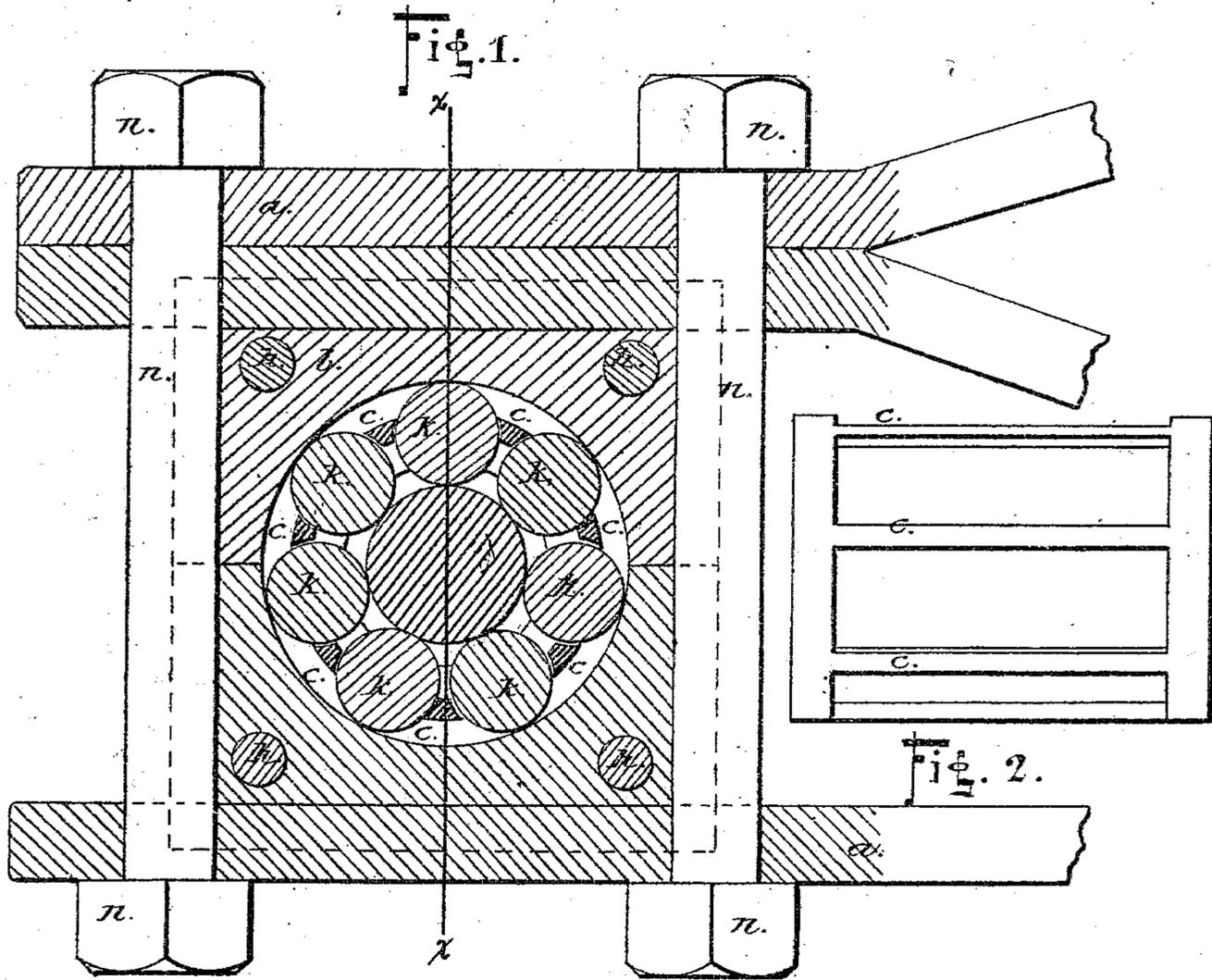


G. W. PERRY & C. B. HAWLEY.

Improvement in Car-Axles and Axle-Boxes.

No. 132,100.

Patented Oct. 8, 1872.



Attest;
 Edw. W. Donn
 J. C. Churchill.

Inventors;
 George W. Perry,
 & Curtis B. Hawley,
 By Frank Fuller, Atty.

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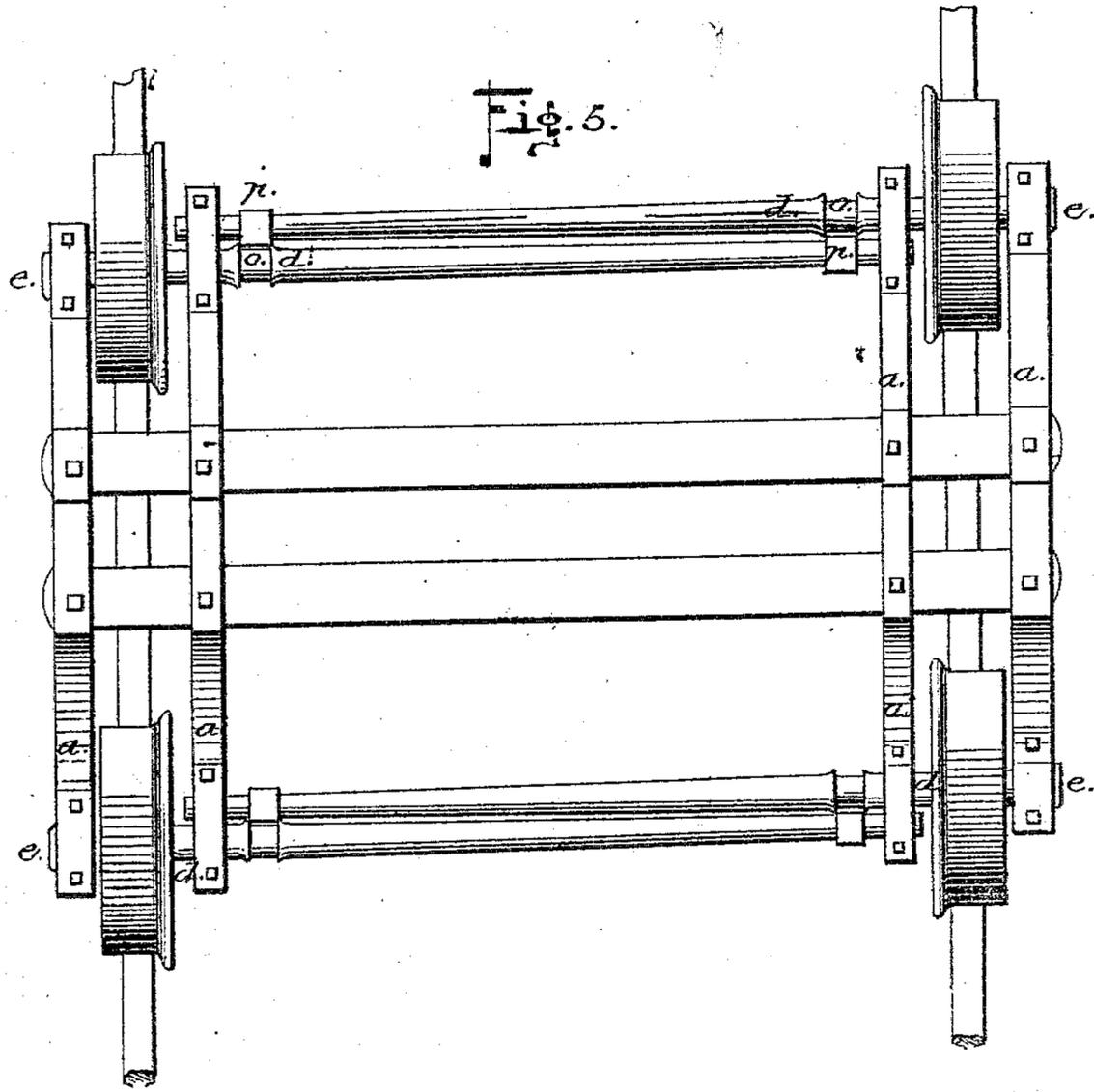
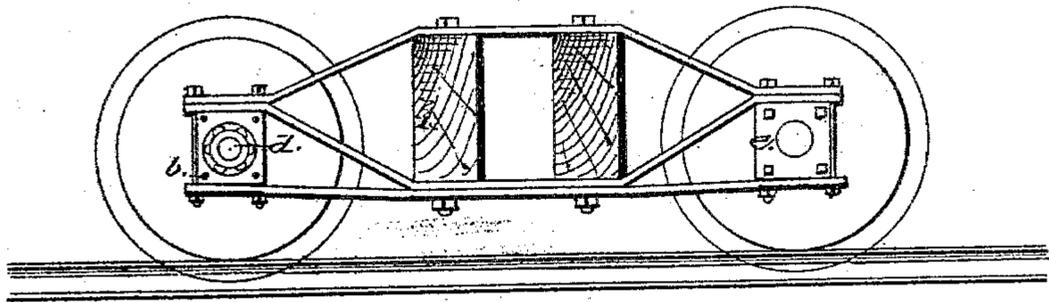


Fig. 6.



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UNITED STATES PATENT OFFICE.

GEORGE W. PERRY AND CURTIS B. HAWLEY, OF SALT LAKE CITY, UTAH,
ASSIGNORS OF FIFTY-TWO ONE-HUNDREDTHS THEIR RIGHT TO BRIG-
HAM YOUNG, HIRAM B. CLAWSON, FRANK FULLER, BRIGHAM YOUNG, JR.,
AND JOHN W. YOUNG, OF SAME PLACE.

IMPROVEMENT IN CAR-AXLES AND AXLE-BOXES.

Specification forming part of Letters Patent No. 132,100, dated October 8, 1872.

To all whom it may concern:

Be it known that we, GEORGE W. PERRY and CURTIS B. HAWLEY, of Salt Lake City, in the county of Salt Lake and Territory of Utah, have invented a new and useful Improvement in Car-Axles and Journal-Boxes; and we hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawing making part of this specification, in which—

Fig. I is a transverse section, showing an end view of the journal-box complete; Fig. II is the diaphragm or slotted cylinder; Fig. III is a longitudinal section of journal-box, showing the several parts in position; Fig. IV shows the concave plates and anti-friction balls in position; Fig. V is a top view of the divided axle with attachments; and Fig. VI is an end view of the car-truck and journal-boxes, showing the cover *e* removed and also in position.

The objects of our invention are twofold; first, by the use of our divided axle to lessen the strain or torsion to the car-truck in turning curves; and, secondly, to reduce the friction of the bearings.

To accomplish the first result we supply each pair of car-wheels with two axles, *d d*, as shown in Fig. V, which are hung in double braces *a a*. Each division of the axle passes through one wheel only, while the other extremity of each division rests in the interior brace. The axles lie parallel with each other, and in such close proximity that, in ordinary use, the collar *p* upon one axle bears lightly upon the seat of the depression *o*. The wheels thus revolve simultaneously. In turning curves, however, the slight play of the bearings permits a separation of the divisions of the axle and allows one wheel to turn independently of the other. The chief object of the collar and groove is to divide any severe side strain upon the braces *a a*.

To overcome the friction of the multiplied bearings we apply to each bearing a journal-box, constructed substantially as shown in Figs. I, II, and III, and attached to the braces *a a* by bolts *n n*.

In Fig. I *bb* is intended to show the journal-

box chambered to receive the diaphragm *c*, Fig. II, containing the rollers *K*; and *d* is the shaft or journal. The rollers *K* are constructed without journals and are placed loosely in the diaphragm *c*, which holds them in position around the periphery of the shaft, thus preserving a perfect and central bearing between the shaft and the box. The diaphragm or slotted cylinder *c* is placed in the chamber formed in the box *b*, but touches neither the shaft nor box, being wholly supported by the rollers *K*, as shown in Figs. I and III.

To overcome any end friction which may occur we provide an exterior cover for the box *b*, which cover we supply with anti-friction balls, as shown at *i i*, Figs. III and IV. These balls are contained between two concave plates, *f f*, which are held together by rivets. The balls are held in position by holes passing through the plates, from which holes the balls slightly project. The utmost freedom of motion is afforded the balls by countersinking the holes in the plates on their interior surfaces. The cap *e*, Fig. III, is firmly attached to box *b* by bolts *h h*.

While we find it impracticable to employ our system of divided axles without adding thereto our anti-friction devices to the numerous bearings which the divided axle demands, we are aware that our system of rollers and balls may be advantageously employed upon many descriptions of bearings other than such as are connected with railway trucks. We have applied them to lathe-journals, and other machinery revolving with great rapidity, and found a great reduction of friction, while the use of lubricating material was greatly dispensed with.

We construct the anti-friction rollers and balls of any hard metal, using fine steel in preference. The size of the rollers and balls depends upon the size of the shaft in contact with which they are to run.

By our system of divided axles we are enabled to reduce the size of each axle about one-fourth at the bearings, and fully one-half at the interior extremity. The size of the

rollers as well as their number is determined by the support which the shaft may demand. The shaft should be so supported at all points as to avoid unnecessary play, and to secure for it a perfectly central position in the box. We have found rollers three-fourths of an inch in diameter and placed as near together as possible, without touching at the sides, to work well in practice, when confined in our diaphragm and employed upon the journal of a three-inch shaft.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination, in a car-truck, of the axles *d*, having collars *p*, and recesses *o*, each

axle having a bearing each side of the wheel, and all constructed and arranged substantially as and for the purposes set forth.

2. The combination, in a journal-box, of the diaphragm *e*, rollers *k*, plates *f*, and balls *i*, the rollers projecting through the diaphragm and supporting it, and the balls projecting through the plates, the rollers and balls touching the journal when in position.

GEORGE W. PERRY.
CURTIS B. HAWLEY.

Witnesses:

G. H. SNELL,
A. W. CARLSON.