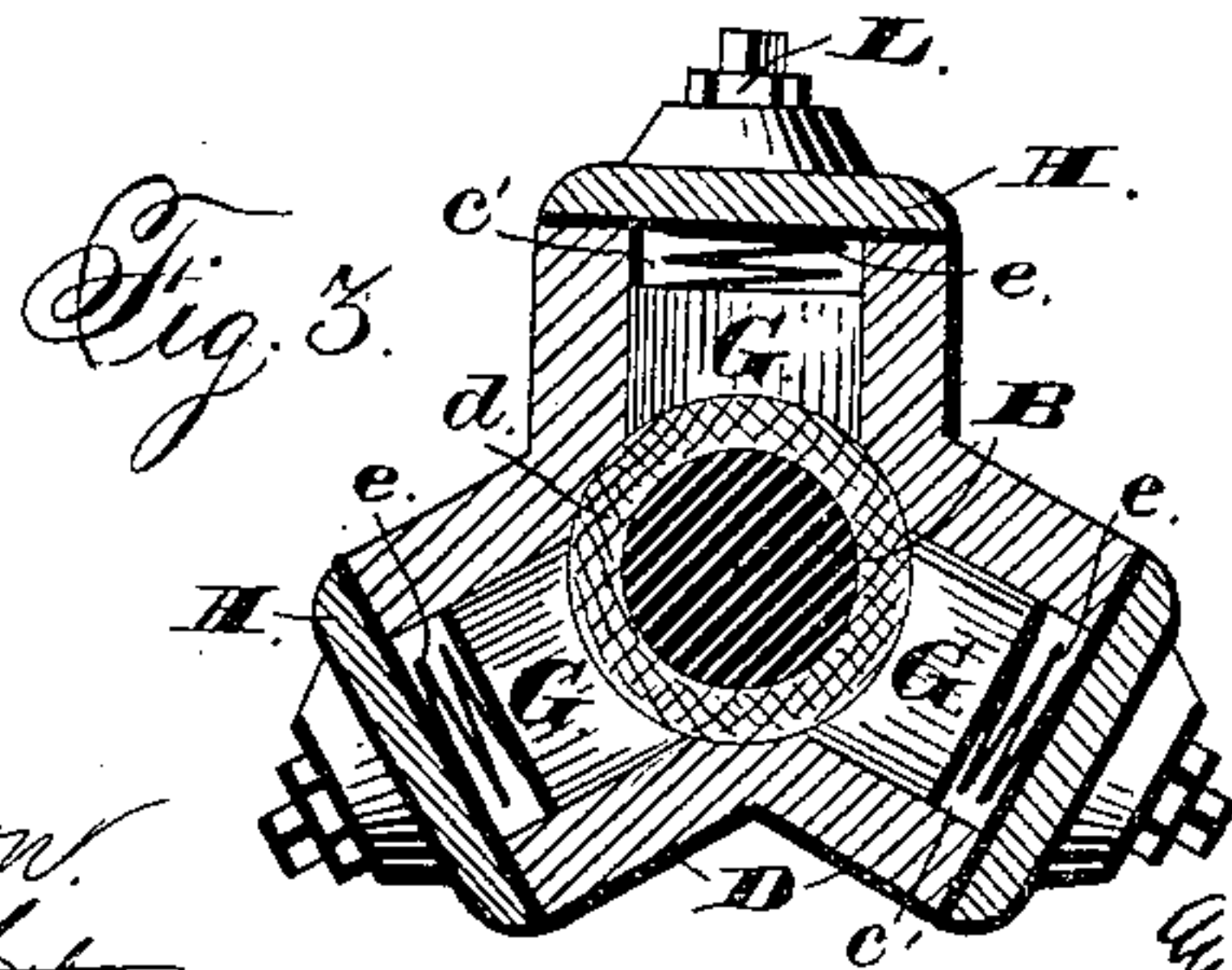


2 Sheets—Sheet 1.

## DIVIDED CAR AXLE.

Patented Nov. 3, 1885.

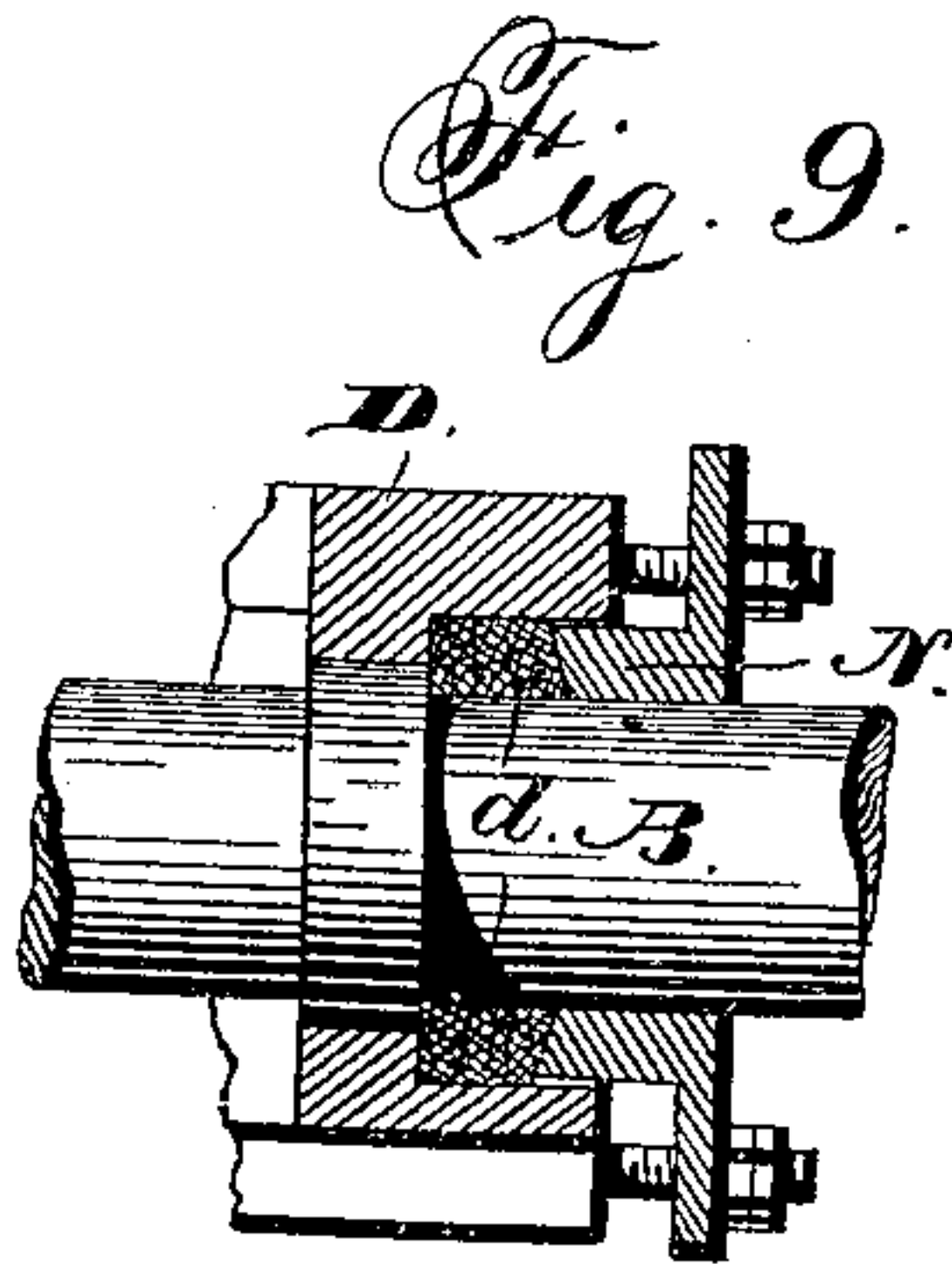
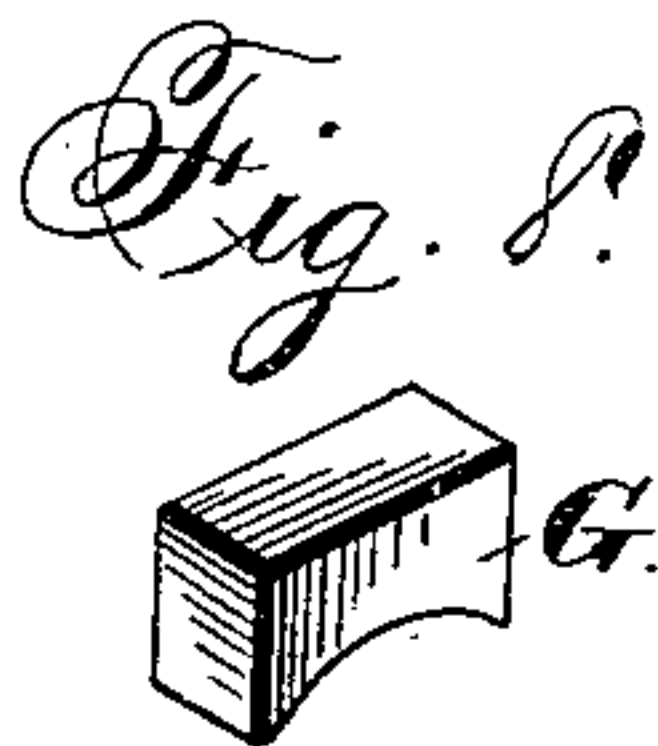
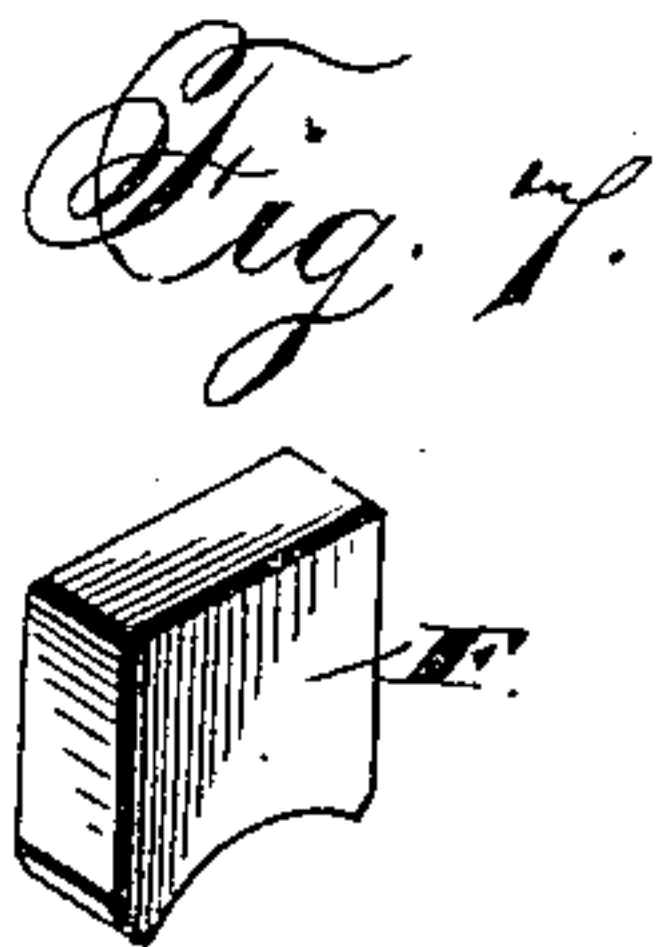
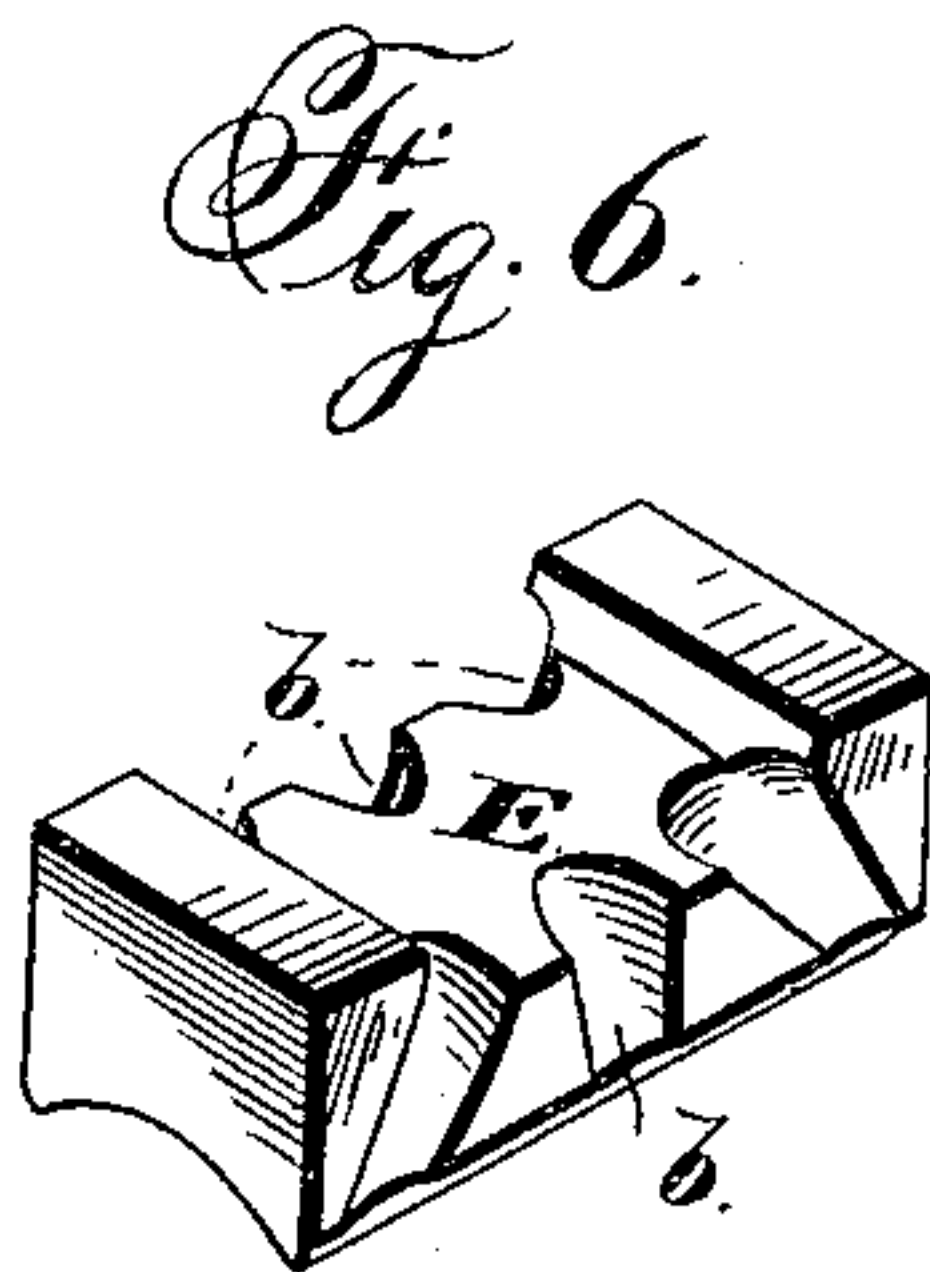
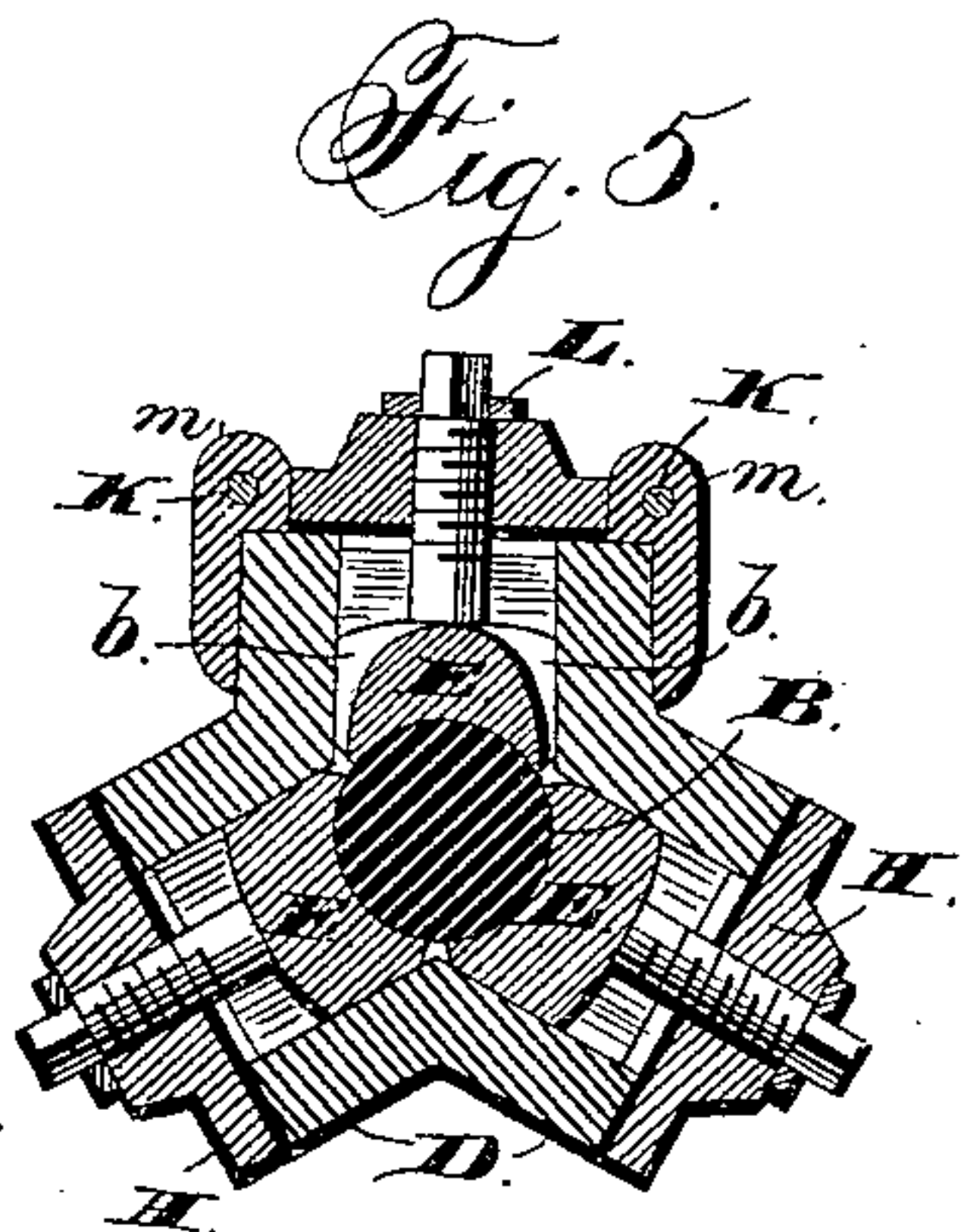
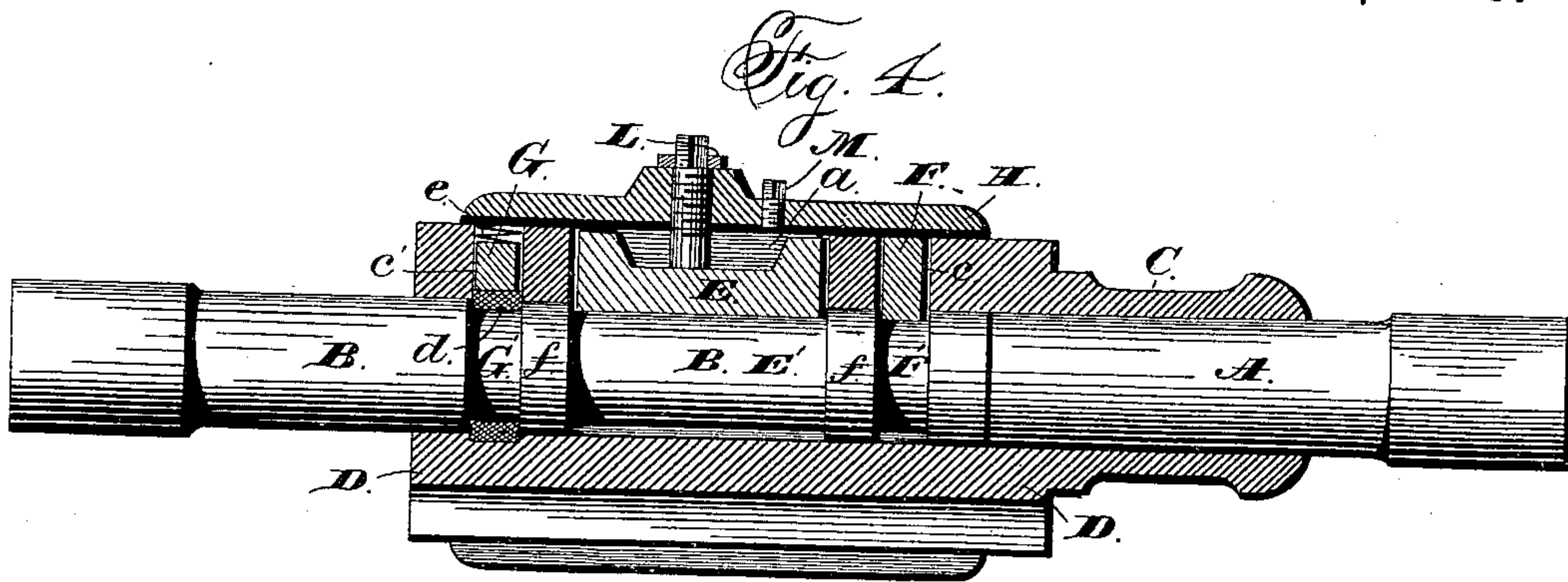


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2 Sheets—Sheet 2.

## DIVIDED CAR AXLE.

Patented Nov. 3, 1885.



Witnesses:

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# UNITED STATES PATENT OFFICE.

HANS THIELSEN AND HENRY W. DILG, OF PORTLAND, OREGON.

## DIVIDED CAR-AXLE.

SPECIFICATION forming part of Letters Patent No. 329,604, dated November 3, 1885.

Application filed April 30, 1885. Serial No. 163,935. (No model.)

*To all whom it may concern:*

Be it known that we, HANS THIELSEN and HENRY W. DILG, citizens of the United States, residing at Portland, in the county of Multnomah and State of Oregon, have invented certain new and useful Improvements in Divided Car-Axles; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of our invention is to provide a simple and effective means of connecting the parts of a divided car-axle in such a manner as to facilitate access for lubricating or replacement of parts, and so that the bearings and packing of the loose axle-section in the connecting-shell can be readily adjusted to diminish or prevent undue wear of the same, as hereinafter set forth.

In the annexed drawings, illustrating the invention, Figure 1 is a perspective view of our improved divided axle. Fig. 2 is a plan view. Fig. 3 is a cross-section through the packing devices. Fig. 4 is a longitudinal section. Fig. 5 is a cross-section through the brasses. Fig. 6 is a perspective view of one of the brasses. Fig. 7 is a perspective view of one of the keys. Fig. 8 is a perspective view of one of the packing blocks or glands; and Fig. 9 represents a modified manner of packing by means of a cylindrical flanged gland inserted in the end of the box portion of the connecting-shell.

Like letters of reference are used to indicate like parts in the several views.

A and B designate, respectively, what we shall term the "fixed" and "loose" portions or sections of a divided car-axle, each part of which in practice will be arranged to rotate in a suitable journal-box and have secured to it one of the car-wheels in the usual manner. To the inner end of the fixed axle-section A is firmly secured the tubular hub or shank portion C of a coupling box or shell, D, by which the loose axle-section B is received. The body of the shell or box D is three-sided, as shown in Figs. 3 and 5, and together with its hub or ring portion C may be cast of steel or other suitable metal. In each lateral wall of the coupling-box D is an oblong rectangular

opening, *a*, for the reception of one of the brasses E, that take the wear of the loose axle. These brasses may be made of any suitable material, and are each formed with a concave under surface corresponding with the circumference of the adjacent axle. On their upper surfaces and sides the brasses E are provided with grooves or depressions *b b*, that form, in conjunction with the contiguous walls of the shell or box D, a series of cups or receptacles for lubricating-oil. Beyond each end of the large oblong opening *a* is a smaller opening, *c* and *c'*, each of which extends across the box D. The opening *c*, which is nearest the fixed axle, is for the reception of a key, F, while the opening *c'*, at the other end of the box, receives a packing block or gland, G. The keys F and packing-blocks G are similarly formed, as shown in Figs. 7 and 8, the block G being of less depth, however, to afford room between it and the loose axle B for an elastic packing-ring, *d*, and also to provide space for a spring, *e*, between the top of the block G and the under side of a lid, H, that is attached to the wall of the box D on each side. The circumference of the loose axle B is preferably formed, as shown in Fig. 4—that is, with reduced portions F', E', and G'—for engagement with the keys F, brasses E, and packing-blocks G, respectively, an elastic packing-ring, *d*, being placed beneath the latter, as before remarked. The intervening collars, *f f*, thereby formed on the axle B, and which are of equal diameter therewith, thus serve as shoulders or bearings for the inner portions of the brasses and keys by which the parts of the axle are connected. The lower edges of the brasses E and keys F are beveled slightly, as shown in Figs. 5, 6, and 7, to afford spaces to prevent them from coming in contact with their fellows, and thus admit of adjustment inward upon the axle to compensate for wear of their concave surfaces. The arrangement of the brasses, keys, and packing-blocks in three sets within a three-sided box or shell fixed to one portion or half of a divided axle and adapted to engage the loose half of said axle, as described, combines the obvious advantages of great strength with lightness of structure and facility in the adjustment of the brasses against the loose axle-section in any required direction. The lids H may be se-



cured by means of screw-bolts *g* and nuts *h*; or they may be formed on each side with perforated lugs *k k*, that interlock with similar lugs, *m m*, on the box *D*, headed hinge-pins *K K* being passed through said lugs and secured by bow-pins *p p*, passing through perforations near their ends. That portion of each lid *H* which is immediately over the adjacent brass is thickened to furnish a suitable bearing for a screw-bolt and nut, *L*, by means of which the pressure of the several brasses can be regulated. A packing of india-rubber or other suitable material should be placed beneath the edges of the lids before they are secured. It will be observed that the lids *H* extend over the keys *F*, brasses *E*, and packing-blocks *G*, with their interposed springs, *e*, and thus hold said parts firmly in position, the elastic packing-ring *d*, beneath the blocks *G G G*, being forced in close contact with the loose axle, so as to exclude dirt and prevent the escape of oil. In each lid *H* is an aperture closed by a screw-plug, *M*, for introducing oil to the space above the brasses without removing or unfastening the lid. The lubricating-oil obtains access to the axle through the grooves *b b*, that extend down the sides of the brasses. It will be observed that the loose axle *B* meets the fixed axle *A* in the tubular portion *C* of the shell or coupling-box *D*, and that it has three bearings in the box portion of the shell besides its bearing in the tubular portion. The triangular form of the box *D* with the corresponding arrangement of inclosed brasses, keys, and packing-blocks, secures the greatest possible strength and admits of considerable diminution in weight, material and cost, as compared with some of the connecting devices heretofore in use. The peculiar shape of the box *D* furthermore permits a vertical force to be exerted upon the axle at three equidistant points, thereby improving the action of the brasses and keys. The brasses *E* not only serve as part of the connections for coupling the two halves of the axle and maintaining the gage or distance between the wheels without variation, but are also adjustably arranged so as to receive the greater part of the wear that would otherwise come directly on the body of the shell. As the brasses may be replaced when worn, and are adjustable to a more or less close contact with the loose part of the axle, they thus serve to lessen the wear of the shell, and thereby preserve its integrity for a long period. The keys *F* are an additional means of strength and afford further bearing-surfaces for the axle. The manner of securing these brasses and keys by means of the removable lids greatly facilitates their adjustment and enables them to be readily and quickly removed and replaced, whenever required. The construction of the lids is also such that the brasses can be adjusted to any desired pressure, and the introduction of lubricating-oil effected without detaching said lids. By packing the loose axle within the box *D* by means

of packing-blocks *G*, set in recesses *c'* with their lower ends resting on an elastic packing-ring, *d*, and having springs *e* above, between said blocks *G* and the lid *H*, we provide a very simple way of rendering the box dust-proof, and preventing the escape of oil. This construction also enables the pressure of the packing-ring *d* to be made greater or less by using springs *e e* of a greater or less tension. Instead of arranging the packing in this manner, however, the recesses *c' c' c'*, blocks *G G G*, and springs *e e e* may be dispensed with, the packing-ring in that case being introduced into an annular recess at the end of the shell and surrounding the loose axle, where it is secured by a flanged gland, *N*, secured by screw bolts and nuts, as shown in Fig. 9: By this latter method of packing, the loose axle *B* may be made without the reduced portion *G'*, and may be diminished in diameter only at those portions required to come in engagement with the brasses *E* and keys *F*. If desired, both methods of packing might be used together.

The advantages of our devices for connecting the parts of a divided car-axle will be clearly apparent in the facility with which the several parts can be disconnected, replaced, and adjusted.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In combination with the axle-sections *A B*, a coupling-box, *D*, triangular in cross-section and fixed to one of said axle-sections, and the brasses *E* and keys *F*, in three sets, removably secured within said box in engagement with the loose axle-section, substantially as described.

2. In combination with the fixed axle-section *A* and the loose axle-section *B*, having collars *f f* and reduced portions *F' E' G'*, the three-sided coupling-box *D*, secured to the fixed axle-section and provided with recesses *a c c'*, the keys *F*, brasses *E*, and packing-blocks *G*, placed in said recesses, the packing-ring *d*, springs *e e*, and removable lids *H*, substantially as described.

3. The combination, in a divided axle, of the three-sided box *D*, having recesses *a c c'*, the removable keys *F*, brasses *E*, and packing-blocks *G*, and the detachable lids *H*, having screw-plugs *M* and adjustable screw-bolts *L*, substantially as described.

4. The combination, with the fixed axle-section *A* and loose axle-section *B*, having shoulders or collars and reduced portions, of a three-sided coupling-box, *D*, secured to the fixed axle-section, the keys *F*, brasses *E*, having oil grooves or depressions *b b*, and the removable lids *H*, provided with screw-plugs *M* and adjusting-bolts *L*, for regulating the pressure of the brasses against the loose axle, substantially as described.

5. In a divided car-axle, the combination, with a three-sided coupling-box, of three sets of brasses, *E E E*, formed with concaved lower



surfaces, provided with beveled edges, and having depressed upper surfaces provided with oil-grooves *bb*, substantially as described.

5 6. In a divided car-axle, the combination, with the loose axle-section B and coupling-box D, having recesses *c'*, of the packing-ring *d*, packing-blocks G, springs *e*, and lids H, substantially as described.

Intestimony whereof we affix our signatures in presence of two witnesses.

HANS THIELSEN.  
HENRY W. DILG.

Witnesses:

J. SILVESTONE,  
W. T. HUME.