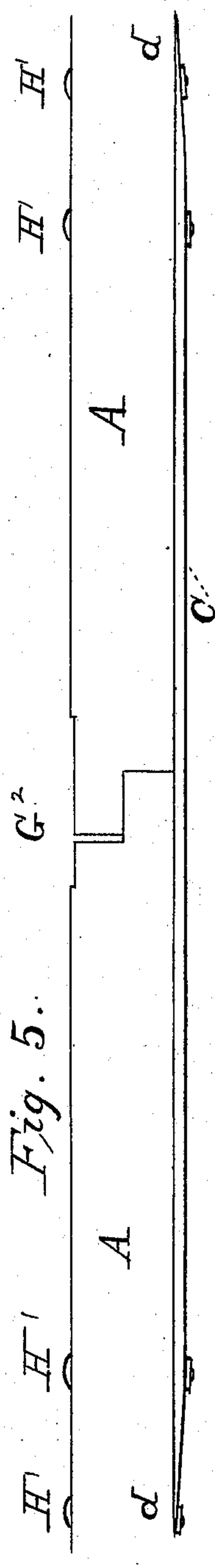
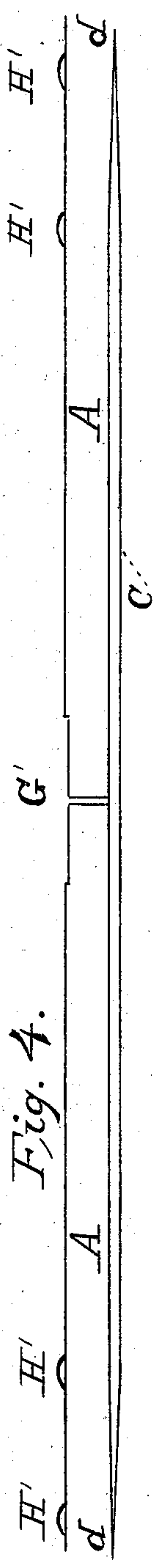
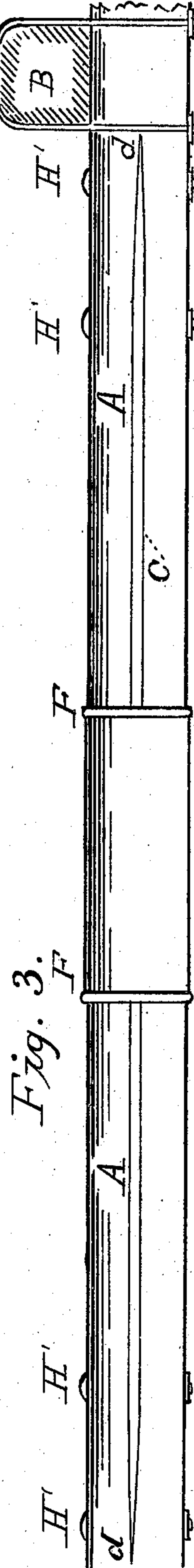
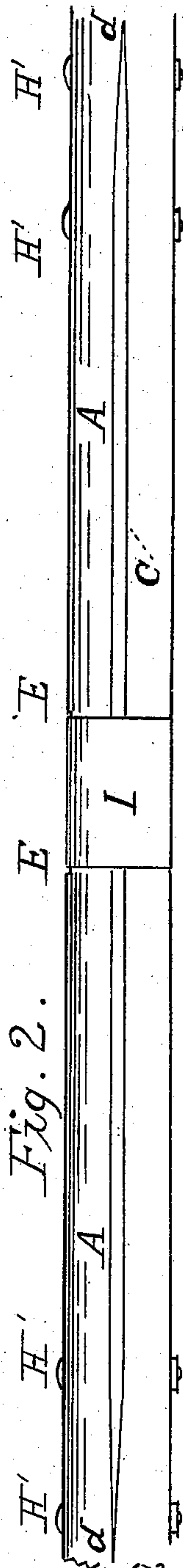
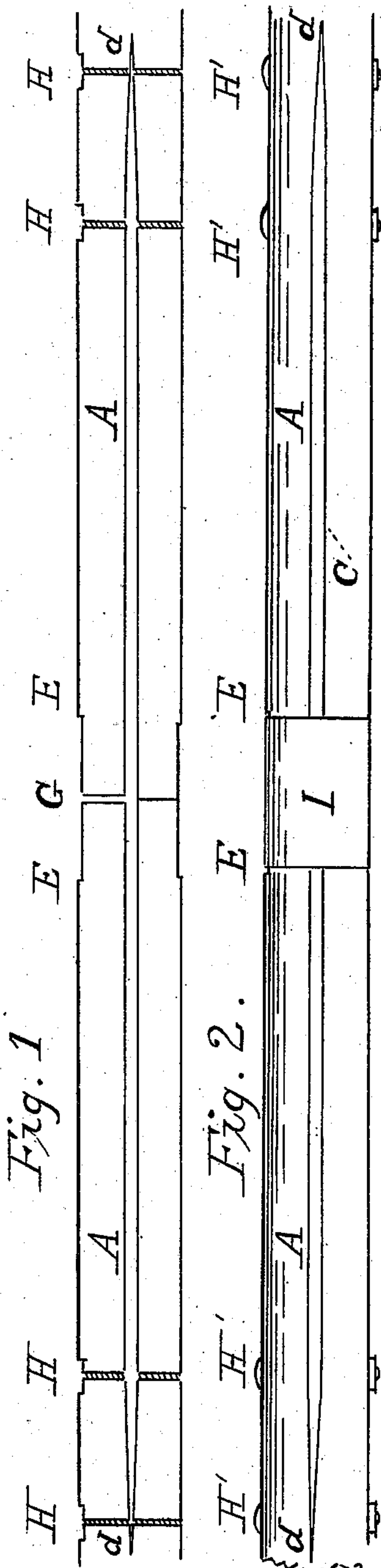


No. 867,992.

PATENTED OCT. 15, 1907.

J. A. MONTGOMERY.
POLE AND SHAFT FOR ROAD VEHICLES.
APPLICATION FILED NOV. 29, 1904.



Witnesses.
W. R. North.
W. F. White

Inventor.
John A. Montgomery
By H. S. Williams Attorney

UNITED STATES PATENT OFFICE.

JOHN A. MONTGOMERY, OF WALTON, NEW YORK.

POLE AND SHAFT FOR ROAD-VEHICLES.

No. 867,992.

Specification of Letters Patent.

Patented Oct. 15, 1907.

Application filed November 29, 1904. Serial No. 234,800½.

To all whom it may concern:

Be it known that I, JOHN A. MONTGOMERY, a citizen of the United States, residing at Walton, in the county of Delaware, State of New York, have invented an Improvement on the Thills, Shafts, and Poles of Road-Vehicles.

The invention, when applied as hereinafter described, to the thills, shafts and poles of road vehicles, makes them flexible to a limited extent, vertically, while remaining rigid horizontally, without impairing their strength, durability or appearance.

The object of making vertically flexible the thills and poles of road vehicles is to overcome the jerking motion communicated to the carriage and its occupants by the movement of the horse or team, especially tiresome and unpleasant in two-wheeled carts and carriages, making the greatest objection to their use.

A further important object is to lessen the irritation, chafing and injury to the horse or team inseparable from the use of rigid thills and poles.

The invention and its application is shown in the accompanying drawing representing a three foot section of the left thill forward of cross bar, reduced in drawing to one foot.

In accompanying drawings, Figure 1 is a side view of a section or longitudinal portion of a thill, shaft, or pole for a vehicle, divided transversely of its length. Fig. 2 is a side view of thill, shaft, or pole, with the two alined longitudinal sections connected according to my invention. Fig. 3 is a side view showing a leather trimming applied to cover the joint between the alined sections, a cross bar being shown in transverse section. Fig. 4 is a side view showing a modification, to wit: a thill, shaft, or pole one half of which is divided transversely instead of the whole. Fig. 5 is another modification, a metal spring being shown applied to the underside of a thill, shaft, or pole, in place of being placed in the longitudinal center of the same as shown in Figs. 1 to 4, and the meeting ends of the divided sections.

A indicates a thill, shaft, or pole, and B a cross-bar such as may be applied thereto. In Figs. 1, 2, 3, the thill is divided transversely at G, and each of the longitudinal sections is slotted lengthwise up to the points *d*.

The meeting ends are girdled, or reduced in diameter, as indicated at E, E.

H indicates transverse countersunk bolt-holes, passing vertically through the thill.

C is a steel spring of same width and curve as thill, thinned wedge shape at ends and provided with two bolt holes near each end, leaving not less than two feet of the spring between inner bolt holes, with the bolt holes in spring corresponding with those in prepared thill when the spring is placed in position extending from "*d*" to "*d*" in transverse slot in thill.

I is a metal band three inches wide fitting and filling the bed E E around thill at section, firmly binding

together the section ends of thill and inclosed spring at the point of section of thill.

H' indicates a series of bolts passing downward through thill and inclosed spring secured by nuts beneath thill, retaining thill firmly in original position and allowing the desired easy vertical flexion by leaving about two feet of the spring between the inner bolts free.

A trimming or band of leather F is applied over the metal band I and the adjacent portions of the thill sections.

Fig. 4 shows the thill with spring bolted in central slot of thill with the kerf G' dividing the half of thill above cross bar only, the metal band and leather envelop not yet applied.

Fig. 5 shows the spring bolted to under side of thill the dividing kerf G² formed as hereafter described and the metal band and leather envelop not yet applied.

The drawing illustrates my claim for invention of a very simple arrangement and device, which allows limited vertical flexion, while retaining transverse rigidity, and in no degree lessens the strength, durability and appearance of vehicle thills, shafts and poles to which it is applied.

The device may be applied in the following different methods: The thill may be manufactured in upper and lower longitudinal halves throughout its length and the spring placed in properly fitting space made for its reception, and the two halves inclosing the spring united in completed thill and bolted through thill and ends of spring as described. To secure required flexion the wood half of thill above spring only should be divided across down to longitudinal center of the spring, making a kerf about the width of an ordinary hand saw, as in Fig. 4, G'. Or if the thill is solid, if desired, the slot can be shaped without cutting the thill, the spring placed in position, the upper half of thill severed above center of spring, as in Fig. 4, G' and all secured with bolts as above. If the thill is large and rigid it is usually necessary to sever the thill both above and below the spring to secure proper flexion, as in Fig. 1.

In carrying out the preferred form of my invention, I proceed as follows: First, a strip of spring steel $\frac{1}{4}$ inch thick, about three feet long and of same width as thill, is forged and bent to conform to the exact contour of the thill and six inches at each end flattened wedge shape, making extreme ends quite thin. The thill is then divided about 18 inches in front of cross bar and a transverse slot, extending from severed end of each section 18 inches, and conforming exactly with and accurately fitting the prepared spring, is made in each section. The spring is placed in prepared slot and section ends of thill pressed together, the thill held accurately in its original position and thill and spring retained rigidly, exactly as before its division, by two bolts, four or five inches apart at each end of spring,

placed in holes drilled to receive them through thill and spring, and secured by nuts beneath thill. A kerf made by hand saw is made to widen the point where the divided thill sections meet on upper side of spring only, as in Fig. 1 at "G," to insure sufficient flexion. A strip of flexible copper sheeting three inches wide is wound firmly around thill and inclosed spring twice and soldered at its free end, extending $1\frac{1}{2}$ inch on each section and exactly fitting and filling bed made to receive it by removing a girdle of wood corresponding in width and thickness to the inclosing metal band, shown in Fig. 2, "I." An envelop F of suitable trimming leather is now applied around thill extending some inches beyond edge of metal band, completing the mechanism, Fig. 3.

The device is applied to cart and carriage poles in same manner, using a wider spring, and in same way springs of any size and length as deemed necessary may be used, also a solid metal band may be used instead of the described copper sheeting.

The described simple mechanism, properly applied on the thills of two wheeled road carts and carriages, insures entire absence of their objectionable horse motion, retains their thills permanently in their original shape, and from personal experience with his own vehicles the inventor feels justified in saying that it is the last part of the vehicle to require repair or wear out.

If considered desirable not to make slot in thill to receive spring, the latter C can be applied by bolting the steel spring to the bottom of the thill forward of cross bar, Fig. 5, dividing the thill at center of spring, preferably by sawing thill one-half through from top to cen-

ter, and one-half from bottom to center, making under saw kerf one inch nearer cross bar than the upper kerf, and splitting asunder from kerf to kerf at center of thill, Fig. 5. The thill so divided retains its position better than if cut direct through. The dividing kerf between thill sections should be made wider than with spring at center of thill, owing to the longer radius from spring to top of thill, and should be $\frac{1}{4}$ to $\frac{1}{2}$ inch, a dowel pin retaining section ends of thill accurately in position should be inserted and the spring and thill firmly held together at section of thill and center of spring by the metal band and leather envelop as heretofore described. From experience the inventor considers placing the spring in center of thill as described, far more satisfactory.

Having described my invention and its application, what I claim as new and original and desire to secure and protect by Letters Patent, is:—

1. A thill, or equivalent, having a transverse division and a metal spring applied to the same and extended along the thill on each side of the division, and a band applied over the division and extended on each of the adjacent portions of the thill, as shown and described.

2. A thill, or equivalent, which is divided transversely, thus forming two alined sections, each section being slotted lengthwise, a metal spring arranged and secured in said slot, a metal band applied to the juxtaposed ends of the thill sections, and a trimming applied over the band, as shown and described.

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

JOHN A. MONTGOMERY.

In presence of—

HECTOR S. WILLIAMS,
MARY A. WILLIAMS.