J. C. STORM.
Sleigh-Knee.

No. 227,455. Patented May 11, 1880.

Fig 1.

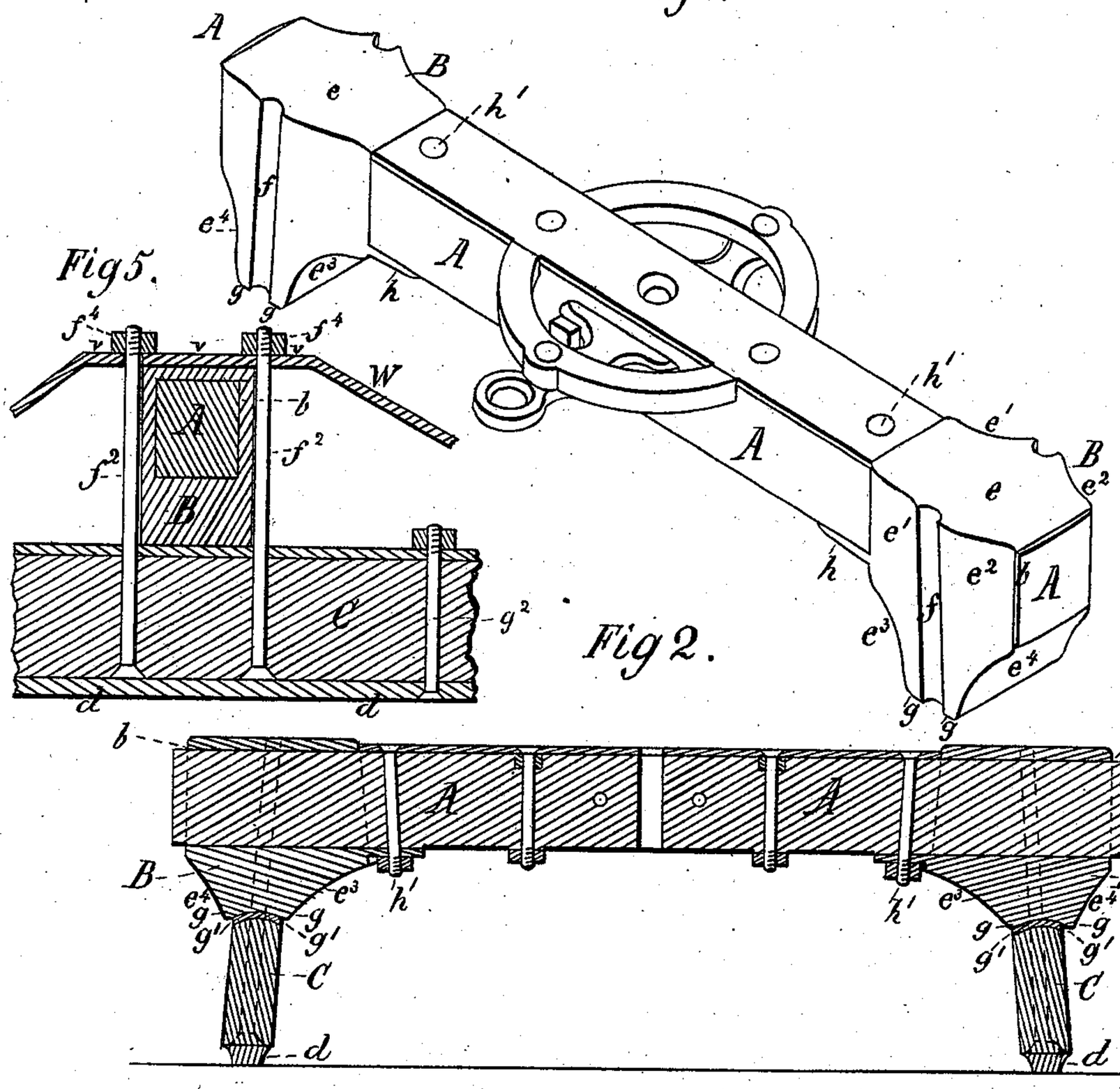


Fig 2.

Fig 5.

Fig 3.

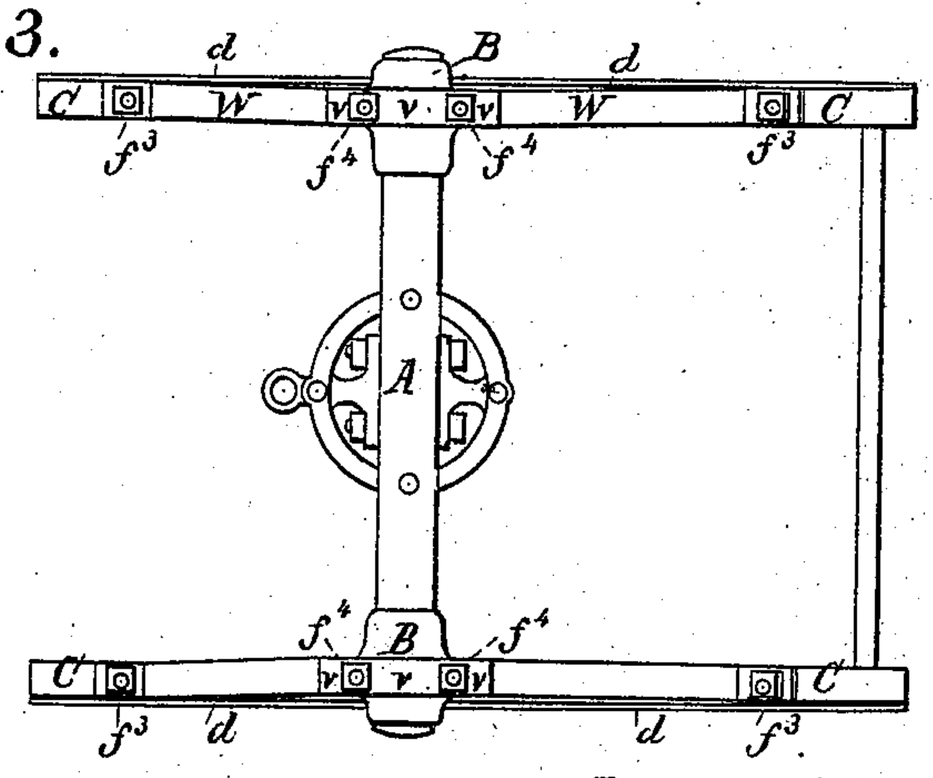
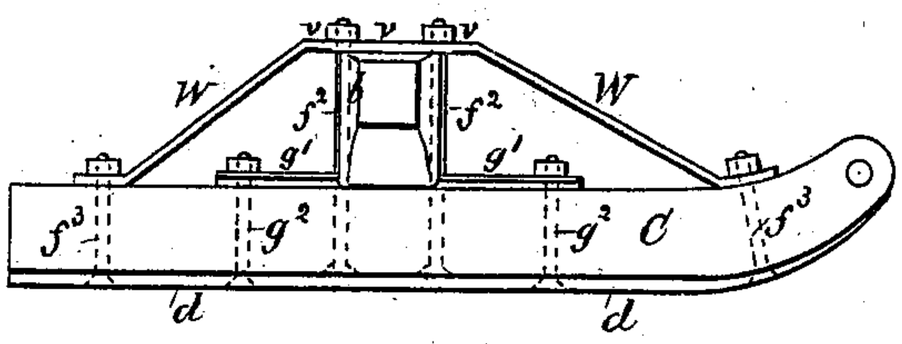


Fig 4.



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UNITED STATES PATENT OFFICE.

JOHN C. STORM, OF MENOMONEE, WISCONSIN.

SLEIGH-KNEE.

SPECIFICATION forming part of Letters Patent No. 227,455, dated May 11, 1880.

Application filed November 13, 1879.

To all whom it may concern:

Be it known that I, JOHN C. STORM, of Menomonee, Dunn county, State of Wisconsin, have invented a new and Improved Sleigh-Knee and Mode of Applying the Same to the Runner and Beam of a Sleigh; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings and letters of reference marked thereon, forming a part of this my specification of said invention, in which drawings—

Figure 1 is a perspective view of a sleigh-beam and knee as improved by me. Fig. 2 is a central longitudinal section of the same. Fig. 3 is a plan view of a "bob-sleigh" with my invention applied thereto. Fig. 4 is a side view of Fig. 3. Fig. 5 is a transverse section of the beam and knee, showing the runner and stay-brace in longitudinal section.

The nature of my invention consists in a one-piece metal sleigh-knee for receiving, binding, and holding in place the beam of a sleigh, as hereinafter described.

My improved knee is particularly adapted to that class of vehicles which are constructed with two short sleighs or two bob-sleighs connected together, one in advance of the other, and upon which a single box-body is placed, since, owing to the shortness of the runners and in view of economy as to weight, as well as cost of construction, it is desirable to only have a single beam in such vehicles, provided the runners can be firmly held in position together by a single beam; and these objects are attained by the use of my invention.

In the drawings, A indicates a sleigh-beam with my improved knee B applied to the ends thereof, as shown. C C indicate the wooden runners, and *d* the metal shoes applied thereto. The knee B may be made of either cast or wrought metal, but preferably of cast metal, since when so made the cost is but trifling, and even less than the cost of constructing and fitting the wooden knees in ordinary use. It is plane-surfaced at *e*, and on either side, at a point about midway of its length, is cut away or reduced, as at e' and e^2, thus leaving a central portion of greater width, in which semicircular boltways *f* are formed to receive and retain in position round bolts f^2, as shown in the figures. These boltways *f* are made in an oblique direction, as signified in Fig. 1, in order that the bolts f^2 may be properly applied in line with the oblique set of the runners C, as represented by dotted lines in Fig. 2, the runners being thus set in order to more effectively resist casual shocks It is also reduced, as at e^3 and e^4, thus forming a lower contracted end bearing, *g*. This end bearing, *g*, is made concave, as shown, in order to properly seat the knee upon a convex metal bearing-bar, g', which is bolted to the runner C by bolts g^2, which pass through the metal shoe *d*, as indicated in Figs. 4 and 5. The knee is also constructed with a rectangular horizontal opening, *b*, through it, as indicated in Figs. 2 and 5, in order to properly receive the end of the beam A, as shown, and is also provided with a broad bearing portion, *h*, of nearly the width of the beam, so that by the use of a bolt and nut, as at h', the knee may be held firmly in place on the beam. That portion of the knee which occupies a position beneath the beam is made solid, and thus the concave end *g* has a full bearing upon the convex metal plate g', and when in position, as shown in Fig. 2, the concavity of the end *g* serves, in connection with the bolts f^2, to act as side abutments against side shocks upon the runner C, as well as a proper seat, from which the runner cannot be easily displaced. As shown in Fig. 5, the beam A and knee B are secured to the runner C by bolts f^2. These bolts are made round and fit in holes bored through the runner, the heads of the bolts being countersunk in the runner, as shown. The bolts f^2 take into the boltways *f* of the knee B, and at their upper ends are screw-threaded and provided with nuts f^4, which screw down upon a metal longitudinal stay-brace, W, which extends from the front to the rear end of the runner C. The stay-brace W is a strong flat metal bar, confined to the runner C by bolts, as at f^3, and is so formed as to have a portion of its length *v v v* seated upon the plane surface *e* of the knee B when the beam and knee are fixedly in position, as represented in Fig. 4.

Ordinarily a sleigh-knee is applied to a sleigh-runner by cutting a tenon on the lower end of the knee, and of a length equal to the full width of the lower end of the knee and of

a thickness equal to one-third of the thickness of the runner. In other words, the mortise cut in a sleigh-runner is ordinarily of a length equal to the width of the knee at its lower end and of a width equal to one-third of the thickness of the sleigh-runner, and thus the mortise in the runner and the tenon on the knee are made to fit each other.

The result of cutting these mortises is, that the sleigh-runner is comparatively weak at its mortised portions, and often breaks at these points. This difficulty my invention overcomes, thus enabling me to utilize sleigh-runners which are much lighter, while at the same time they are much stronger, and the cost of construction greatly reduced.

I claim—

As a new article of manufacture, the one-piece metal sleigh-knee B, provided with a horizontal internal passage, *b*, to receive the end of a sleigh-beam, A, the walls of which passage surround and bind the four sides of that portion of the beam which enters said passage, substantially as described.

JOHN C. STORM.

In presence of—
OLE A. LOKEN,
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