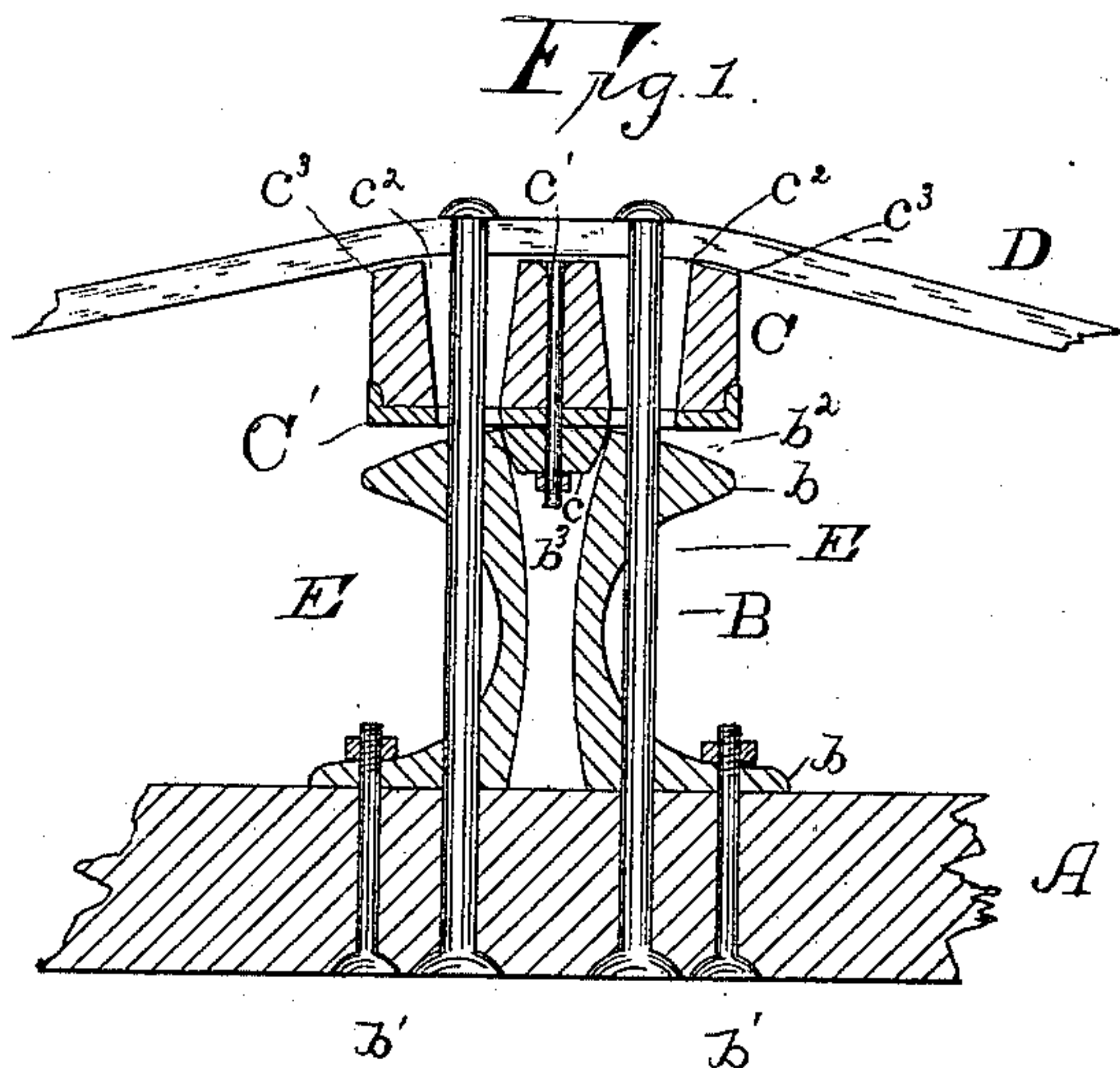
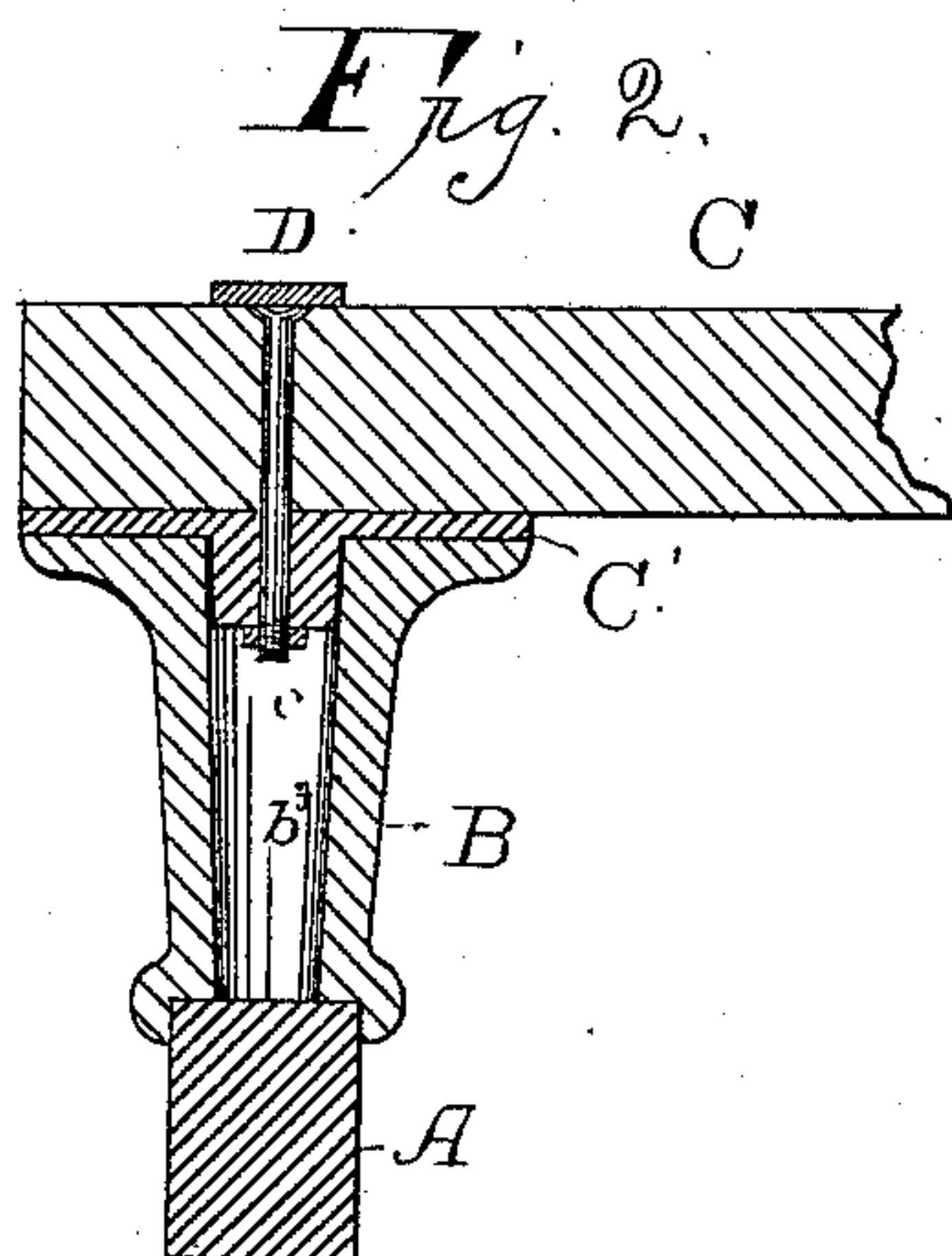


(No Model.)

C. E. BELKNAP.
SLEIGH KNEE.

No. 308,591.

Patented Dec. 2, 1884.



Witnesses:
Thomas F. Holden.
W. Chapman

Inventor.
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per Hancock & Hancock
Atty.

UNITED STATES PATENT OFFICE.

CHARLES E. BELKNAP, OF GRAND RAPIDS, MICHIGAN.

SLEIGH-KNEE.

SPECIFICATION forming part of Letters Patent No. 308,591, dated December 2, 1884.

Application filed March 22, 1884. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. BELKNAP, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Sleigh-Knees; and I 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.

My invention relates to that class of sleigh-knees which are provided with means for allowing the runner to adapt itself to the inequalities of the surfaces over which it is moved without bringing an unnecessary strain upon the parts.

The objects and nature of my invention will more fully appear from the subjoined description and drawings, and specifically pointed out in the claims.

Referring to the drawings, Figure 1 is a section parallel with the runner, and Fig. 2 a section at right angles to that shown in Fig. 1.

A represents the runner, B the knee, C the beam, and D the rave.

The knee B is provided with flanges b , provided with holes, through which bolts b' pass for the purpose of attaching the knee to the runner, which is provided with counter-sinks for the heads of the bolts. The upper side, b^2 , of the knee is rounded, so that the beam C will have a surface to rock upon, and provided with a recess or opening, b^3 , for the projection c on the under side of said beam. The walls of recess b^3 are preferably curved inwardly and downwardly to form a seat for the projection c , the front and rear surfaces of which are correspondingly curved. The under side of the beam is provided with a metallic plate, C' , to which projection c is attached by means of bolt c' , or is formed integral with the plate, and the whole attached to the beam by means of said bolt c' , as shown. This plate protects the beam from wear when rocked upon the knee. The beam is provided with conical openings c^2 , having their base at the upper side. If plate C' be used, corresponding openings which register with the openings c^2 are formed therein. Over these openings the rave D passes, and is attached to the runner in the usual manner. The up-

per side of the beam is rounded at c^3 , where the rave, which is also rounded, passes over, so that the latter will not interfere when the beam is rocked.

To secure the runner, knee, beam, and rave together, bolts E E are used. These bolts pass vertically through the parts, but have no contact with beam C, as they pass through the conical openings c^2 .

The operation of this device is simple. When the runner A passes over an uneven surface, it rises and falls, and the beam rolls upon the rounded surface of the knee. The openings c^2 prevent the bolts E E from interfering with this movement, as their conical form gives sufficient play for the beam to roll. The advantages gained by this construction are great durability, an independent movement to each runner, and great rigidity against lateral strain, while having flexibility in its other movements.

What I claim is—

1. In a sleigh, the combination of a runner, a knee attached to the runner, and having a rounded upper surface provided with a recess, a beam adapted to roll upon said rounded surface, and having a projection which is inserted in said recess, and a rave for holding the beam in place, substantially as described.

2. In a sleigh, the combination of a runner, a knee having a rounded surface, a beam adapted to roll upon said rounded surface, and having vertical openings, a rave for holding the beam in place, and bolts attached to the runner and rave, and passing through said vertical openings, substantially as described.

3. In a sleigh, the combination of a runner, a knee having a rounded upper surface provided with a recess, a beam adapted to roll on said rounded surface, and having vertical openings, and a projection which is inserted in said recess, a rave for holding the beam in place, and bolts attached to the runner and rave, and passing through the vertical openings, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES E. BELKNAP.

Witnesses:

HORACE TOMPKINS,
L. V. MOULTON.