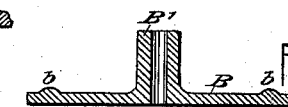
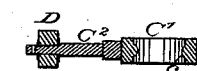
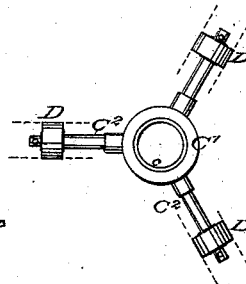
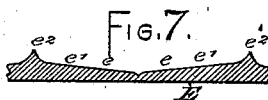
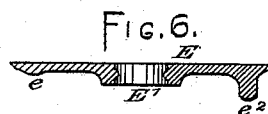
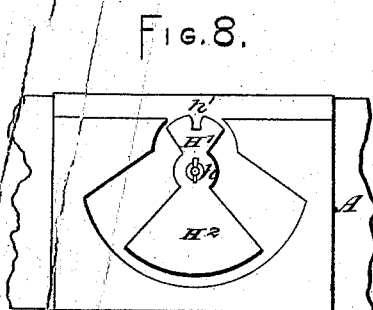
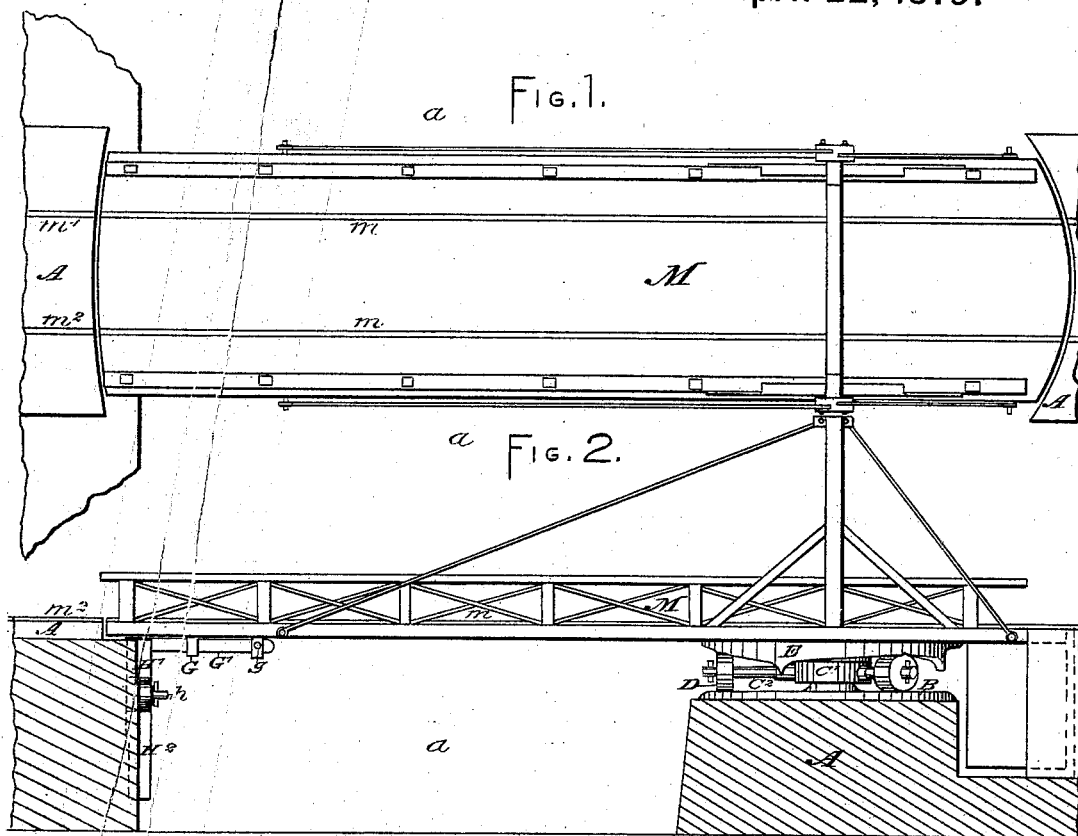


H. F. SNYDER.
Swing-Bridge.

No. 214,530.

Patented April 22, 1879.



WITNESSES:—

Chas. C. Stetson
E. B. Bolton

—INVENTOR:—

H. F. Snyder
by his attorney E. B. Bolton

UNITED STATES PATENT OFFICE.

HENRY F. SNYDER, OF WILLIAMSPORT, PENNSYLVANIA.

IMPROVEMENT IN SWING-BRIDGES.

Specification forming part of Letters Patent No. **211,530**, dated April 22, 1879; application filed December 16, 1878.

To all whom it may concern:

Be it known that I, HENRY F. SNYDER, of Williamsport, Lycoming county, in the State of Pennsylvania, have invented certain new and useful Improvements relating to Swing-Bridges, of which the following is a specification.

My invention is of the class more especially adapted for bridging across canals in cities where the large amount of traffic would render an elevated bridge inconvenient. Such bridges have been constructed to be opened by the force of the passing boats, and to be closed again by their own gravity, inclines being formed in a circular track, and wheels being provided to run thereon to allow of that mode of operation.

The structure is liable to warp and settle unequally. I mount the wheels on spider-arms which connect to a ring fitting so as to freely turn on a fixed central post, and I bevel the inner surfaces of the ring, so that the ring may be strained into a position considerably oblique to the central post, or the post may become inclined, while the ring remains level, without binding, while still retaining a close fit. The top casting is also similarly fitted. The chances of the central post becoming inclined or loosened are reduced by casting it in one with the bed-casting, and by making an upright hollow cylinder of considerable size, casting it in one with the bed. It is very reliable.

My invention allows the ways to be imperfectly shaped without involving any more serious difficulty than the shifting of the bearing outward or inward. The narrow line of the tread on the rounded surface avoids inconvenience from the tendency of the rollers to move in straight lines.

I provide a catch to let go under the considerable force brought to bear when the bridge is struck by a boat, but which will, under all ordinary circumstances, hold the closed bridge in an exact position. This is more particularly important when the bridge is crossed by a horse-railroad.

The following is a description of what I consider the best means of carrying out the invention:

Figure 1 is a plan view of my improved bridge. Fig. 2 is a side elevation. Fig. 3 is

a top view of the anti-friction rollers and attachments. Fig. 4 is a central section through the spider, showing one arm and roller. Fig. 5 is a central section through the bed-plate and post. Fig. 6 is a central section of the upper plate. Fig. 7 is a view showing the upper track reversed; and Fig. 8 is a front view of the pendulum or latch.

Similar letters of reference indicate like parts in all the figures.

A A are the abutments, and *a* a section of the canal. B is the bed-casting, formed with the stout hollow cylindrical post B' in the center, cast in one piece therewith, and with the circular track *b*, also cast in one piece therewith, and having its upper surface rounded in cross-section, as indicated in Fig. 5.

The spider-frame is formed with a ring, C¹, closely embracing the post B', with liberty to turn around, and also to assume any slightly-inclined position required, by reason of the interior of the ring C¹ being beveled both ways from a narrow bearing, *c*, at the mid-height, as indicated in Figs. 3 and 4. On the arms C² are mounted cylindrical bearing-rollers D of chilled iron.

E is the upper casting, having a hole, E', adapted to receive the large hollow post B'. It has a circular track, *e*, formed with a rounded bearing-surface cast in one therewith, as shown in Fig. 6. One or both of the tracks, *b* *e*, are inclined to give the required tendency to the closing motion, as will be understood. The summit of each incline *e*¹ is formed with a high stop, *e*², the two sides of which are curved to the same radius as the rollers. When the bridge is swung to its fullest extent the rollers bear fairly against the stops *e*², which arrests its motion.

I propose to employ in addition suitable spring-stops (not represented) in positions at proper distances from the center casting, to be struck by the body of the swinging bridge and aid the stops *e*² in arresting the motion.

The bridge M may be made in any approved manner. It is mounted strongly upon the upper casting, E. I have represented it as provided with rails *m* for a horse-car railroad, which, when the bridge is closed, should be in line with corresponding rails *m*¹ *m*² of the main track.

It is important to hold the bridge in exactly the right position when closed. I have devised a latch which engages very easily and holds the bridge strongly under all ordinary strains; but the piece into which it engages is a lever counterweighted, so that on the striking of a boat it can yield and allow the latch to disengage.

G' is the latch, (a stout lever,) turning on a center, *g*, on the under side of the bridge, and guided in a stout keeper, G, which is also carried on the bridge, near the working-point of the latch. The engaging piece is marked H¹ H², the part H² being much the heavier. It is mounted on a stout pivot, *h*, and is free to vibrate in a casing or housing provided. The notch *h'* in the part H¹ is adapted to receive the latch G'. It may be slightly beveled. The notch is not V-shaped sufficiently to allow the latch to lift itself out under any lateral force applied.

The swinging device H¹ H² is of such weight that it holds its place with sufficient force to resist all the tendencies of the bridge to move in consequence of wind or the irregular motion received from carriages and cars. When the bridge swings into the shut position, the latch G' strikes the rounded surfaces of the part H¹ and is lifted. On reaching the notch *h'* it instantly engages, and after one or two slight rocking motions of the device H¹ H² the whole comes to rest. The entire bridge remains thereafter a fixture under all ordinary forces. But the moment the bridge is, in the working of the canal, struck by a rapidly-moving boat, it acts so powerfully on the latch G' that the device H¹ H² is instantly tilted in the required position, the force of the boat overcoming the gravity of the heavy part H², and causing it to swing far enough in the required direction to liberate the latch. Thus conditioned the latch easily leaves the cavity *h'* and the bridge swings open.

Modifications may be made. I have represented the castings B and E as open-work. They may be made continuous. The spider-

frame may be all of cast-iron, but I prefer that the main portion of the arms be of wrought-iron. It is important that the center *h'* be very strongly supported; but provision may be made for giving it elasticity, and also for adjusting it to a considerable extent up and down and to the right and left, as may be required, to cause the latch G' to engage properly, and to hold the tracks *m m¹ m²* correctly in line.

Not only the spider-frame C¹ C², but also the upper casting, E, is liable to be twisted into a position more or less oblique to the center post, B'. I give its interior the same finish I have described for the interior of the spider-frame, and for the same purpose.

The cylindrical rollers D are cast in chills. The hardness thus acquired allows them to endure the slight rubbing action to which they are subjected in twisting around on the narrow bearing formed by my swelled-face tracks.

The invention may be used for other than canal-bridges, and perhaps in some other structures than bridges strictly so-called, as gates, turn-tables, &c. I use the term "bridge" to include such.

I claim as my invention—

1. In a self-closing bridge having circular tracks *b c* and bearing-rollers D, the spider-frame C¹ C², having a narrow inner bearing, *c*, in combination with a fixed central post adapted to both turn and tilt, as herein specified.

2. In a canal-bridge adapted to be opened by a blow from a passing boat, the fastening-latch G' and yielding catch H¹ H², adapted to automatically secure and release the bridge, substantially as herein set forth.

In testimony whereof I have hereunto set my hand this 13th day of December, 1878, in the presence of two subscribing witnesses.

HENRY F. SNYDER.

Witnesses:

H. D. HEISER,
J. W. HEYLMUN.