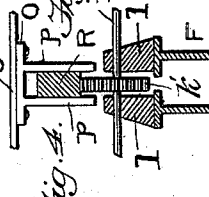
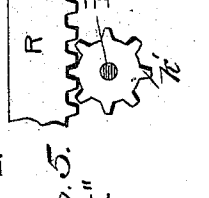
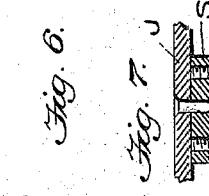
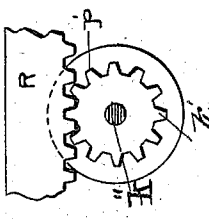
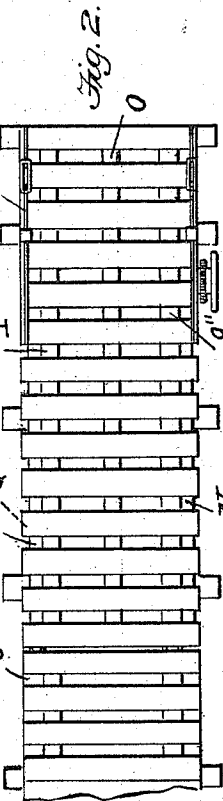
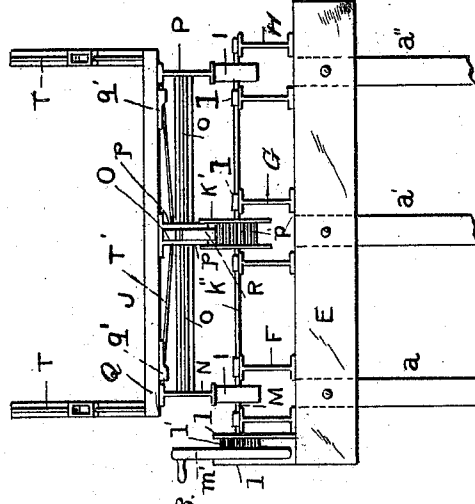
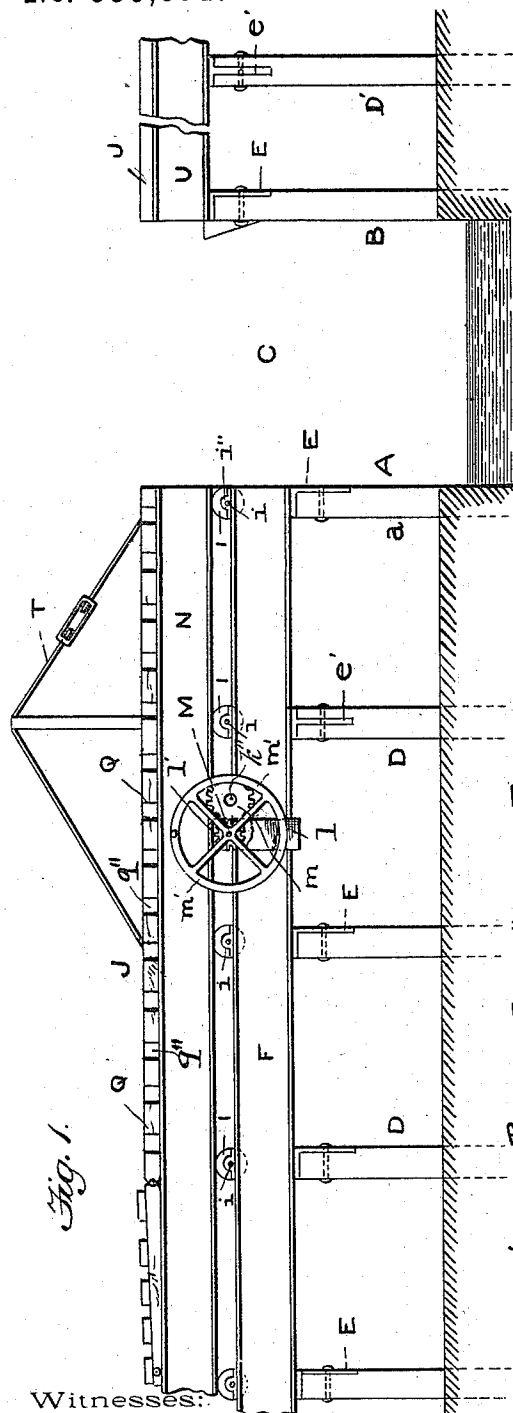


(No Model.)

N. C. JESSUP.
DRAWBRIDGE.

No. 535,831.

Patented Mar. 19, 1895.



Witnesses:

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UNITED STATES PATENT OFFICE.

NATHAN COOPER JESSUP, OF WESTHAMPTON, NEW YORK.

DRAWBRIDGE.

SPECIFICATION forming part of Letters Patent No. 535,831, dated March 19, 1895.

Application filed April 21, 1894. Serial No. 508,418. (No model.)

To all whom it may concern:

Be it known that I, NATHAN COOPER JESSUP, a citizen of the United States, residing at Westhampton, in the county of Suffolk and State of New York, have invented certain new and useful Improvements in Drawbridges; 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 draw bridges and is more particularly designed as an improvement upon the structure patented to me on the 13th day of February 1894, No. 514,754; and the objects that I have in view in the present instance are, first, to simplify the construction and make the parts more durable and efficient and, secondly, to so construct the flooring of the drawbridge as to avoid the use of fastening spikes or nails and enable any one or more of the planks to be taken away when worn and replaced by new planks.

In my former patent are shown and described masonry abutments on opposite sides of the draw, but in the present invention these abutments are dispensed with and I use two rows of transverse piles on opposite sides of the draw, and from these two front transverse rows of piles are provided other series of transverse piles forming the approaches to the draw. These transverse rows of piles are connected and braced at their upper ends by means of horizontal beams which are suitably fastened to the piles, and on these transverse beams on one side of the draw are supported longitudinal girders which are preferably arranged in three sets, which sets of girders are spaced apart at suitable distances from each other, each set of girders consisting of two parallel I-beams. At suitable intervals along the length of these two side sets of longitudinal girders are provided smooth faced supporting rollers which have their shafts journaled in suitable bearings upon the side girders, and between the I-beams of the middle set of longitudinal girders is arranged a driving gear which is carried by a shaft that extends to one side of the bridge and is geared to a suitable power shaft by which the driving gear may be rotated to move the bridge-platform endwise across the draw.

The bridge platform consists of three longitudinal beams and a series of planks of which two of the beams are single I-beams arranged at or near the sides of the platform and the third beam is arranged at the middle of the platform, said middle platform beam being provided with a rack with which engages the drive gear on the horizontal shaft, while the side beams of the platform are adapted to ride upon the smooth faced rollers supported between the two sets of side girders.

In practice, I may employ a straight drive gear supported to fit between flanges on the central beam of the platform or I may make this drive gear in the form of a double flanged drum with gear teeth between the flanges, and the rack on the central beam of the platform meshes with the teeth on the drive gear, whereby the platform is guided in its endwise movements and it is sustained by the smooth faced rollers on which ride the beams at the side of the platform.

The floor of the bridge-platform is composed of planks laid transversely across the longitudinal beams, and I have devised two means of fastening the planks to the beams, one of which consists in wooden strips interposed between the metallic beams and the planks, to which strips the planks are nailed, but to prevent rotting of the planks by water soaking in and around the nail holes, I prefer to lay the planks loosely upon the longitudinal platform-beams, said loose planks being held from endwise movement across the platform by means of two cleats which are fastened to the bottom side of each plank so as to be close to or bear against the two side beams of the platform and said loose planks being held against edgewise displacement by means of spacing blocks or strips interposed between the edges of the planks.

The invention further consists in the construction and combination of parts which will be hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a side elevation of my drawbridge. Fig. 2 is a top plan view of the platform, the supporting beams for the planks being omitted. Fig. 3 is an end elevation. Fig. 4 is an enlarged detail view of a modified construction of the drive gear and rack shown by Fig. 3. Fig. 5

is a side view of Fig. 4. Fig. 6 is a detail view of the flanged drive gear drum and rack shown by Fig. 3. Fig. 7 is a detail view of the means of fastening the planks to the beams of the platform.

Like letters of reference denote corresponding parts in all the figures of the drawings, referring to which—

A, B denote the two front series of transverse piles which are placed or driven on opposite sides of the draw C shown by Fig. 1, of the drawings, which piles are used in lieu of the abutments shown and described in my former patent. In rear of the piles A on each side of the draw C are driven other series of piles D, D', the piles D being in rear of the front piles A on one side of the draw and the piles D' being driven in rear of the front piles B on the other side of the draw. The piles A, B, and D, D', are preferably arranged in groups each of which groups has its piles disposed in transverse series across the line of movement of the platform of the drawbridge, and in Fig. 3 I have shown the front group of piles A on one side of the draw C as consisting of three piles *a*, *a'*, *a''*, which are fastened and braced together by the horizontal transverse beam E, it being understood that each group of piles B, D, D' are similarly arranged and connected by beams E in the manner shown by Fig. 3.

The horizontal transverse beam E to each group of piles may be of the half T form shown at *e* in Fig. 1 or of the T-form shown at *e'* in the same figure, but in either case the flanged horizontal beam E is spliced or set into recesses in the upper ends of the piles of the group which it braces, and is bolted to said piles to provide a rigid strong connection. On the beams E of the piles A, D, on one side of the draw C are laid the three sets of longitudinal girders shown at F, G, H, in Fig. 3, which girders are below the platform J and serve as the supports for the rollers by which the platform is supported, guided and operated. Two sets of these longitudinal girders F, H, are disposed near the ends of the beams E and near the sides of the platform J, and the third set of longitudinal girders G is arranged about midway between the side sets F, H, each set of girders consisting of two metallic beams of the I-form shown by Fig. 3, and which beams are bolted or otherwise suitably secured to the transverse beams E. On each set of side beams, F H, are arranged a series of smooth faced bearing rollers I, I', which are disposed at suitable intervals from each other along the length of the girders as shown by Fig. 1, and each smooth faced roller I, I' is arranged between the beams of the set of girders to which it relates and has its shaft, *l*, journaled in suitable bearings *l'* on the girders.

Between the girders G forming the middle set of girders of the structure is supported a series of flanged guide rollers (which are not herein shown but which are similar to the

flanged rollers shown and described in my prior patent hereinbefore referred to), and the roller *k'* at the end of the series of flanged rollers is rigid with an operating shaft *k''* that is journaled in bearings *l* on the girders, as shown by Figs. 3 and 4, said shaft *k''* extending to one side of the bridge platform J and provided with a spur gear wheel *m* which meshes with another gear wheel *l'* as shown by Fig. 1 on a shaft M that carries a fly wheel *m'* provided with a hand crank for conveniently turning the shaft *k''*.

The bridge platform J consists of three longitudinal beams N, O, P, and the planks or boards Q. The longitudinal beams N, O, P are arranged in a vertical plane between the girders of the sets F, G, H, see Fig. 3, and the two side platform beams N, P, each consists of single I-beams while the middle platform beam O is made with the parallel flanges *p*, between which is secured the rack R, the gear teeth of which project below the flanges *p* so as to engage with the teeth *p'* on the drive gear *k'*.

As shown in Figs. 3 and 6, which illustrate one construction of the means for moving the platform J, the drive gear is made of a double flanged drum with the gear teeth *p'* on its periphery between the flanges, and the lower edges of the flanges *p* on the central platform beam O fit between the flanges on the drum so as to be guided thereby against lateral or edgewise displacement. In the preferred embodiment of the drive gear shown by Figs. 4 and 5, I employ a straight gear spur wheel *k'* which meshes with the rack secured between the flanges *p* of the middle platform beam O, the gear wheel *k'* projecting up between the flanges *p* so as to guide the beam O, as shown by Fig. 4, the shaft *k''* of the drive gear being journaled in bearings *l*, *l'* which give the gear *k'* the necessary elevation to work between the flanges *p* of the central platform beam O.

The beams N, O, P, of the platform are rigidly connected together by means of cross braces *o*, *o*, which consist of straight metallic bars or they may be of angle bars, and the ends of the brace bars are rigidly bolted to the longitudinal platform beams, and these braces and beams form a solid substantial frame structure independent of the planks or boards of the platform.

The planks Q may be secured to the beams N, O, P, in either of two ways: First, longitudinal wooden strips S may be laid on the tops of the girders N, O, P and bolted thereto, as shown by Fig. 7, and second, the planks are laid loosely on the beams N, O, P, said planks being held from endwise displacement across the beam of the platform J by means of two cleats *q'* *q'*, which are fastened to the lower side of each plank in position to bear against the side beams N, P, of the platform, as shown by Fig. 3 of the drawings, and the planks are further held, against edgewise or lateral displacement, by means of the spac-

ing blocks or strips q'' interposed between the edges of the planks, said spaced blocks or strips being fastened to the edges of one of the boards or planks.

5 I prefer to employ the loose planks held in the manner described because the planks are not perforated with nail holes in which water is apt to lodge and rot the wood, and the planks can be easily lifted out when worn and replaced by other planks without wrenching them out of place.

10 The rear end of the platform J is provided with the pivoted extension J', and the platform is braced and held under tension by the side tie rods T and the bottom tie rod T' as in my former patent. The approach to the draw on the other side from the platform is had by the usual plank structure, the planks being laid crosswise upon the longitudinal girders U, of I-beam form, which are secured to the transverse horizontal beams E.

15 The operation and advantages of my invention will be readily understood and appreciated by those skilled in the art from the foregoing description taken in connection with the drawings.

20 I am aware that changes in the form and proportion of parts and in the details of construction may be made without departing from the spirit or sacrificing the advantages of my invention and I therefore reserve the right to make such changes and alterations as fairly fall within the spirit of my invention.

25 Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a drawbridge, the combination of the groups of piles A, D, each group arranged in transverse series and provided with the horizontal beams E, the longitudinal fixed set of girders upon said beams E, the smooth faced supporting rollers supported between the sets of side girders, an operating shaft provided with the drive gear above and between the middle set of girders, and the platform having the side beams arranged to ride upon the smooth faced rollers and the central beam provided with a rack with which meshes the drive gear, substantially as and for the purposes described.

2. The combination of the three sets of longitudinal girders spaced at suitable intervals from each other and the sets of side girders carrying the series of smooth-faced supporting rollers, the operating shaft provided with the drive gear which is arranged between the girders forming the middle set, the platform, the side beams on the platform in a vertical line between the girders of the two side sets and riding upon the smooth faced rollers, and the central platform beam carrying the rack with which meshes the drive gear, said central platform beam and the drive gear being arranged relatively to each other to guide the beam and platform in their endwise movements, substantially as described.

3. The combination of the piles A, D, provided with the flanged transverse beams E, the longitudinal girders F, G, H, fixed to said transverse beams, the supporting rollers journaled on the side girders F, H, the operating shaft provided with the flanged guide roller k' having the gear teeth between its flanges, the platform having the side beams N, P, which ride upon the supporting rollers, the central flanged beam O fixed to the platform and having its flanges guided between the flanges on the drive gear, and the rack between the flanges of the central beam, substantially as described.

4. The combination with the platform beams, tied or connected rigidly together and forming a slidable frame for the bridge platform, of the planks placed loosely upon said beams and provided with means to limit the end and side play or movement thereof on said beams, substantially as described.

5. The combination of the platform beams, tied or connected rigidly together and forming a slidable frame for the bridge platform and the loose planks provided with the bottom cleats and the side spacing blocks or strips, substantially as described.

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

NATHAN COOPER JESSUP.

Witnesses:

HENRY E. COOPER,
H. I. BERNHARD.