S. CONKLIN.

Truss Bridges.

No. 153,540. Patented July 28, 1874.

Fig. 1.

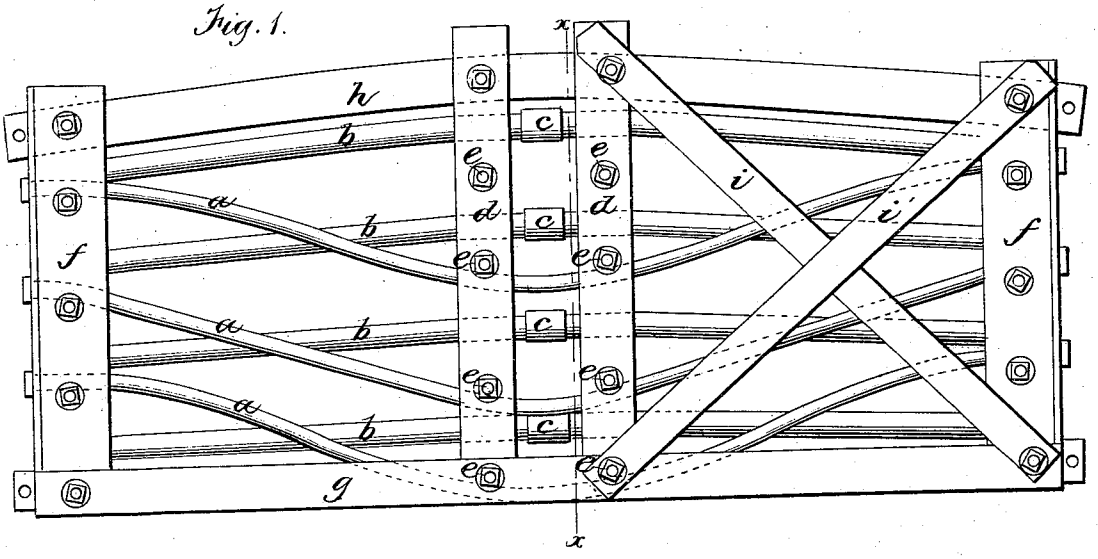
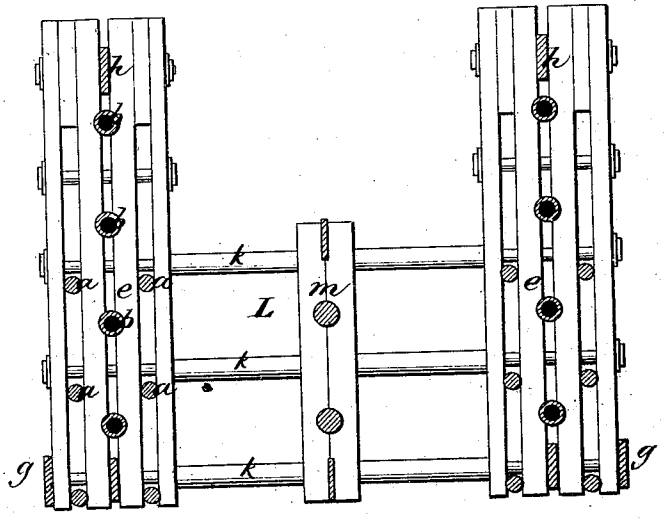


Fig. 2



Witnesses.

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UNITED STATES PATENT OFFICE.

SOLON CONKLIN, OF KIRKWOOD, NEW YORK.

IMPROVEMENT IN TRUSS-BRIDGES.

Specification forming part of Letters Patent No. **153,540**, dated July 28, 1874; application filed February 28, 1874.

To all whom it may concern:

Be it known that I, SOLON CONKLIN, of Kirkwood, in the county of Broome and State of New York, have invented certain new and useful Improvements in Bridges; and I do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings forming part of this specification, in which—

Figure 1 is a side elevation, and Fig. 2 is a vertical cross-section in line *x x* of Fig. 1.

Similar letters of reference in the accompanying drawings denote the same parts.

The object of this invention is to combine, to as great a degree as practicable, durability, strength, and rigidity in a bridge-structure, which shall be light, convenient of construction, and comparatively inexpensive, and at the same time shall be adapted to the convenient support of pipes for the transmission of water, gas, steam, cold, hot, or compressed air, or for the reception of telegraphic cables, or the concealment of powder or other articles in time of war or other exigency rendering it desirable to make such use of the structure. To this end my invention consists in the structure which I will now proceed to describe.

The drawings filed herewith, and forming a part of this specification, are not drawn to scale, and hence do not exhibit the exact proportions of the different parts of the truss; but, the general principles of the structure being correctly indicated therein, any practical bridge-maker can easily determine for himself, by the proper computations, the proportions and dimensions of the parts necessary to form the bridge which he desires in any case to build.

The main principle of my structure consists in strengthening the sides of the truss by a series of tension rods or tubes, *a a a a*, arranged one over the other, as shown in Fig. 1, or preferably two series of the character shown in Fig. 1, arranged side by side, as represented in Fig. 2, combined with a series of larger tubular arches, *b b b*, arranged also one above the other, and curving in a direction opposite to the curve of the tension-rods, both the tension-rods and the tubular arches extending continuously throughout the entire length of the truss, or even of the bridge, when the latter is not of too great length. The tension rods or tubes and the arch-tubes may be actually continuous in structure, or may be, and preferably will be, composed of different pieces united by couplings, as shown at *c c*, or by any other means usually employed for the purpose of connecting the sections of a tube. The intermediate posts *d d* ride upon the tension-rods, their weight being supported on the cross-bolts *e e*, which may be provided with friction-sleeves, to enable the structure to adapt itself more easily to any movement of the tension-rods. The truss may contain any desired number of intermediate posts between the end posts *f f*. The central posts *d d* will, of course, rest in the saddles formed by the curve or angle of the tension-rods, while the posts between *d* and *f* will rest on the slightly-inclined portions of the rods between their angles and their ends, and will be held in place by being bolted to the strong iron plates *g g* extending along the bottom of the truss, and the strong curved wrought-iron plate *h* extending along the top of the truss. Counter-straps or braces *i i'* may be employed between the intermediate posts and the end posts, if desired. Any number of intermediate posts may be employed, at the option of the builder; but in a truss of one hundred feet in length I would recommend placing the central posts *d d* about from three to six inches apart, according to the length of the coupling *c*, and using about eight intermediate posts between the central posts *d* and the ends *f*, arranging them about ten feet apart. This may be varied, however, according to circumstances. The couplings *c c* will abut against the proximate faces of the posts *d d*, and serve as studs to hold them in the proper position relatively to each other. Chafing-plates may be attached to the faces of the posts to form bearings for the ends of the couplings, and prevent them from wearing into the wood when wood is employed. All the posts may be made of iron, or some of iron, or some or all of both wood and iron, suitably fastened together for the purposes required. The two side trusses will be connected together by a series of tubular cross-beams, *k k k*; and when the bridge is intended for two tracks a low central truss, L, may be employed, and may or may not be strengthened by the tension-rods and tubular arches above

described, at the pleasure of the constructer. The cross-beams *k k k* and posts *m m* may be braced and counter-braced in any suitable manner to give the floor sufficient strength and rigidity. In the lower parts of the side truss-frames the cross-beams *k k* extend through the posts and take the place of the bolts *e e*, which rest on the tension-rods. The tubes *a a*, of any span, are to be connected by suitable couplings to the corresponding tubes of the adjacent spans, and the arch-tubes *b b* of the several spans are also to be connected throughout the entire structure, so that the tubes, as channels for the conveyance of air, steam, &c., will each be continuous throughout the entire length of the bridge. At the ends of the bridge they may, of course, be connected to tubes extending wherever desired.

I prefer to use two series of tension-rods, arranged one on each side of the arch-tubes, as shown in Fig. 2, in order that the draft of the rods may be squarely met by the thrust of the braces, and there may be no tendency to twist or warp the frame.

The top plate *h* is very strong, and is suitably bolted to the several posts, as are also the two bottom plates *g g*.

The spaces between the several timbers or plates composing each post may be filled up at top or bottom, or from top to bottom, if desired.

The cross-beams *k k* may extend through larger tubes or sleeves, as shown in Fig. 2, in which case the latter will operate as struts to hold the side frames apart, and will materially increase the rigidity and strength of the structure.

Of course, each side frame may be made double, all the parts above described being duplicated, if desired, in any case where great strength is necessary; and one or more additional strengthening-plates similar to *h h* may be employed in the side frames, but in general it will be unnecessary.

The spans thus made will be very strong and light, and, for small bridges for ordinary carriage-roads or foot-roads, may be put together at the shop and transported bodily to the locality where they are to be used.

I do not claim, broadly, tubes for the carriage of water, gas, &c., arranged on the trusses of bridges; but

I claim as my invention—

1. The series of tension-rods *a a*, arranged one rod over another, and the series of arched tubes *b b*, arranged one over the other, combined with the posts *d f*, substantially as and for the purposes set forth.

2. The two posts *d d*, combined with the arched tubes *b b* and the tube-couplings *c c*, arranged between the posts, and serving as struts or blocks between them, substantially as and for the purpose described.

SOLON CONKLIN.

Witnesses:
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