

D. M. PFAUTZ.
FLYING BRIDGE.

No. 175,150.

Patented March 21, 1876.

Fig. 1.

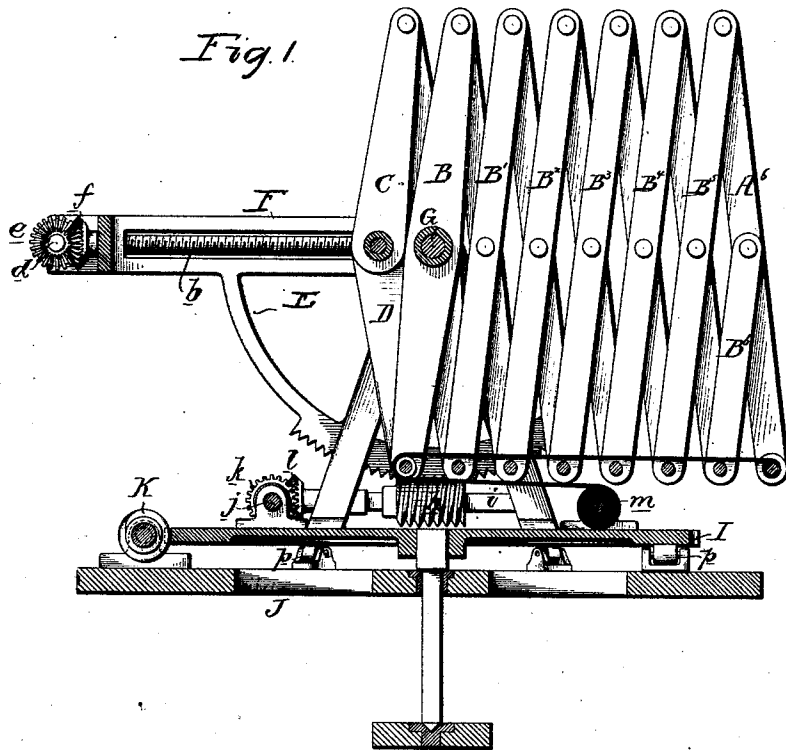
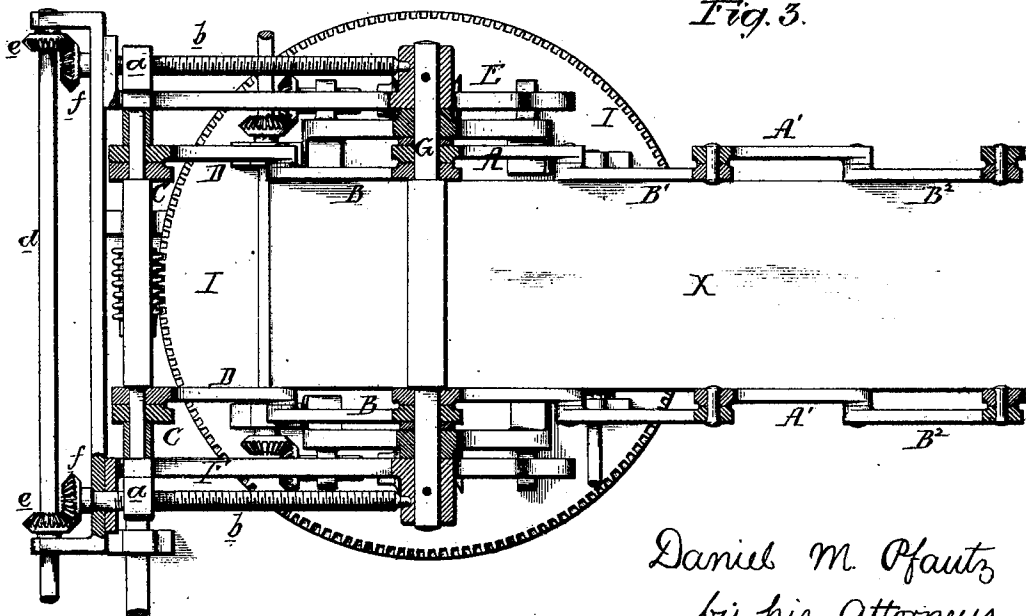


Fig. 3.



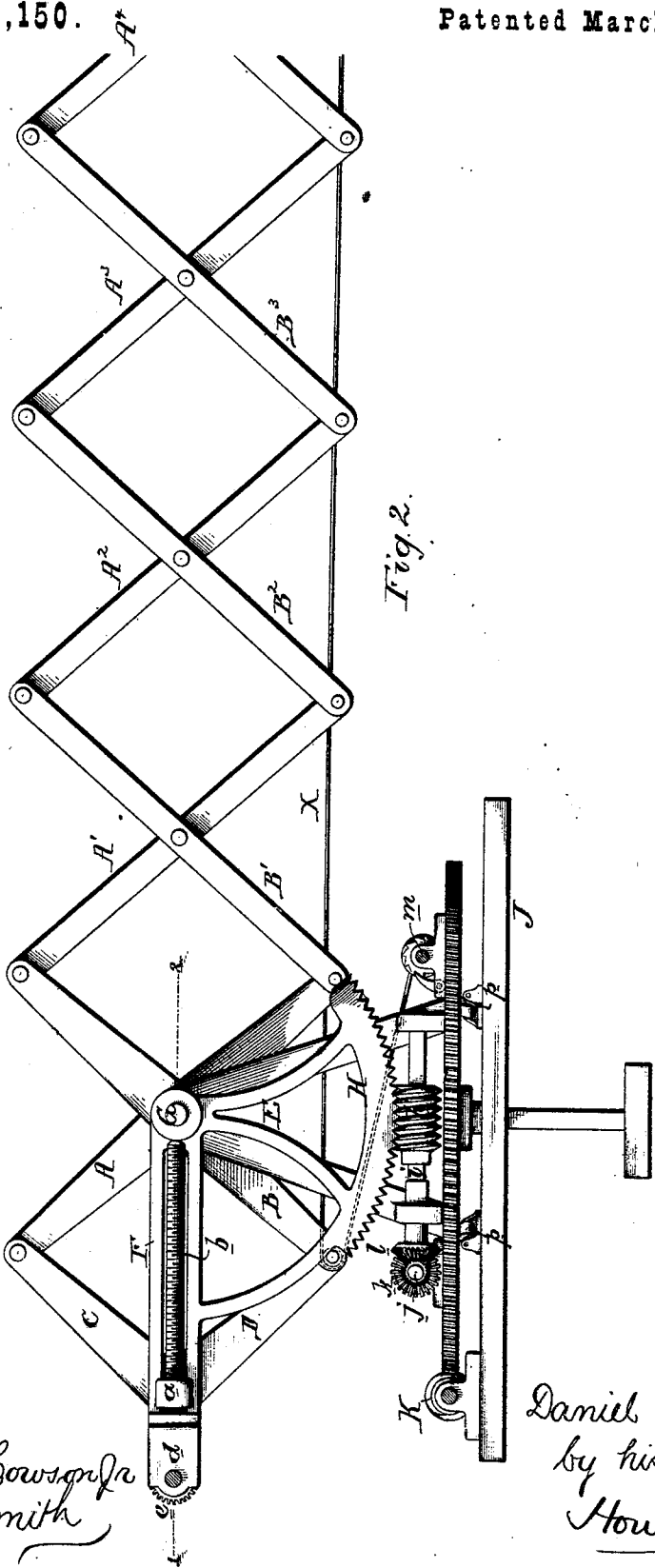
Witnesses, Harry Howson Jr.
Harry Smith,

Daniel M. Pfautz
by his Attorneys
Howson and Son

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UNITED STATES PATENT OFFICE.

DANIEL M. PFAUTZ, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-THIRD HIS RIGHT TO LEOPOLD STERNBERGER, OF SAME PLACE.

IMPROVEMENT IN FLYING-BRIDGES.

Specification forming part of Letters Patent No. **175,150**, dated March 21, 1876; application filed February 17, 1876.

To all whom it may concern:

Be it known that I, DANIEL M. PFAUTZ, of Philadelphia, Pennsylvania, have invented certain Improvements in Bridges, of which the following is a specification:

My invention relates to certain improvements in that class of bridges in which the side trusses are composed of a series of levers hinged together, so as to form what are known as "lazy-tongs," and the object of my improvements is to provide means for facilitating the maneuvering of a bridge of this class. This object I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawing, in which—

Figure 1 is a vertical section of my improved bridge, with devices for operating the same, the bridge being shown in the contracted condition; Fig. 2, Sheet 2, a side view, showing the bridge extended, and Fig. 3, Sheet 1, a sectional plan on the line 1 2, Fig. 2.

The lattice-frames, which form the sides of the bridge when the latter is extended, are each composed of a series of levers, $A^1 A^2$, &c., and $B^1 B^2$, &c., connected together in the manner shown. The first levers A and B of each set are connected to the ends of two arms, C and D , the opposite ends of which are attached to a nut, a , the latter being guided by a slot in the straight portion F of a frame, E , and being adapted to a screw-rod, b , which is supported at both ends, and to which motion is imparted from a counter-shaft, d , through the medium of bevel-wheels e and f . The frames E are pivoted to the shaft G , to which the levers A and B are hung, and each of these frames has a segmental portion, H , provided with teeth adapted to a worm, h , carried by a shaft, i , motion being imparted to the two shafts i from a counter-shaft, j , through the medium of bevel-wheels k and l . The flooring of the bridge consists of a strip, X , of heavy canvas or other strong flexible material, the outer end of which is connected to the lower ends of the outermost levers of the series which form the sides of the bridge, the inner end of the canvas flooring being wound round a shaft, m , which turns in suitable bearings, and to which motion is applied in any suitable manner, in order to wind up the sheet of fabric

as the bridge is being contracted, a pawl and ratchet serving to prevent back motion of the shaft m . All the mechanism above described is carried by a turn-table, I , which has a central shaft adapted to suitable bearings in the foundation J , and the edge of this circular turn-table is toothed for the reception of the coils of a worm, K , carried by a shaft adapted to suitable bearings on the foundation, and arranged to be revolved by the application of any available power. The turn-table I is preferably supported near the edges upon anti-friction rollers p .

The mode of operating the bridge with the above-described appliances is as follows: Supposing the parts to be in the position shown in Fig. 1, the extension of the bridge may be effected by so operating the shaft d and screw-rods b that the nuts a will be caused to move rearward, carrying with them the ends of the arms C and D , and causing all the levers composing the series on each side of the bridge to turn on their pivots and thrust out their extremities, thus effecting the extension, which will continue as long as the nut a is caused to move back, a reversal of the movement of course drawing the ends of the levers together and contracting the bridge. While the bridge is being extended, the sheet of fabric X which forms the flooring will unroll itself from the shaft m , but when the bridge has been extended to the desired extent, this shaft is operated so as to take up the slack, a pawl and ratchet retaining it in position after adjustment. When the bridge is extended, or while it is being extended, its end may be swung around laterally to any desired extent by operating the worm K and base-plate I , or may be raised and lowered through the medium of the worms h acting upon the toothed segmental portions H of the frames E . In order to increase the lateral steadiness of the bridge, the side frames may be connected together at the top or bottom, or both, by sets of levers arranged in the same manner as the side levers.

The above-described bridge is well adapted to the spanning of deep and narrow ravines, rapid rivers, &c., where ordinary bridge-building appliances are not available, and it may also be applied with advantage in place of a

gang-plank to river-steamers of too great draft to approach near the bank. My invention may also, by a slight modification, be used as an extension-ladder or fire-escape, its universal adjustability being of especial advantage in this case.

I claim as my invention—

1. The combination of the two sets of hinged and connected levers forming the side truss-frames of a bridge, with the arms C and D, and the nuts *a*, adapted to the screw-rods *b*, all substantially as set forth.

2. The combination of the side frames of the bridge, composed of levers, as specified, with a flexible flooring attached to the outer end of the bridge, and admitting of being wound on a shaft or roller at the inner end of the bridge, as specified.

3. The combination of the bridge composed of sets of levers described, and the screw-rods

for operating the same, with a turn-table, I, and intervening mechanism by which the outer end of the bridge may be raised or lowered, all substantially as set forth.

4. The pivoted frames E, having straight slotted portions F for the reception of the nuts *a*, and segmental-toothed portions H adapted to worms *h*, all as set forth.

5. The turn-table I, adapted to bearings in the foundation J, and having teeth adapted to a worm, K, on a shaft secured to the foundation, all as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

DANIEL M. PFAUTZ.

Witnesses:

HARRY HOWSON, Jr.,
HARRY SMITH.