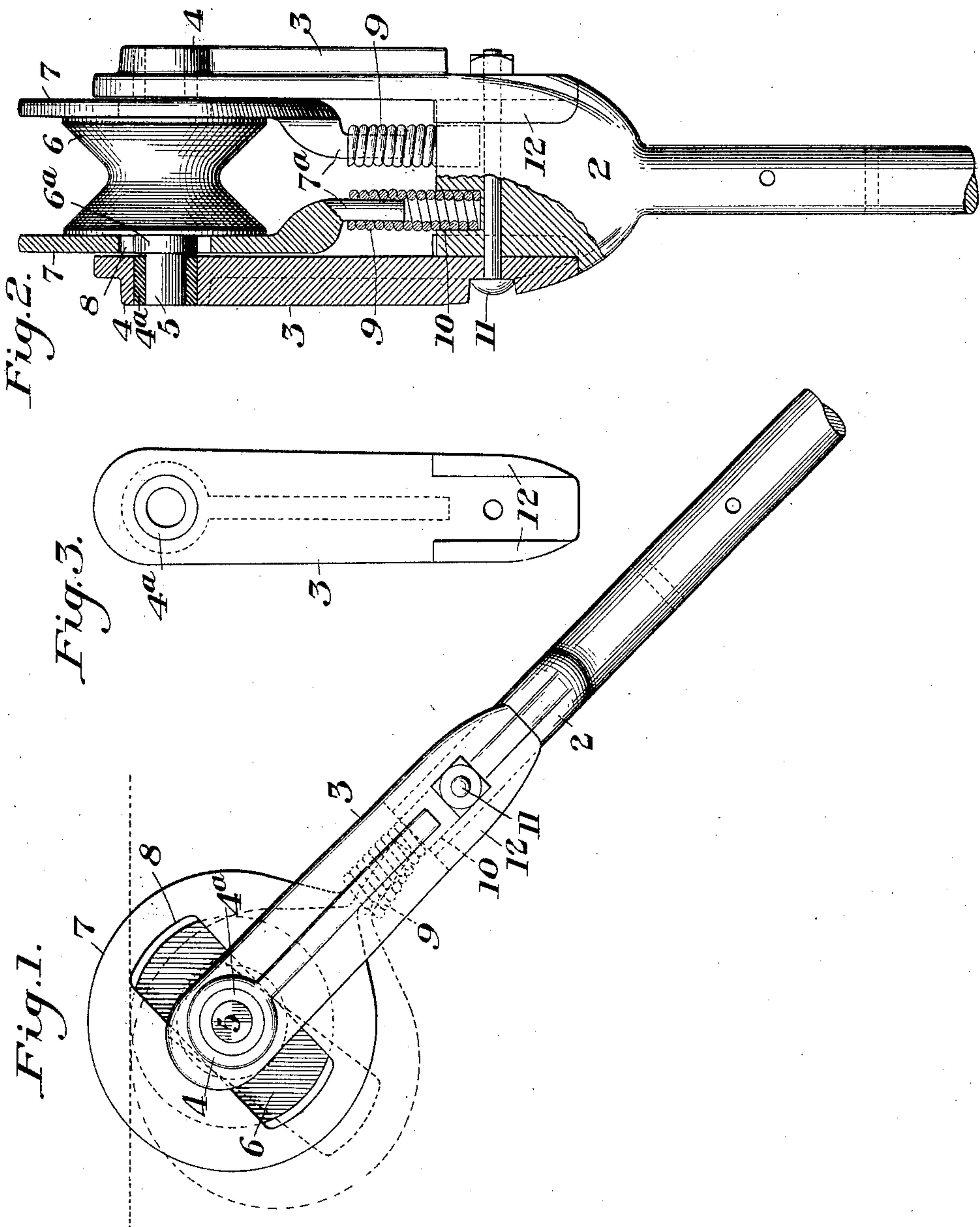


No. 829,641.

PATENTED AUG. 28, 1906.

D. J. ETLY.  
TROLLEY HARP.

APPLICATION FILED DEC. 13, 1905.



WITNESSES  
R. A. Balderson  
Geo. H. Parmelee

INVENTOR  
David J. Etlly



# UNITED STATES PATENT OFFICE.

DAVID J. ETLY, OF PITTSBURG, PENNSYLVANIA.

## TROLLEY-HARP.

No. 829,641.

Specification of Letters Patent.

Patented Aug. 28, 1906.

Application filed December 13, 1905. Serial No. 291,545.

*To all whom it may concern:*

Be it known that I, DAVID J. ETLY, of Pittsburgh, Allegheny county, Pennsylvania, have invented a new and useful Trolley-Harp, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of a trolley-harp embodying my invention. Fig. 2 is a front elevation, partly in section; and Fig. 3 is a detail view of one of the removable harp arms or forks.

My invention has relation to the class of trolley-harps, and is designed to provide novel and efficient means whereby the trolley-wheel is prevented from jumping and leaving the overhead conductor; and it consists in providing a wheel with movable or yielding laterally-arranged guards which normally serve to increase the depth of the wheel-groove, but which will readily yield in passing overhead switches and other overhead suspension devices.

A further feature of my invention consists in the provision of means whereby trolley-wheels may be quickly and readily removed and replaced.

In the drawings, 2 designates the harp, having the arms 3, provided at their upper end portions with bearings 4 for the shaft or spindle 5 of the grooved wheel 6. This wheel 6 has the usual V-shaped groove in its periphery; but the wheel is preferably made somewhat wider than the ordinary wheel.

7 designates the lateral guards, which constitute the main feature of my invention. These guards consist each of an approximately circular plate which is slotted transversely, as shown at 8, to receive loosely therethrough the hub or boss 6<sup>a</sup> of the wheel 6, the diameter of the guard being greater than that of the wheel. The shank portion 7<sup>a</sup> of each guard-plate is flexibly connected to the body portion 2 of the harp preferably by a coil-spring 9, in which the shank is seated and which is held by seating in a socket 10. One of these guards is placed at each side of the wheel 6, between the outer face of the wheel and the inner face of the adjacent fork-arm, sufficient space being provided to permit of a limited lateral movement of the guards as well as a free forward-and-back movement. The guard-plates are symmetrical in form, so that they may be used interchangeably at either side of the wheel, and

also act in the same manner in either direction of movement.

In order to provide for the speedy removal of the wheel and its replacement by a new one in case of breakage on the road, both the fork-arms 3 are preferably made in separate pieces from the body portion 2, being secured thereto by a through-bolt 11. To hold the arms rigidly in place, they are formed with the flanges 12, which engage the front and back faces of the body portion 2.

In order to prolong the life of the harp, the bearings 4 for the wheel shaft or spindle 5 are preferably formed by steel bushings 4<sup>a</sup>, so that when a bushing becomes worn to an undue extent it can be readily driven out and a new one inserted.

In the operation of my improved harp the lateral guards, as will be seen, are normally in a position in which they serve to increase the depth of the wheel-groove, and thereby overcome all tendency of the wheel in jumping to leave the wire. In passing underneath overhead switches or other suspension devices the guards by contact therewith are forced back against the tension of the coil-springs 9 and expose a portion of the periphery of the wheel for contact with the switch or other overhead device, so that they do not in any way interfere with the passage of the wheel by such points. As soon as the wheel leaves the switch or other device the springs 9 at once return the guards to their normal positions. The plates 7 not only act as guards in the manner described, but they also form conducting devices for the current, whereby the springs or other contact devices usually employed for insuring constant electrical connection between the wheel and the harp-frame may be dispensed with.

The advantages of my invention consist in the simplicity of the guard devices and in the efficiency with which they operate to prevent the wheel from leaving the overhead conductor, also in the facility with which the wheel or other parts of the harp may be renewed when broken.

What I claim is—

1. In a trolley-harp, a harp-frame, a wheel journaled therein, guard-plates of approximately circular form, arranged one at each side of the wheel in planes substantially parallel with the end faces of the wheel, and normally projecting beyond the periphery of the wheel and connections between the plates and the harp-frame arranged to permit the



plates to move relatively to the harp-frame and pole to positions eccentric with respect to the axis of the wheel; substantially as described.

5 2. In a trolley-harp, a harp-frame, a grooved wheel journaled in the frame, and guard-plates arranged at opposite sides of the wheel and projecting a short distance beyond the periphery thereof, said plates being flexibly connected to the frame at points  
10 eccentric with respect to the axis of the wheel and movable relatively to the harp-frame and pole; substantially as described.

3. In a trolley-harp, a rigid harp-frame, a  
15 wheel journaled therein, and guard plates or disks at opposite sides of the wheel within the frame and flexibly connected to the frame below the axis of the wheel, said plates or disks having transverse slots through which  
20 the wheel axle or spindle loosely extends; substantially as described.

4. In a trolley-harp, a harp-frame, a wheel journaled therein, guard-disks within the frame at opposite sides of the wheel and flexi-  
25 ble connections between the disks and the frame arranged to permit universal movement of the disks; substantially as described.

5. In a trolley-harp, a harp-frame, a wheel

journaled therein, guard plates or disks at opposite sides of the wheel and having down- 30 wardly-extending shanks, and coil-springs embracing the shanks and secured to the harp-frame; substantially as described.

6. In a trolley-harp, a body portion, forked arms detachably secured to the body portion 35 and carrying bearings for the wheel-spindle, a wheel journaled in said bearings, guard-plates between the ends of the wheel and the forked arms and having downwardly-extending shanks, and coil-springs embracing the 40 shanks and secured to the harp-frame; substantially as described.

7. In a trolley-harp, a harp-frame, a wheel journaled therein, guard plates or disks at opposite sides of the wheel and having down- 45 wardly-extending shanks, said plates or disks having also transverse slots through which the wheel-spindle extends, and coil-springs embracing the shanks and secured to the frame; substantially as described. 50

In testimony whereof I have hereunto set my hand.

DAVID J. ETLY.

Witnesses:

GEO. B. BLEMING,  
GEO. H. PARMELEE.