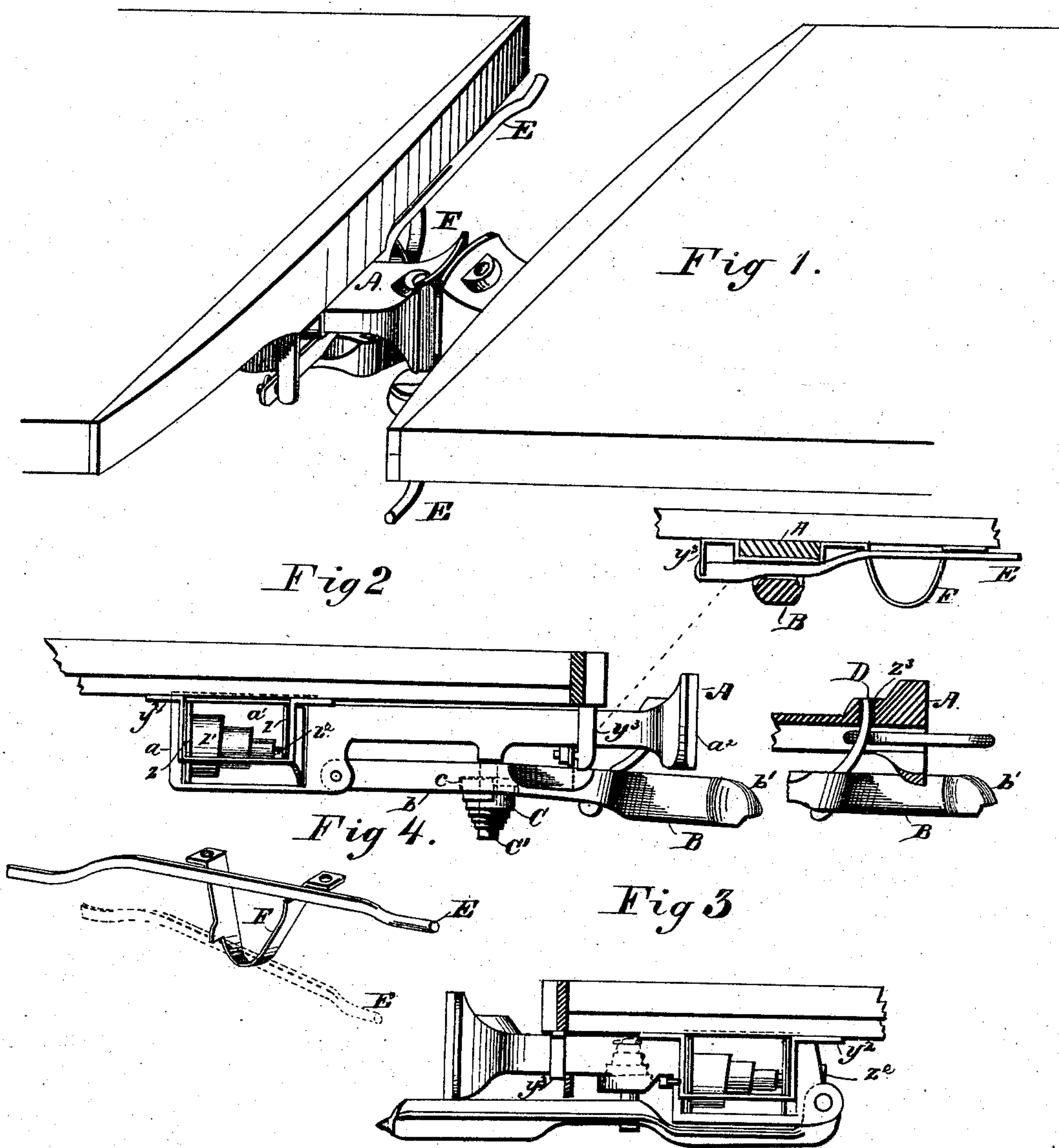


J. D. MILLS.  
Car-Couplings.

No. 156,646.

Patented Nov. 10, 1874.



Witnesses;  
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James J. Lanley

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Attys.

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Fig. 5.

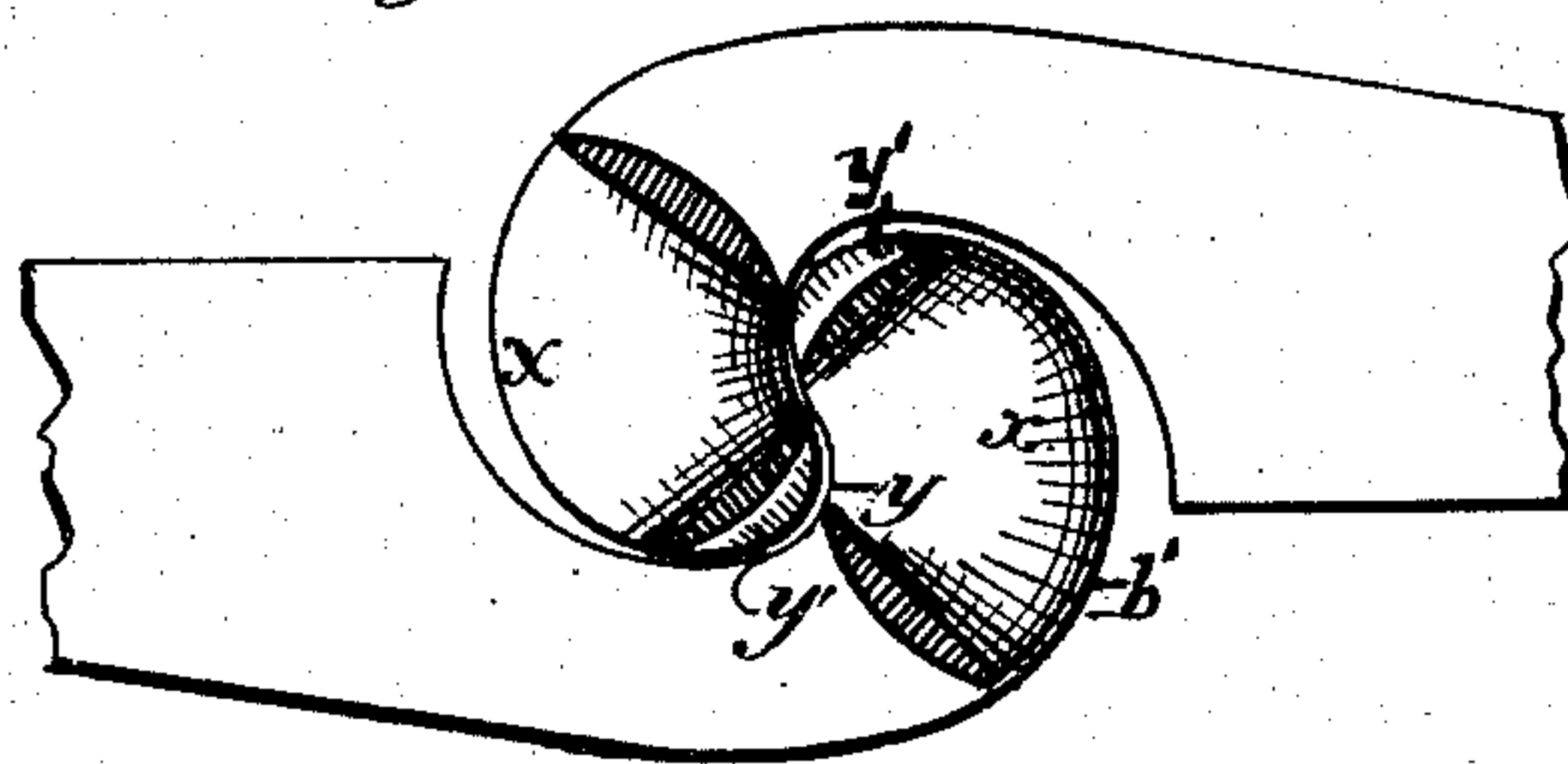


Fig. 6.

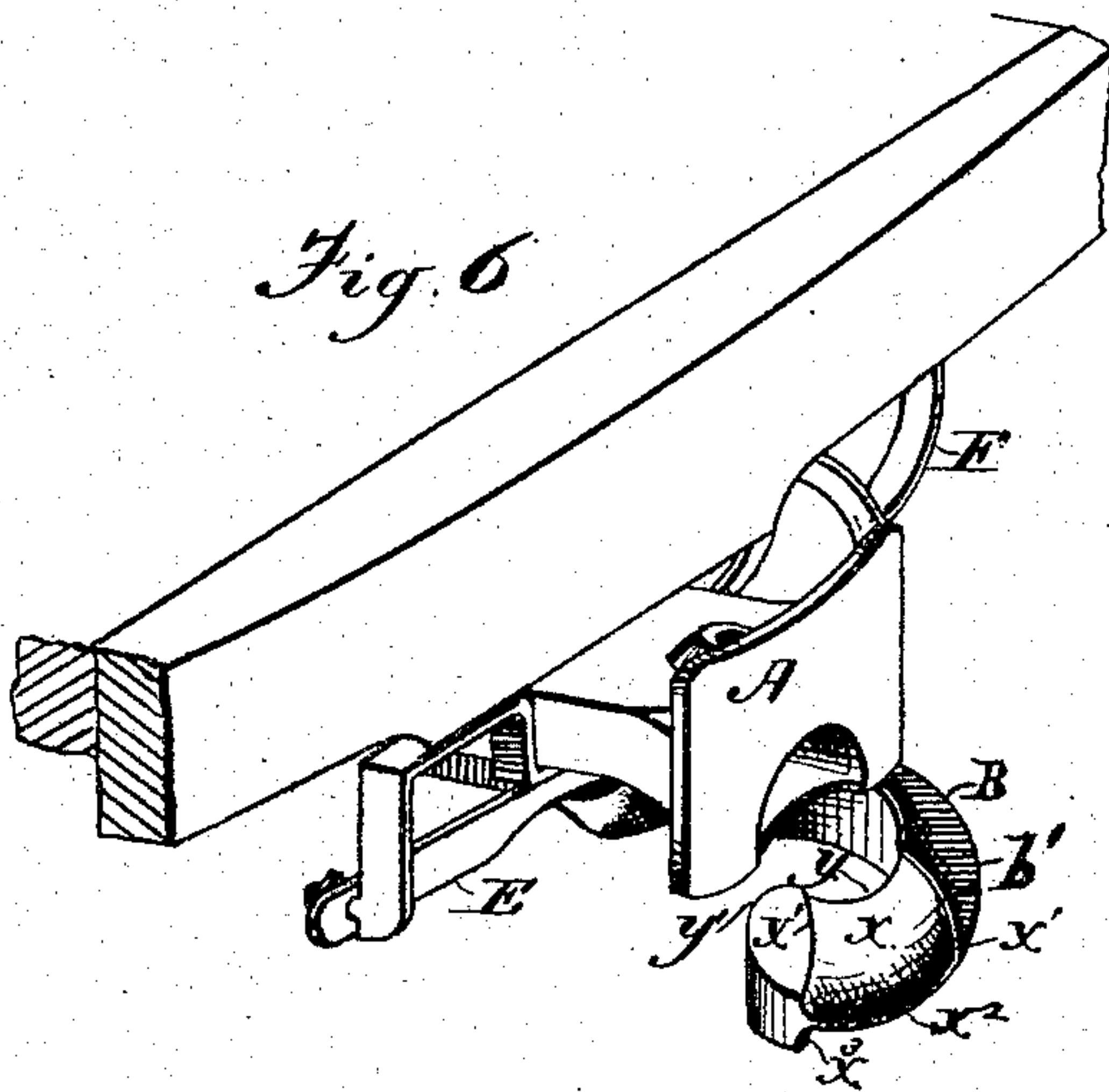
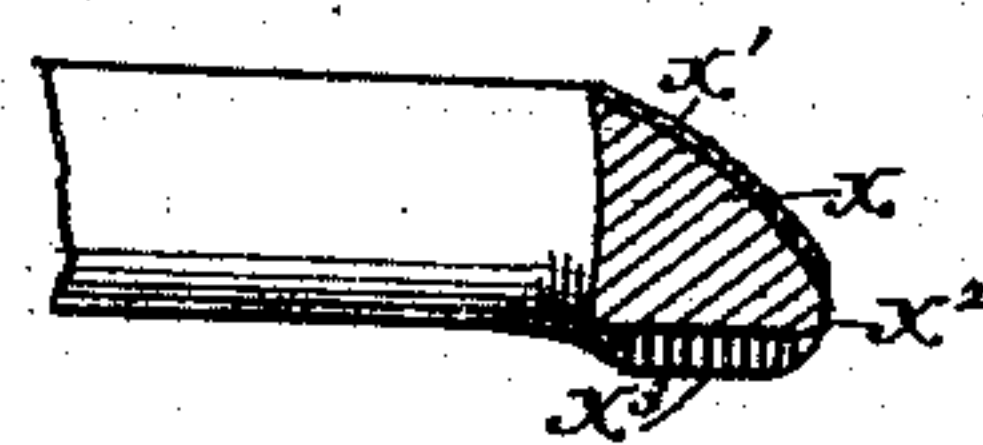


Fig. 7.



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# UNITED STATES PATENT OFFICE.

JOHN DIX MILLS, OF ALEXANDRIA, VIRGINIA.

## IMPROVEMENT IN CAR-COUPPLINGS.

Specification forming part of Letters Patent No. **156,646**, dated November 10, 1874; application filed August 25, 1874.

*To all whom it may concern:*

Be it known that I, JOHN DIX MILLS, of Alexandria, in the county of Alexandria and State of Virginia, have invented a new and useful Improvement in Car-Couplings; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

This invention relates to that class of car-couplings which are provided with vertically-moving hooks, adapted to couple automatically as the cars come together; and consists, mainly, in the combination of a draw-head of proper construction with the vertically-moving hook; and, second, in the employment, in connection with the vertically-moving hook, of a movable pin adapted for use with the ordinary link. It further consists in certain details of construction, which, in connection with the foregoing, will be fully described hereinafter.

In the drawings, Figure 1 represents a perspective view of my improved coupling as applied to the cars. Figs. 2 and 3, side elevations of the coupling; Fig. 4, a perspective view of the lever and catch bar; Fig. 5, a plan view of the hooks; Fig. 6, a perspective view of a single coupling; Fig. 7, a vertical sectional elevation of one of the hooks.

To enable others skilled in the art to make and use my invention, I will now proceed to describe fully its construction and manner of operation.

A represents the draw-head proper, which is provided in the rear with the enlargement  $a$ , having the recess  $a^1$ , and in the front with the buffer  $a^2$ , as shown in Fig. 2. B represents the vertically-moving hook, which is provided with a rearwardly-extended shank,  $d$ , the extreme end of which is suitably hinged or pivoted to the enlargement  $a$ . It may be attached either to the front end of the enlargement, as shown in Fig. 2, or the rear end, as shown in Fig. 3, the point of attachment being determined by the length of the draw-head, the object being to permit the head of the hook to swing in the arc of a large circle, in order that its bearing-face may move as nearly as possible in a vertical plane.  $b'$ , Figs. 5, 6, and 7, represents the hook proper, provided with the upper face, having the inclined recess  $x$ , and

the consequent guiding-projections  $x^1 x^1$ , and lower face having recess  $x^2$ , with consequent guiding-projections  $x^3 x^3$ .  $y$ , Fig. 5, represents the inner recess of the hook, which corresponds in size and shape with its rounded edge  $y'$ , by which means it is adapted to couple with its fellow of identical construction, receiving and holding the end  $y'$  of its fellow, and its own end resting in the recess of its fellow, as shown in my patent of September 30, 1873.

The hook and shank may be constructed of any proper metal, and are preferably provided with ribs, as shown, to give them necessary strength without excessive weight.

C, Fig. 1, represents a spring, adapted to secure the hook in its proper place, and permit it to yield the proper distance for the purpose of coupling and uncoupling. In Fig. 2, the spring is located in a proper recess,  $c$ , in the lower part of the hook, and is united by a fixed bolt,  $c'$ , to the draw-head, as shown. In Fig. 3, the spring is located in a recess in the upper part of the draw-head, and the uniting-bolt is rigidly attached to the shank of the hook, as shown. If desired, the shank and draw-head may each be recessed, and two springs may be employed, one above and one below. D represents a pin, which is loosely held in a slot in the hook, and secured from displacement by an enlargement or pin above and below the slot. Its upper end is curved in such manner, and it is so held in the slot of the hook, that, when strain is exerted upon it by the link of the adjacent car, in connection with which it is employed, it is drawn forward and upward until its extreme upper end enters a hole,  $z^3$ , in the draw-head, and bears against its front side, by which means it is securely held above and below the link. The coupling thus described is suitably connected to the car by means of proper stirrups  $y^2 y^2 y^3$  and draw-plates  $z z$ , the usual spring  $z^1$  and pin  $z^2$  being employed, as shown. In Figs. 2 and 3, the intermediate spring  $z^1$ , between the draw-plates  $z$ , is made less in length than the length of the recess  $a^1$  in the draw-head, for the purpose of giving the latter a slight longitudinal movement before the spring is brought into action. E represents a lever, suitably pivoted at one end to a proper bracket dependent from the car, which is adapted to



rest upon the hook and bear it down, when properly operated, for the purpose of uncoupling the hook. F represents a catch-plate, provided with two notches, one of which is adapted to hold the lever from dropping down when the hook is depressed by the action of the adjacent hook in coupling, and the other to hold the hook in its depressed position when it is desired to keep it from coupling with another car.

The operation is as follows: As the cars come together, the point of one hook strikes the incline of the other, either above or below the horizontal line at the point of the hook, as the case may be, and the lower hook of the two is depressed by the pressure of the other, the spring yielding for that purpose, until each hook enters the recess of its fellow, when the depressed hook moves back to its place through the action of its spring, and the cars are consequently coupled.

The projections upon the sides of the recess serve to guide the entering hook accurately into place, even if the coupling is effected upon a curve.

By the described arrangement of levers cars can be uncoupled on either platform or from either side.

When it is desired to uncouple, one of the hooks may be depressed until its bearing-face is moved out of line with its fellow by operating the proper lever.

Some of the advantages of the described construction are as follows:

By attaching the hook to the peculiarly-constructed draw-head, which is itself attached to the car in the usual well-known manner, the coupling is provided with the proper buffing-surfaces, the hooks are held from displacement vertically, and the coupling is adapted to be readily substituted for those now in common use. By means of the movable pin, the coupling is adapted for use with the ordinary link without compelling the brakeman to go between the cars, the link being guided into the draw-head by the hook, where it is caught by the return of the pin to its place, the lever having been properly depressed to permit its entrance. When the strain is exerted upon the pin, it is pulled forward and upward until its upper end enters the hole  $z^3$ , and rests against its front edge, in which position it is supported at each end. By the employment of the short spring at the rear end of the draw-head, the latter is adapted to have sufficient longitudinal play to permit the locomotive in starting to move the cars successively, instead of starting the entire train at once. This construction, however, is designed only for freight-cars, no lost motion being desirable in passenger-cars. This effect of the short spring may

be obtained by using stirrups shorter in a longitudinal direction than the recess in the draw-head, and by thus compressing the spring between the draw-plates. The peculiar construction of the inner bearing-faces of the hooks, which are formed of arcs of equal circles, is particularly advantageous, because in turning curves the rounded end of the hook in each coupling turns in a correspondingly-curved recess, and consequently there is no grinding of the parts, and sufficient play is permitted to enable a coupling to be used upon the shortest known curves. By means of this construction also the following car in turning curves is drawn strongly in the line of movement in which the preceding car is moving, instead of being permitted to follow its natural tendency to move off at a tangent, as is done with the ordinary link. Another result of this construction is, that the central portions of the coupled cars are strongly held to the center of the track under all circumstances; and hence the usual tendency to vibrate from side to side, and to press more strongly upon one rail than the other in passing curves, is entirely, or almost entirely, avoided. By means of this construction also a practically rigid connection is made between the cars. The tendency of the draw-heads also is to hold down the cars to the track with an amount of force determined by the power of the spring, so that obstacles which would otherwise throw the cars off the track will have no effect upon them. This tendency of the draw-heads prevents the cars from jumping and bouncing upon the track, and causes them to ride easily, even when lightly loaded. These couplings also will not separate when the cars leave the track, unless one of the cars tips over. They are adapted for cars of varying heights, and couple readily under all circumstances.

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

1. The combination of the draw-head A with a vertically-moving hook, B, substantially as described.

2. The combination of the movable pin D with the vertically-moving hook B and draw-head A, substantially as described.

3. The combination of the lever E, the vertically-moving spring-hook B, and the catch-plate F, adapted to hold the lever up or down, substantially as described.

This specification signed and witnessed this 18th day of August, 1874.

JOHN DIX MILLS.

Witnesses:

J. MCKENNEY,  
HARRY C. CLARK.