

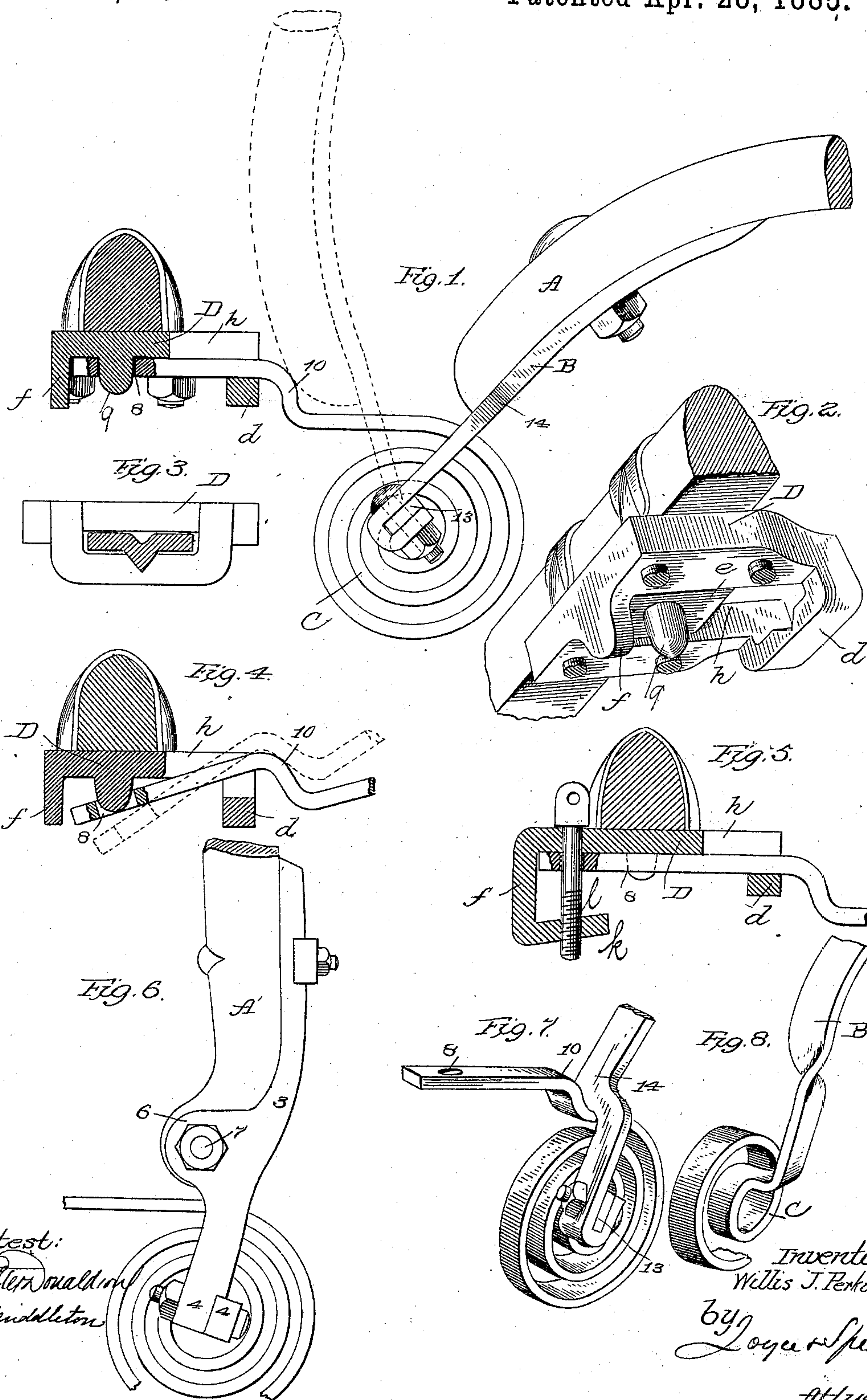
(No Model.)

W. J. PERKINS.

THILL COUPLING.

No. 316,565.

Patented Apr. 28, 1885.



Attest:  
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# UNITED STATES PATENT OFFICE.

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## THILL-COUPPLING.

SPECIFICATION forming part of Letters Patent No. 316,565, dated April 28, 1885.

Application filed July 31, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIS J. PERKINS, of Grand Rapids, in the county of Kent and State of Michigan, have invented a new and  
5 useful Improvement in Thill - Couplings; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to thill-couplings.

My object is, first, to form a flexible con-  
10 nection between the shaft or thill and the axle, and to avoid all forms of joints with their bolts and packings, and liability to get out of repair, to rattle, or become disconnected altogether; secondly, I have aimed to secure  
15 elasticity in the connection, so that the shock or jar arising from obstructions or roughness of roads is lessened or relieved altogether; thirdly, I have provided for easy attachment of the shafts or pole or their detachment from  
20 the axle; fourthly, my object has been to provide for holding the shafts up, whereby the weight of the thills is taken from the horse, and they are held up when the horse is unhitched from the carriage.

25 To these ends my invention consists, first, in an elastic coil formed in the metal bar or strap between the axle and the ends of the shaft or pole branches.

Secondly, my invention consists of a loop  
30 or stud connection, whereby the end of the spring-bar is slipped into place and held firmly by the tension of the spring, exerted by lowering the shafts or pole to their normal condition.

35 In the third place, my invention consists of details, all hereinafter fully and particularly set forth.

In the accompanying drawings, Figure 1 represents the complete coupling in side ele-  
40 vation, with a part of the connection to the axle in section. Fig. 2 is a perspective view of the devices for connecting the coil-strap to the axle. Fig. 3 is a cross-section of the clip-plate, showing a centering device. Fig. 4 is a  
45 side elevation, partly in section, showing the mode of coupling the coil-strap to the clip-plate. Fig. 5 shows a modified form of the clip-plate; Fig. 6, a modification adapting it to be connected to shafts or poles having old  
50 forms of thill-coupling. Fig. 7 is a perspec-

tive view of the coil and strap B. Fig. 8 shows a modification in which the coil and strap are formed in one piece.

In these drawings, A represents the end of an ordinary carriage-thill, which may stand  
55 for the branch of a pole, the invention being equally applicable to either. A strap, B, is bolted to the end of A in the usual manner, and at its rear end is firmly connected to the end of coil C, as hereinafter more particu-  
60 larly explained. This coil is preferably of flat steel bar, the rear end making the connection with the clip upon the axle, and the whole forming a continuation of the strap B from the  
65 end of the shaft to the axle, in which strap there is no working-joint, and all the ordinary joint movement is obtained by the movement or flexure of the coils. Connection between the inner end of the coil and the rear end of the strap B may be made in various ways. In  
70 Figs. 1 and 7 I have shown the inner end of the coil bent laterally and projecting beyond the side of the coil, as shown at 13. The strap B is bent laterally at 14 to give a straight line of draft, and the end is bolted to the laterally-  
75 projecting end 13. Another form of connection is shown in Fig. 6, in which the connecting device consists of a bar formed of two parts, 3 3. (Only one side is shown.) The rear  
80 ends of these parts are made with companion cross-pieces, 4 4, adapted to clamp the inner end of the coils, in this case not turned outward. The front ends of the parts 3 3 are brought together and lie side by side under  
85 the rear end of the thill, to which they are held by clips, as shown in Fig. 6. These parts 3 3 may be adapted to a thill having an ordinary eye for the kind of coupling in ordinary  
90 use, by forming upon the parts ears 6 6, which have holes registering with the eye, and a bolt, 7, holds the parts securely. The ears 6 may be also formed on the strap B to fit the form of thills fitted for the old style of coupling. I do not, however, limit myself to these  
95 modes of connecting the coil to the thill, as many convenient devices may be used for the purpose.

The outer end of the coil is extended to the rear, and is provided with a hole, 8, for connection with the clip-plate D, which is held  
100



to the axle by clips in the ordinary manner. The front edge of the plate is formed with a loop or cross bar, *d*, which is dropped far enough below the front edge of the plate to admit the rear end of coil-spring. The under side of the plate is recessed, as shown at *e*, and is provided with a stud, 9, adapted to the hole in the rear end of the coil-spring. An abutment, *f*, at the rear edge of the plate is adapted to bear against the rear end of the spring, which is fitted simply to the recess stud and abutment. The plate is cut away from the front edge, as shown at *h*, to allow the rear end of the strap to be inserted at an angle, as shown in Fig. 4. The thills are raised for this purpose, and the end of the coil-strap inserted and pushed back until it impinges against the abutment, when the hole in the strap will register with the stud. The shafts are then lowered and their weight brings the rear end of the strap into the recess and over the stud. When the shafts are brought down and attached to the horse, the force of the spring holds this rear end of the coil-strap securely in place, and it cannot be displaced or detached while the horse is attached to the thills. The spring-coil is so adjusted that when the parts are in place and the front ends of the thills are free they will rise, as represented in Fig. 1. A bend, 10, is formed in the coil-spring to act as a stop; but in other modes of connecting the coil to the thill the stop may be otherwise formed.

The tension of the spring should be just sufficient to hold up the thills, and any required number of coils may be used for the purpose—that is to say, to take up the shock and jar arising from obstructions or roughness in the roads. Further, the tension and construction of the coils should be such that the coils will not under ordinary circumstances come into contact with each other.

The automatic holding up of the thills saves space in the carriage-house, prevents the ends of the shafts from wearing, and is a great convenience in hitching and unhitching the horse, and obviates any danger of breaking the shafts.

If desirable, the shafts may be removed with perfect facility and stored separately from the carriage, and they may be replaced as easily and in a few seconds, the replacement consisting, simply, in raising the thills, inserting them, as shown in Fig. 4, and allowing their weight to hold them in place.

I do not limit myself to the special construction of the clip-plate or devices for connecting the coil-strap to the axle. I may vary these devices and still retain the interlocking fastening effects by raising the shafts when inserting the coil-strap into connection with a suitable loop and retaining-stud.

I may for greater security, or for additional securing devices, form upon the lower end of the abutment on the clip-plate a bent arm, *k*, the end of which extends forward under the rear end of the coil-strap when the latter is in place. This end of the arm is low enough

to permit the rear end of the coil-strap to pass in above it when entering in an inclined position. A pin or screw, *l*, may be inserted down through the plate, strap, and arm to hold the strap with additional security. The arm may be bent up a trifle and made elastic, so as to nip the pin or screw and secure it from rattling or accidental displacement. In order to center the coil-strap in the clip-plate, I form the bar *d* with a V-shaped notch, and make a corresponding longitudinal rib on the strap by which the strap is held accurately in the center.

I have described the coil and its connected ends as composed of a flat bar or strap of steel; but it will be obvious that elastic metal of other forms in cross-section may be used as an equivalent.

As regards the coil, an essential feature is the location between the axle and the shaft, whereby it is made to perform the important functions above described, as well as to admit of easy connection and disconnection with the shaft. In this respect it differs from attempts heretofore made to provide a spring, as shown in the United States Patent of Goddard, of February 25, 1868, in which the spring is bent around the axle and forms a partial coil, but is not intended to raise the shafts, and can be removed only by removing the wheels.

It will be understood that the connection formed by the coil between the axle and shaft takes the place of the ordinary joint or hinged connection and performs its functions, whether the coil be sufficiently elastic or not, to raise and support the shafts, and, in addition to the function of the ordinary coupling, it is entirely free from any possibility of rattling, and by reason of its superior simplicity it is less liable to get out of repair. The elasticity of the coil is a separate and distinct feature, and in the connection hereinbefore described performs two functions—namely, that of raising and supporting the shafts or pole and that of holding together the parts which form the easily-removable connection with the axle. It will be further understood that, although this easily-removable connection heretofore described works more advantageously in connection with the spring-coil, either may be used without the other.

I claim as my invention—

1. A thill-coupling consisting of a spring-coil one end of which is connected to the shaft or pole branch and the other to the axle, said coil being located between said axle and the shaft or pole branch, substantially as described.

2. In combination with an elastic strap between the shaft or pole branch and axle, a clip-plate constructed to interlock with the end of the elastic strap, the strap being held in position by the weight of the shaft or pole or tension of the spring, or by both, substantially as described.

3. In combination with the coil-strap, a



clip-plate having an opening and bar on its front edge, said plate and strap having an interlocking device, substantially as described.

4. In combination with the strap and plate having stud and hole, and with the bar *d* on the front edge of the plate, an abutment on the rear edge of said plate, substantially as described.

5. In combination with the abutment of the clip-plate, and with the end of the coil-strap, the arm *k*, and pin, all substantially as described.

6. The coil-strap combined with the thill and clip plate and having a stop-bend, all substantially as described.

7. In combination with an axle, a spring-coil connected at one end with the axle and at the other with the thill, said coil being adapted to support the shaft in an elevated position, and a stop for the shaft, all substantially as described.

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

WILLIS J. PERKINS.

Witnesses:

I. E. MIDDLETON,  
J. B. THOMPSON.