(No Model.)

W. F. LEIGHTON.

THILL COUPLING.

No. 491,182. Patented Feb. 7, 1893.

Fig: 1.

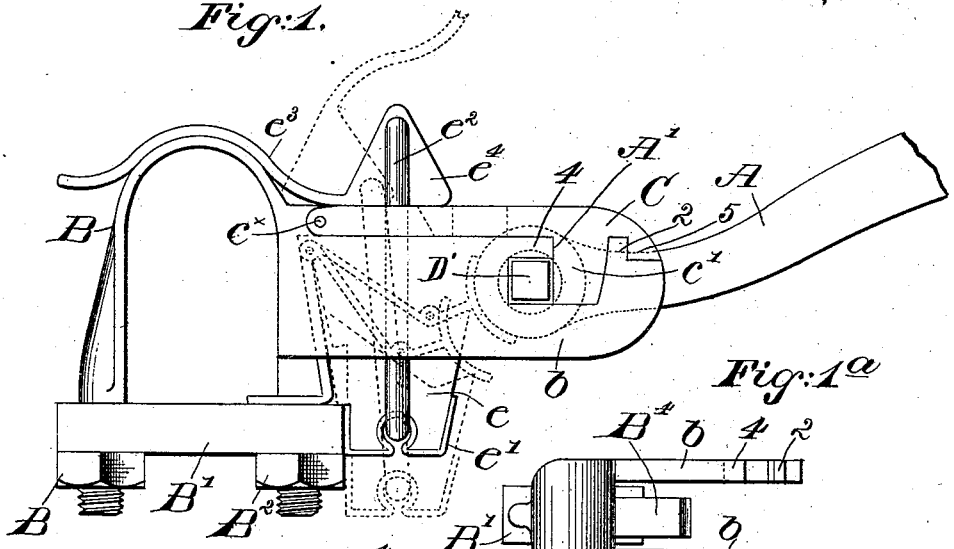


Fig: 1ª

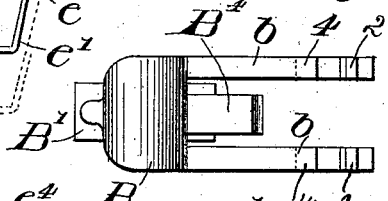


Fig: 2.

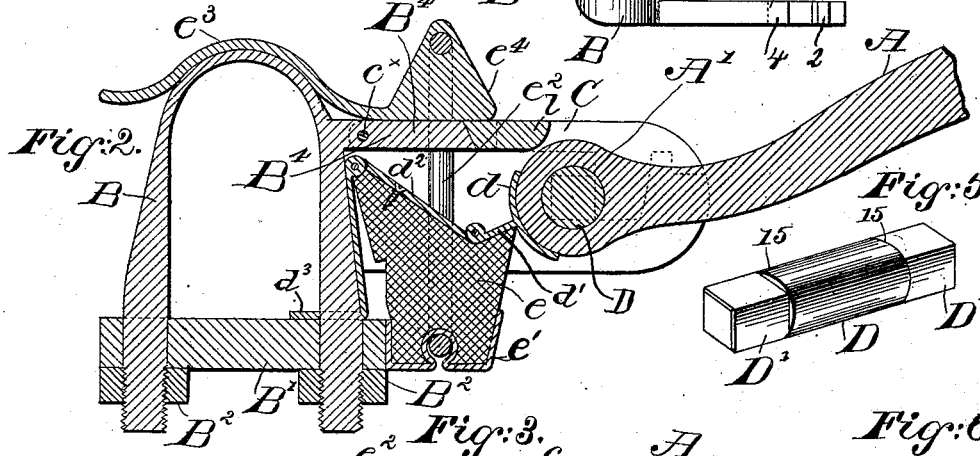


Fig: 5.

Fig: 3.

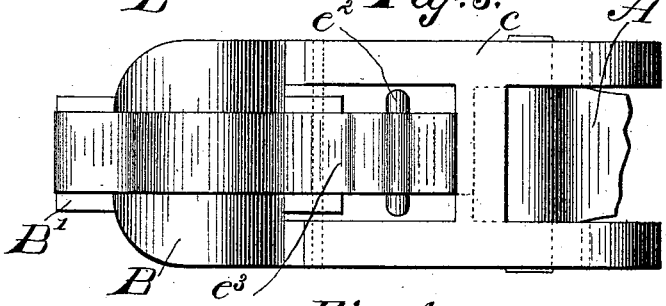


Fig: 6.

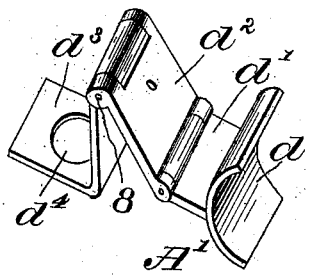


Fig: 4.

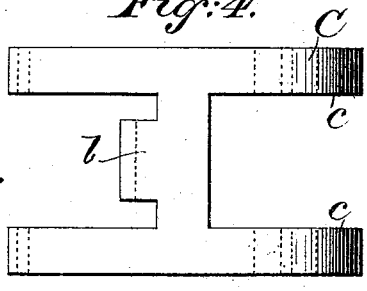
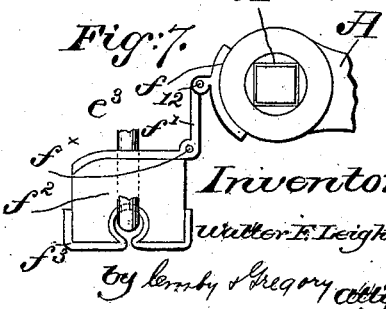


Fig: 7.



Witnesses.
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Emma J. Bennett

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UNITED STATES PATENT OFFICE.

WALTER F. LEIGHTON, OF BOSTON, MASSACHUSETTS.

THILL-COUPLING.

SPECIFICATION forming part of Letters Patent No. 491,182, dated February 7, 1893.

Application filed November 27, 1891. Serial No. 413,199. (No model.)

To all whom it may concern:

Be it known that I, WALTER F. LEIGHTON, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Shaft Shackles or Couplings, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention has for its object the production of a shaft shackle or coupling which will retain the shafts securely, and substantially noiselessly; the construction being such as to do away with threaded bolts and nuts and leave the shafts in condition to be readily and quickly removed to change the shafts for a pole, or vice-versa, or to remove shafts or pole from a carriage to save room.

My improved shackle consists essentially of notched jaws connected preferably with and forming part of a clip to embrace the axle, a shaft holding bolt, a cap plate to retain the bolt and to restrain it from rotation in the said jaws, a bearing plate preferably under the control of a toggle joint, a cam lever to actuate the toggle joint, and a spring.

Figure 1, in side elevation, represents a shackle or coupling embodying my invention. Fig. 1ª shows the axle clip and its arm *b*, constituting the jaw part of the shackle, Fig. 2, a longitudinal section of the shackle shown in Fig. 1. Fig. 3, is a top or plan view of the shackle shown in Fig. 1, with the shaft iron partially broken away. Fig. 4, is a top or plan view of the cap plate. Fig. 5, represents the bolt detached. Fig. 6, represents the bearing plate and the toggle with which it is connected. Fig. 7 is a modification to be referred to.

Referring to the drawings, A represents the shaft iron, it having an eye part A′ of usual shape. The clip B which is shaped to embrace the axle and to enter the plate B′ which crosses the underside of the axle, and the nuts B^2 are and may be of usual shape, but in this instance of my invention I have provided one part of the clip B with arms *b*, *b*, both alike, shaped as best shown in Fig. 1ª, the said arms being parallel and constituting what I denominate jaws of the shackle.

Referring to Fig. 1ª, it will be seen that the arm has an L-shaped opening and a lug or projection 2 near the mouth of the said opening. Each arm has an overhanging lip 4.

The cap C, preferably hinged to the arms *b* by a bolt $c^{\times}$, and shaped as shown, has arms *c* provided with lugs *c′* which enter the L-shaped opening in the arms *b* and substantially fill the space between the projections 2 and 4 of the said arms, as best shown in Fig. 1. A projection 5 on the cap which I prefer to use, is extended down and bears against the outer side of the projection 2. A lug *l* is extended rearwardly between the arms *c*, for a purpose hereinafter described.

Fig. 5 shows the locking bolt for confining the shaft iron between the jaws of the shackle. This bolt D has a substantially cylindrical center to be embraced by the eye part A′ of the shaft iron, the ends of the bolt being reduced in size and made of other than round shape, so that the bolt will not rotate when the shackle is in use, but on the contrary, the ends of the bolt preferably rectangular and lying in the L-shaped slot of the arms *b*, as represented in Fig. 1, will be kept firmly in that position by walls of the L-shaped slot, and by the projections *c′* from the cap, said projections contacting with the front side of the bolt near its end, as clearly shown in Fig. 1.

To prevent the shaft shackle or coupling from rattling, I have provided an anti-rattling mechanism, consisting essentially of a bearing plate preferably convex at its face to bear directly against the rounded inner end of the shaft iron, said bearing, marked *d*, being connected as shown in Figs. 1 to 6, to a lip *d′* hinged to a plate d^2, in turn jointed at 8 to a foot piece d^3, the parts *d′*, d^2 being jointed together after the manner of a toggle joint. To actuate this toggle joint and compel the bearing plate *d* to contact snugly with the rounded end of the shaft iron under all circumstances, I have provided a spring as *e*, preferably made from india rubber or equivalent material, the lower end of the spring resting on a saddle *e′* which rides on a stirrup e^2, the upper end of which receives and forms the fulcrum for a lever e^3 having some sort of a cam end as e^4, so that when the stirrup is drawn up, the saddle by pushing against the underside of the spring, forces the upper side of the latter firmly against and acts to

straighten the toggle, causing the plate d to fit the shaft iron snugly, the spring yielding as required and absolutely preventing rattling and noise.

The foot plate d^3 in the form in which my invention is embodied in Figs. 1, 2 and 6, has a hole d^4, through which is extended one leg of the clip B, so that the said clip acts as an anchor or holder for the toggle and the bearing plate.

In Fig. 7, showing a modified form of my invention, the plate therein marked f is jointed at 12 upon one arm of a lever f', pivoted in the jaws at $f^\times$, the underside of said lever being acted upon by the india rubber or other cushion f^2 resting on a saddle f^3, substantially like the saddle e' of Fig. 2, the saddle riding upon a stirrup, the same as e^2, it in practice at its upper end being mounted upon a lever as e^3, shown in Fig. 2.

To attach the shafts to a vehicle, it will be supposed that the lever e^3 is turned over to the right, as represented in dotted lines, Fig. 1, and that the cap C is turned back on its pivot $c^\times$, and that the shafts are detached. In this condition, the operator with the bolt D in the eye of the shaft iron, will place the shaft iron between the jaws b and put the ends D′ into the horizontal parts of the under-cut notches in the arms b back under the projections 4 thereof. Then the cap plate will be applied, turned down into position so that the projections c' enter the upright portion of the slots or notches in the arms b and form front stops for the ends D′ of the bolt. The bolt being larger at its central part than at its ends leaves shoulders 15 which by contacting with the inner sides of the arms b absolutely prevent any longitudinal movement whatever of the bolt, so that the said bolt cannot possibly escape endwise from the shackle. The cap having been put in place, the operator rests the cam part of the lever e^3 carrying the stirrup e^2 upon the tongue B^4, forming in this instance of my invention part of the clip B, said tongue then being in the position best shown in Fig. 2, adjacent to the lug 1 of the cap C, and turns the said lever over to the left the cam parts of the lever in the movements of the latter sliding partially off the tongue and upon the lug, thereby holding the cap down in place, and also retaining the saddle in elevated position. The plate having a concaved face and acting against the eye part of the shaft iron, and the india rubber or other spring and its supporting and pressing means of whatever form used, constitute what I denominate anti-rattling mechanism.

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

1. A shaft shackle having a jaw-like portion composed of arms having L-shaped under-cut notches, a bolt adapted to fit the eye piece of a shaft iron, and to be held in the under-cut portion of said notches, and shaped to prevent longitudinal motion, a cap pivoted to the shackle at the rear of the notches and having lugs extended from its lower side to enter the open portion of said notches to form a front stop for and to lock said bolt in place, and means to hold the cap in place, substantially as described.

2. A shaft shackle having a jaw-like portion composed of arms having L-shaped under-cut notches, and a projection adjacent the opening thereof, a bolt adapted to fit the eye-piece of a shaft iron, the bolt having its ends polygonal to enter the under-cut portions of said notches and be restrained from rotation therein, and shouldered to prevent longitudinal motion, a cap pivoted to the shackle at the rear of the notches and having lugs extended from its lower side to enter the open portion of said notches and lock the bolt in place, notches in the underside of said cap to be entered by the projections on the arms, and means to hold the cap in place, substantially as described.

3. A shaft shackle having a jaw-like portion composed of notched arms, a bolt adapted to fit the eye piece of a shaft iron, and shaped to prevent longitudinal motion, a cap hinged to said arms and having a lug to lock said bolt, in place and means including a lever, its movable fulcrum, and a cam portion to slide upon and clamp the cap in position to hold the said bolt, substantially as described.

4. A shaft shackle having a jaw-like portion composed of notched arms, a bolt adapted to fit the eye piece of a shaft iron, the said bolt having its ends polygonal to prevent rotation thereof and to enter said notched arms, and being shaped to prevent longitudinal motion, a cap having projections to engage the said arms and having lugs to enter said notches and lock the said bolt, in place, a lever and a spring adapted to be compressed by the said lever, a stirrup connecting said lever and spring, and a bearing plate acted upon by the spring, and in turn acting by its concaved face against the eye part of the shaft iron, substantially as described.

5. In a shaft shackle, notched arms b constituting jaws, a bolt shaped to fit the said notched arms, and be restrained against rotation, therein and against motion in the direction of the length of the bolt, and a covering cap having projections to lock the said bolt, in place a shaft iron, a pivotally supported plate as d having a concaved face to fit the eye part of the said shaft iron, and means to hold the said plate in a yielding manner against the eye part of the shaft iron, and also retain the cap in position, to operate, substantially as described.

6. A shaft shackle having a jaw-like portion composed of notched arms, a bolt adapted to fit the eye piece of a shaft iron, the said bolt having its ends polyonal so as to prevent rotation thereof, and being shaped to prevent longitudinal motion, a cap having dogs to engage the said arms and having a lug to lock the said bolt in place, locking means to

hold the cap in place, and anti-rattling mechanism to co-operate with the eye piece of the shaft iron, and connections between said mechanism and the locking means, to actuate them simultaneously, substantially as described.

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

WALTER F. LEIGHTON.

Witnesses:
FREDERICK L. EMERY,
EMMA J. BENNETT.