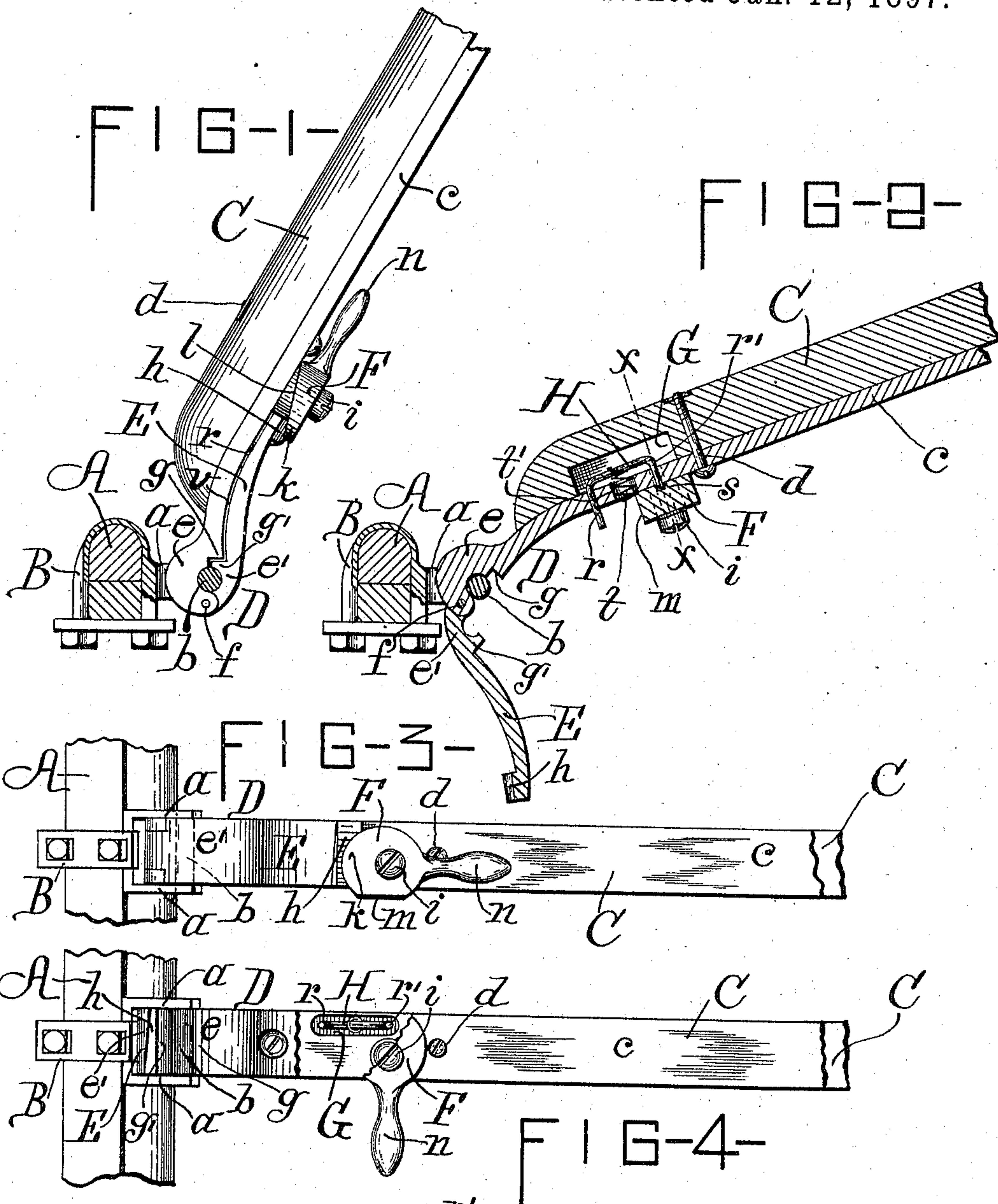


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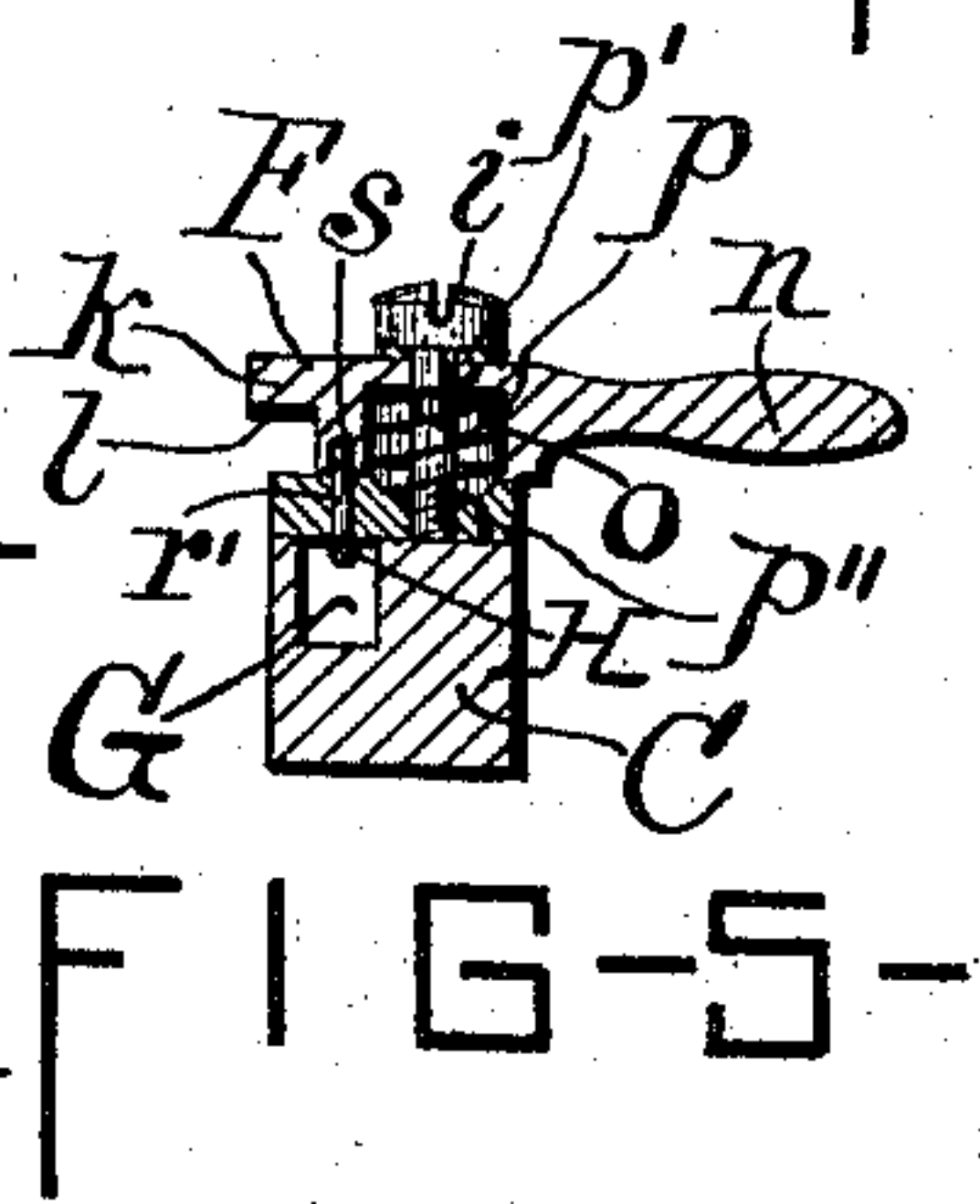
H. W. & H. F. CONNELL.  
THILL COUPLING.

No. 575,212.

Patented Jan. 12, 1897.



ATTEST—  
*E. Schoruck,*  
*E. Schoruck,*



INVENTORS—  
*Harry W. Connell,*  
*and Harry F. Connell,*  
By *Clayton C. Raymond,*  
*their attorney.*



# UNITED STATES PATENT OFFICE.

HARRY W. CONNELL AND HARVEY F. CONNELL, OF SYRACUSE, NEW YORK.

## THILL-COUPLING.

SPECIFICATION forming part of Letters Patent No. 575,212, dated January 12, 1897.

Application filed February 14, 1896. Serial No. 579,264. (No model.)

*To all whom it may concern:*

Be it known that we, HARRY W. CONNELL and HARVEY F. CONNELL, citizens of the United States, residing at Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Thill-Couplings; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation, partially in section, of our improved thill-coupling and connecting parts, showing same as coupled, the thill represented in its normally-raised position, as when in attachment (with a similar companion thill) to a horse or other equine. Fig. 2 is a longitudinal section of our said device, showing the parts in an uncoupling position, the equine being released and the thill (or rather thills) depressed downward, permitting, following requisite manipulation of our coupling: ready detachment and removal of the thill (pair of thills) from the coupling-bolt of the axle's clip member. Fig. 3 is a bottom plan view of our thill-coupling and connecting parts in a coupled position, as in Fig. 1. Fig. 4 is a bottom plan view of same as uncoupled and disposed for the detachment of the thill from the coupling-bolt of the axle's clip, as in Fig. 2; and Fig. 5 is a transverse section taken along dotted line  $xx$ , Fig. 2, for clearer illustration of certain internal parts entering into the construction of our coupling.

Similar letters of reference denote like parts.

Our invention has reference to that species or class of thill or pole couplings wherein the draft-eye is divided and provided with a clamping device or analogous means designed to facilitate the operation of attaching the thills to a vehicle or the detaching of same therefrom with certainty and despatch.

The object of our invention is the production of a simple, effective, and durable coupling of the character stated, wherein our clamping device automatically locks and exerts direct bearing-pressure upon the draft-eye sections; which is retained unlocked fol-

lowing the pivotal diverging of the said sections; wherein the thill is not liable to become uncoupled from the clip's coupling-bolt by reason of non-probable (although perchance possible) accidental pivotal dividing of the draft-eye sections; wherein the hinge of said draft-eye member is relieved of strain or tension, whether exerted forwardly or rearwardly, and in novel details of construction imparting added efficiency and operativeness to our device.

Our invention consists in the novel features of construction, operation, and adaptation hereinafter described, and specifically set forth in the annexed clauses of claim.

A denotes the axle of a vehicle; B, the customary clip secured to the axle and provided with a pair of forwardly-extended ears  $a a$ , connected by a transverse coupling bolt or bar  $b$ .

C illustrates the rear extremity of a thill, and  $c$  the thill-iron, secured to the under side thereof by satisfactory bolts  $d$ , the showing of one being deemed ample for exemplification. Said thill-iron is provided at its rear portion with a divided draft-eye D, which embraces the coupling-bolt  $b$ , which divided draft-eye comprises an upper rigid section  $e$ , constructed integrally with the thill-iron, and a lower pivotally-movable or vertically-swinging section  $e'$ , that is hinged at its rear end to the rear termination of the stationary section  $e$  by means of a transverse pin  $f$ . Forwardly the movable eye-section  $e'$  continues into an elongated lip or extension E, curvilinear longitudinally similarly to that portion of the thill-iron  $c$  underneath which it lies when there retained, for the coupling of parts, by means soon to be specified.

The location of the pin  $f$ , whereby the sections of the draft-eye member are pivotally connected, is such that it lies on a plane practically central beneath the coupling-bolt  $b$  whenever the thill is in a coupled and raised operative position, as very clearly exemplified in Fig. 1, whereby no strain nor tension is entailed upon said hinge-pin incidental to forward draft or thrust of the thill, neither through rearward draft nor backward thrust of said thill, by reason of the restriction engendered by the internal coinciding shoulders or offsets  $g g'$  of the sections  $e e'$ , respec-



tively, of the draft-eye, said shoulders being located directly contiguous the divided socket or bearing encircling the coupling-bolt *b*, the impinging of the shoulders by reason of a backward pressure of the thill practically relieving the hinge-pin *f* of strain, as is apparent by reference to Fig. 1.

The extreme front end of the curvilinear lip or extension *E* of the section *e'* of the draft-eye has an integral inclined cam-seat *h* on its lowerside, which seat, of narrow width, stands transversely across the bottom of said extension, one end of the cam-seat being of the thickness of the contiguous portion of the extension or lip, while through gradual inclination the opposite end attains a thickness somewhat greater than the end opposite, the said formation being clearly shown forth in the first three figures of our drawings.

*F* indicates a cam, of disk-like shape as viewed in plan, said cam being pivotally erected at the under side of the thill-iron continuation *c* of the fixed section *e* of the draft-eye by means of a screw *i* and adapted to partial revolution thereon, said screw or post penetrating vertically through the cam slightly to one side of the cam's center, said screw *i* being so located in reference to the cam-seat terminating the pivoted section *e'* as to insure, when the said cam is in a position holding the aforementioned section against the fixed section *e* of the draft-eye and thill-iron, the ledge or flange-like peripheral portion *k* of said cam overriding and hugging (by reason of its projection or overlapping) the inclined face of the cam-seat, the impinging face of the cam's flange being on such an incline (see *l*) as to cause requisite pressure thereof against the cam-seat of the stated section.

The circular continuity of the cam's periphery is broken at one portion by a retracted straight-edge *m*, which edge extends parallel to the direction of the thill when the cam is in position for upholding the hinged member of the draft-eye and at a right angle thereto whenever the cam is turned correspondingly around. When turned as described, the straight-edge *m* lies parallel to the direction of length of the cam-seat *h* and sufficiently away to be free from contact, thereby permitting of instantaneous dropping of the hinged section *e'* of the draft-eye member.

*n* is the straight projecting handle to the cam, whereby the cam may (by the hand of the operator) be given the ninety-degree revolution requisite to clear same from engagement with its seat, and consequently insuring the dropping of the hinged section *e'*. Concurrently with the said partial revolution of the cam, whereby its handle stands right-angularly to the thill, the said cam is lockingly retained in such carried position until, by means and operation now to be described, it is released from its held position and free to assume its prior one.


Interiorly the cam-body there is a circular

recess or bore *o*, of a diameter somewhat larger than that of the screw *i*, that extends centrally through it and is rigidly connected to the prolongation *c* of the fixed section of the draft-eye by being screwed therein or otherwise suitably secured.

Within the recess or cavity *o* and encircling the uncovered portion of the aforestated screw there is a small yet stiff coiled spring *p*, one extremity of which is seated in a perforation in the bottom portion of the cam member, while the opposite end penetrates and is seated within a perforation existing in the prolongation of the fixed section *e* of the draft-eye, the points of fastening of the spring's ends being indicated, respectively, at *p'p''*. Obviously the function of the spring *p* is, when the cam *F* has its freedom, to instantaneously cause revolution of said cam. The tighter the spring is wound the more decisive and energetic the impulse which is transmitted to impel revolution of the cam.

A washer (shown) may be interposed between the head of the screw *i* and contiguous surface of our cam.

*G* indicates a longitudinal mortise of slight width, extending upward into the wood of the thill at a spot contiguous a lateral edge thereof, of a requisite depth, and lengthwise extending from a point adjacent the rear curvilinear termination of the thill to a point slightly forward of the location relatively of the screw *i*.

*H* denotes an  or staple-like shaped dog movable vertically, the major part of its upper portion being invariably located within the mortise *G*, heretofore described, its longest down-projecting portion *r* extending through a perforation in the thill-iron extension of the section *e* of the draft-eye, substantially as illustrated, while its shorter and parallel cam-engaging portion *r'* passes easily through a perforation in the thill-iron extension of the section *e* at a spot covered by the cam *F*, and so relatively located with respect to a detent *s* in the upper face of the cam *F* that, through the action of a spring *t*, seated in a pocket *t'*, formed in the thill-iron intermediate the hereinbefore-described perforations and connected upwardly to the top section of the dog *H*, (the cam *F*, through manipulation of its handle, being so revolved as to carry its straight-edge *m* parallel to the outer edge of the cam-seat *h*,) opportunity is thereby afforded the end of the portion *r'* of the dog to coincide with and enter the detents *s* of the cam, thus locking aforesaid member in its opened position, it being of course apparent that the movable section *e'* and its extension are not in juxtaposition to the fixed section *e*, and that consequently no upward pressure is being exerted against the dog *H*, as obviously would be the case were the hinged section retained abutting the fixed section of the draft-eye.

Clearly whenever the hinged section *e'* of the draft-eye is swung upward, causing the



cam-seat-carrying lip thereof to lie closely to the fixed section *e*, and the cam *F* so turned as to supportingly secure the movable section specified in such position by reason of the engaging of the operative face of the said cam's shoulder *K* with the face of the cam-seat *h*, the result is that the dog member is impelled upwardly by reason of the pressure of the contiguous upper surface of the movable section and its extension *E* against the protruding extremity of the length *r* of the dog, said uprising of the dog member necessarily causing retraction of the short length *r'* thereof from out the detent or indentation *s* of the cam, and thereby permitting freedom of revolution of the cam to a circumscribed degree.

Our thill-coupling being designed to be interchangeable and applicable to coupling-bolts of varying diameters, evidently the greater the diameter of the coupling-bolt which the draft-eye encompasses the wider the space that will exist between the facing sides of the sections of the draft-eye continuations when said draft-eye is in thorough coupled position, as indicated at *v*, Fig. 1, the cam-face of the cam snugly impinging the cam-seat of section *e'*, irrespective of whether said section lies in close or slightly-withheld relation to the draft-eye's upper section, the effect invariably being the drawing to and retention of the respective eye-sections firmly against the coupling-bolt *b* or such bushing that the said bolt may be provided with.

From the foregoing it will readily be understood that in the constructing of our device we have in view the providing of a minimum space between the facing sides of the continuations of the sections *e e'* when same are lockingly coupled to a coupling-bolt of moderate size or smallest customary diameter. Consequently whatever may be the diameter of the coupling-bolt whereto our divided draft-eye is coupled, requisite embracing of the bolt is assured. Moreover, a self-compensating draft-eye is attained by reason of the fact that as the bolt wears the eye-sections continue with the same compression thereupon as at the outset, when the bolt is new.

Were our construction differentiated and the recesses in the parts *e* and *e'* made larger or smaller to correspond to the diameter of a certain-sized coupling-bolt, clearly same would be properly adaptable to but that particular bolt and not applicable to varied vehicles provided with bolts of varying sizes, as is thoroughly provided for by our formation of thill-coupling.

If wished, an elastic or other suitable cushioning may be interposed intermediately the hook-like extremity of section *e* of the draft-eye and the axle, although in our judgment no real need exists for such-named provision, the invariably close encompassing of the coupling-bolt of the vehicle by the bearings

of the sections of the draft-eye rendering rattling of the parts unlikely—in all likelihood impossible.

Jolting or vibration of a vehicle provided with our thill-coupling will not entail by reason of such jarring any loosening whatever of the draft-eye in relation to its coupling-bolt, but, contrariwise, vibration of the vehicle will, if anything, have the effect of further tightening the draft-eye about its bolt, the impulse of the jarring obviously causing the cams of our devices to all the more hug the cam-seats of the hinged sections of the draft-eyes through the action of cam's springs hereinbefore referred to.

Whenever a thill is in a coupled and operatively-raised position, as shown in Fig. 1, and it is desired to uncouple the same from the vehicle, said thill is permitted to drop, the cam given a quarter-turn, and the hinged section of the draft-eye dropping by reason of its release withdraws pressure from the dog, thereby allowing engagement of the dog with the cam and thereby lockingly retaining the cam open, as clearly delineated in Figs. 2, 4, and 5, and the hinged section of draft-eye lying pendent the raising of the rear of the thill lifts the fixed section of draft-eye off the coupling-bolt. Coincidentally the hinged section being carried upward intermediately its coupling-bolt and vehicle's axle a requisite height to clear said bolt accomplishes complete disconnection or uncoupling of the thill from the vehicle.

When desired to couple the thill to a vehicle, (the pivoted section of draft-eye being in or brought to a depressed plane,) the thill is elevated and next so lowered as to place the opened draft-eye in that relation to coupling-bolt as is illustrated with exceeding clearness in Fig. 2, which occupation being had the hinged section of the draft-eye is carried upwardly under the coupling-bolt, as shown in Fig. 1, the extension *E* of the lower section impinging and carrying inward the protuberant part of the spring-actuated dog member, entailing thereby instantaneous retraction of the farther extremity of the dog from engagement with the cam, which cam, now released, instantaneously and forcibly turns, and by its ledge or shoulder impinging and riding onto the inclined face of the stated cam-seat lockingly retains the draft-eye in the closed position shown in Fig. 1, whereby is insured a continuous compression of the vehicle's coupling-bolt by the draft-eye.

Having described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a thill-coupling, a divided draft-eye comprising a rigid eye-section secured to a thill and a movable eye-section pivoted thereto, a cam pivotally secured to the thill-iron continuation of the rigid section and impelled in one direction by a spring, a spring-actuated dog located in juxtaposition thereto and capable of retaining the cam open through



engagement when said cam is carried to an opened position, and further capable of automatically releasing the cam, and allowing the cam's spring to impel the said cam to a position locking the draft-eye sections in close relation, by the upward swinging of the hinged section, substantially as described.

2. A thill-coupling, comprising a thill-iron provided with a rearwardly-projecting rigid eye-section and a movable eye-section hinged thereto, said sections being provided with coinciding shoulders contiguous the bearing of the coupling-bolt, a cam-seat upon the extremity of the elongation of the movable eye-section, a cam connected with the thill-iron and actuated in a direction for the retention of the eye-sections together by means of an actuating-spring therein, a dog contiguous the cam adapted to be tripped by the pressure of the prolongation of the hinged eye-section when swung upwardly and thereby releasing the cam from a retained opened position and permitting same to swing around into frictional contact with the cam-seat aforementioned, all combined and operating substantially as described and for the purposes set forth.

3. The combination, in a thill-coupling, of a divided draft-eye having a rigid eye-section secured to a thill and a movable eye-section hinged thereto, a cam pivoted to the thill-iron continuation of the rigid section and capable of movement in one direction by an actuating-spring, a dog, operative through a spring, erected in proximity to the cam and capable of retaining same open through engagement therewith whenever said cam is carried to its

opened position, and moreover adapted to automatically release the cam, and allow the cam's spring to propel said cam to such position as to lockingly hold the draft-eye sections closely one to the other through raising of the hinged section of the draft-eye, all arranged and operating substantially as set forth.

4. In a thill-coupling, in combination, a thill-iron terminating rearwardly in a rigid eye-section having a movable eye-section pivoted thereto, coinciding squared shoulders to the sections adjacent the bearings of the coupling-bolt, a cam-seat at the end of the elongation of the hinged eye-section, a cam pivoted to the external face of the thill-iron and capable of turning in requisite direction for the retention of the eye-sections together, an actuating-spring erected therein, and a dog, working within a mortise in the thill, adapted to be tripped by the pressure of the prolongation of the pivotally-movable eye-section when same is carried upwardly and to release the cam from a locked opened position and permit same to turn into engagement with the cam-seat, all constructed and operating substantially as described and for the purposes specified.

In testimony whereof we affix our signatures, in presence of two witnesses, this 3d day of January, 1896.

HARRY W. CONNELL. [L. S.]  
HARVEY F. CONNELL. [L. S.]

Witnesses:

WM. C. RAYMOND,  
ARTHUR RAYMOND.