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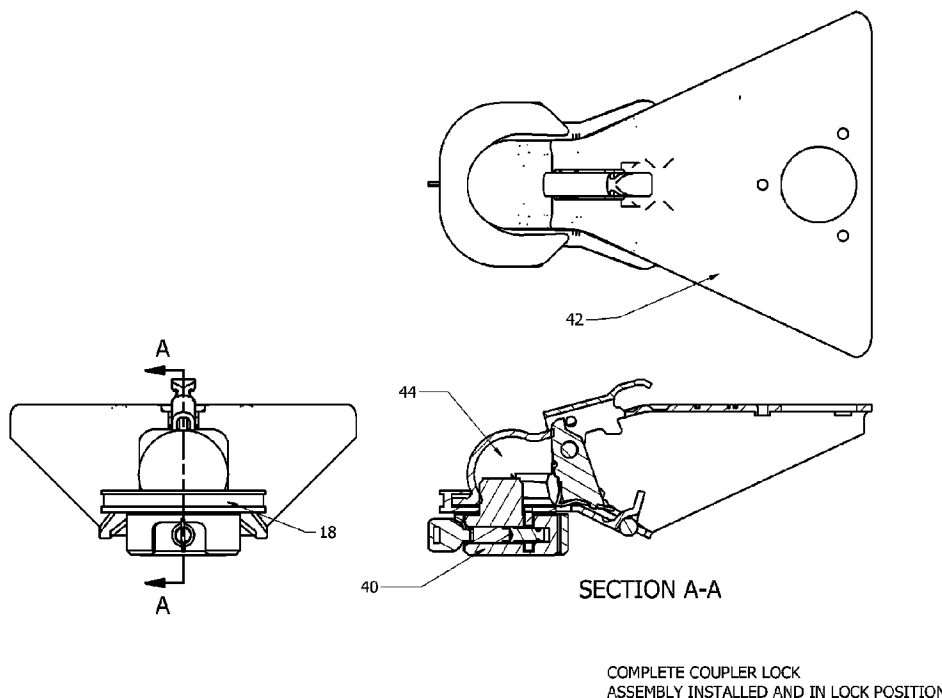
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(54) Title: TRAILER COUPLER LOCK



(57) **Abrégé/Abstract:**

A trailer coupler lock includes a coupler lock body and pin body assembly. The coupler lock body retains the pin body assembly and slides horizontally onto a trailer coupler. When a cage of the lock body is in position under the trailer coupler, the pin body assembly is slid upward through the cage and a protruding section of the pin body passes via a top hole in the cage to enter into the coupler ball socket. While the pin body is in this position, a key is utilized to slide a shackle on the pin body assembly through a hasp on the lock body thereby blocking retraction of the pin body and locking the whole assembly together onto the trailer coupler. In this locked position, the protruding section of the pin body secures the coupler lock body to the trailer coupler and prevents an unwanted union with a trailer hitch.



ABSTRACT OF THE DISCLOSURE

A trailer coupler lock includes a coupler lock body and pin body assembly. The coupler lock body retains the pin body assembly and slides horizontally onto a trailer coupler. When a cage of the
5 lock body is in position under the trailer coupler, the pin body assembly is slid upward through the cage and a protruding section of the pin body passes via a top hole in the cage to enter into the coupler ball socket. While the pin body is in this position, a key is utilized to slide a shackle on the pin body assembly through a hasp on the lock body thereby blocking retraction of the pin body and locking the whole assembly together onto the trailer coupler. In this locked position, the protruding
10 section of the pin body secures the coupler lock body to the trailer coupler and prevents an unwanted union with a trailer hitch.

TRAILER COUPLER LOCK

BACKGROUND OF THE INVENTION

(1) Field of the Invention

The invention pertains generally to trailer coupler locks. More specifically, the invention relates to
5 a trailer lock for “ball” type trailer couplers that is more difficult for thieves to breach without
extensive time & tools.

(2) Description of the Related Art

Trailer theft continues to rise as thieves become more emboldened and professional. Both
residential and industrial areas are prone to trailer theft in the minimal time it takes to back up to a
10 trailer, hook up and drive away.

Most currently available locks can be breached quite easily with a hammer, pry bar, or battery
powered grinder. Some known designs feature an external retainer bar which holds the lock body
in position; however, these designs can be cut with bolt cutters or battery powered tools. Another
design of trailer lock utilizes a notched rail and catch, which can be broken with an impact, or the
15 whole lock body can be forced off the trailer coupler with a pry bar. Yet other existing designs
feature a body vulnerable to hammer and pry bar.

BRIEF SUMMARY OF THE INVENTION

It is an object of some embodiments of the invention to provide a locking mechanism and
associated trailer coupler lock suitable for usage with “ball” type trailer couplers.

20 It is an object of some embodiments of the invention to increase the difficulty of trailer theft by
providing a hidden shackle and hasp style trailer coupler lock to secure parked trailers.

According to an exemplary embodiment of the invention there is disclosed a trailer coupler lock
that includes a pin body assembly that is slidable to move in a lock position upward into a coupler
ball socket, which thereby secures the coupler lock body.

25 According to an exemplary embodiment of the invention there is disclosed a keyed trailer coupler
lock system for quick installation when trailer security is required. An advantage of some
embodiments is that the trailer coupler lock system can secure parked ball-type trailers including
travel, boat, recreational, cargo and industrial trailers.

These and other advantages and embodiments of the present invention will no doubt become apparent to those of ordinary skill in the art after reading the following detailed description of preferred embodiments illustrated in the various figures and drawings.

5 **BRIEF DESCRIPTION OF THE DRAWINGS**

The invention will be described in greater detail with reference to the accompanying drawings which represent preferred embodiments thereof:

FIG. 1 illustrates a plurality of views including perspective view, front-side view, top view, and cross sectional view of a coupler lock body according to an exemplary embodiment.

- 10 FIG. 2 illustrates views including perspective view, side view, top view, and cross sectional view of a pin body according to an exemplary embodiment.

FIG. 3 illustrates views including perspective view, front view, side view, and cross sectional view of a pin body assembly according to an exemplary embodiment.

- 15 FIG. 4 illustrates views including top views and cross sectional views illustrating a complete coupler lock assembly formed by the coupler lock body, pin body and pin body assembly of FIGS. 1-3 with the shackle and lock cylinder in a lock position and a release position, respectively.

FIG. 5 illustrates a plurality of views including top view, front-side view, and cross sectional view of the complete coupler lock assembly of FIG. 4 configured in the release position for installation to a trailer coupler.

- 20 FIG. 6 illustrates a plurality of views including top view, front-side view, and cross sectional view of the complete coupler lock assembly of FIG. 4 configured in the lock position post after installation to the trailer coupler.

DETAILED DESCRIPTION

- 25 FIGS. 1 to 6 illustrates a plurality of components and views of a trailer coupler lock according to an exemplary embodiment.

For convenience of description, the following reference numerals are utilized:

ITEM #	DESCRIPTION
10	TRAILER COUPLER FLANGE RETAINER
12	PIN BODY GUARD
14	HASP
16	PIN CATCH
18	COUPLER LOCK BODY
20	LOCK CYLINDER BORE
22	SHACKLE RETAINER PIN HOLES
24	HASP POCKET
26	CATCH PLATE
28	CATCH TROUGH
30	PIN BODY
32	LOCK CYLINDER
34	SHACKLE RETAINER PINS
36	SHACKLE
38	KEY
40	COMPLETE PIN BODY ASSEMBLY
42	TRAILER COUPLER
44	TRAILER COUPLER BALL SOCKET

The trailer coupler lock features a large pin body 30 which houses a hidden shackle 36. The coupler lock body 18 has a hidden hasp 14 which accepts the shackle 36 when the pin body 30 is in lock position as shown in FIG. 4, securing the coupler lock body 18 on the trailer coupler 42 as shown in FIG. 6. Once the lock assembly is in place, there is no open access to compromise the hidden hasp and shackle. The design of the lock cage fits tight to the coupler profile which eliminates openings for a pry bar to fit.

FIG. 1 illustrates the coupler lock body 18, which is the foundation of the whole lock assembly and houses the pin body assembly 40. FIG. 2 illustrates the pin body 30 machined for all lock hardware. FIG. 3 illustrates the pin body assembly 40 showing the pin body 30 with lock cylinder 32, shackle 36 and shackle retainer pins 34 installed. FIG. 4 illustrates the complete coupler lock assembly showing the coupler lock body 18 and pin body assembly 40 together in lock and release positions.

A method of installing and using the trailer coupler lock of FIGS. 1-4 is described in FIGS. 5-6. FIG. 5 illustrates the complete coupler lock pre-installation, where the lock assembly is positioned in relation to the trailer coupler before installing. FIG. 6 illustrates the complete coupler lock assembly installed in lock position after installation. In the configuration of FIG. 6, the trailer coupler lock is activated and acts as a security system preventing the trailer from being attached to

a trailer hitch.

In this embodiment, the trailer coupler lock comprises two main components that are put together to form a coupler lock assembly:

1. Coupler lock body 18

5 The coupler lock body 18 made of metal is the main structure of the lock. It slides onto the trailer coupler and retains the pin body assembly 40. The cage portion of the body 18 features the hidden hasp 14 which accepts the pin body shackle 36. The cage houses the pin body when assembly is complete.

2. Pin body 30

10 The pin body 30 machined from metal fits into the coupler lock body 18. It has a hasp pocket 24, key cylinder and shackle. The pin body is what fits into the coupler ball socket 44 when in lock position shown in FIG. 6.

The coupler lock body 18 retains the pin body assembly 40 and together are one working assembly. The coupler lock body 18 slides horizontally onto the trailer coupler as illustrated in FIG. 5. When
15 the cage is in position, the pin body assembly 40 is slid upward into the coupler ball socket 44, which secures the coupler lock body 18 in the lock position of FIG. 6. After the pin body is in position, the key 38 slides the shackle 36 through the hasp 14, locking the assembly together onto the trailer coupler and preventing an unwanted union with a trailer hitch.

An advantage of the lock design and method of installation of this embodiment is that the assembly
20 acts as a trailer antitheft lock and is easily installable any time a trailer is disconnected from the tow vehicle.

According to an exemplary embodiment, a trailer coupler lock includes a coupler lock body and pin body assembly. The coupler lock body retains the pin body assembly and slides horizontally onto a trailer coupler. When a cage of the lock body is in position under the trailer coupler, the pin
25 body assembly is slid upward through the cage and a protruding section of the pin body passes via a top hole in the cage to enter into the coupler ball socket. While the pin body is in this position, a key is utilized to slide a shackle on the pin body assembly through a hasp on the lock body thereby blocking retraction of the pin body and locking the whole assembly together onto the trailer coupler.

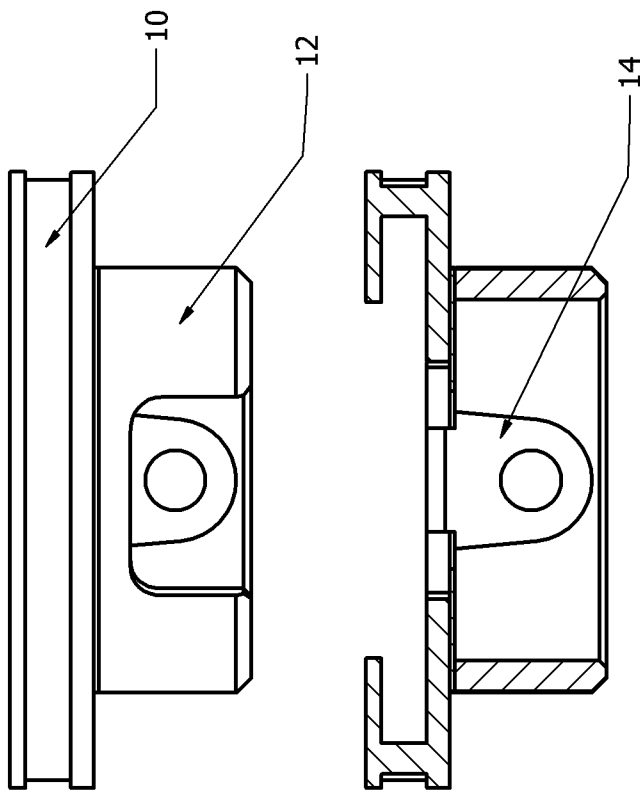
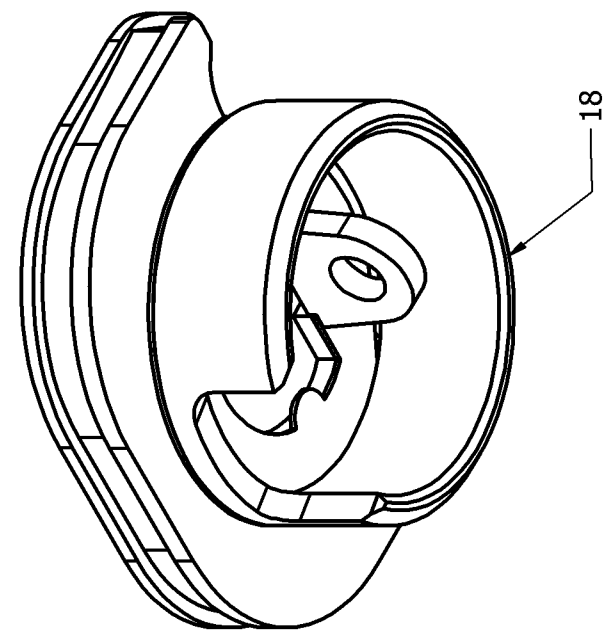
In this locked position, the protruding section of the pin body secures the coupler lock body to the trailer coupler and prevents an unwanted union with a trailer hitch.

Although the invention has been described in connection with preferred embodiments, it should be understood that various modifications, additions and alterations may be made to the invention by one skilled in the art without departing from the spirit and scope of the invention. For example, the steps of the above-described and illustrated method of installing the trailer coupler are not restricted to the exact order shown, and, in other configurations, described / shown steps may be omitted or other intermediate steps added. In yet another example modification, one or more springs may be incorporated into the pin body assembly to retract the shackle.

- 10 Functions of single units may be separated into multiple units, or the functions of multiple units may be combined into a single unit. All combinations and permutations of the above described features and embodiments may be utilized in conjunction with the invention.

WHAT IS CLAIMED IS:

1. A trailer coupler lock as shown and described herein.
- 5 2. An apparatus as shown and described herein.
3. A system as shown and described herein.
4. An assembly as shown and described herein.
- 10 5. A method as shown and described herein.



SECTION A-A

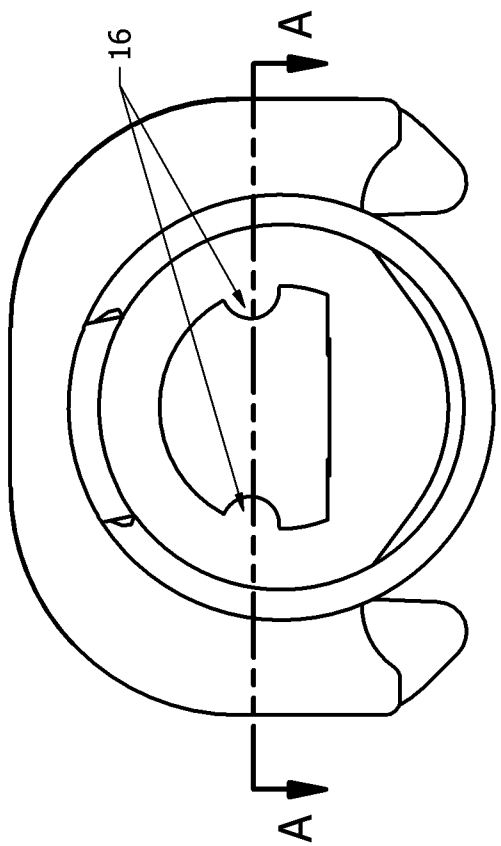
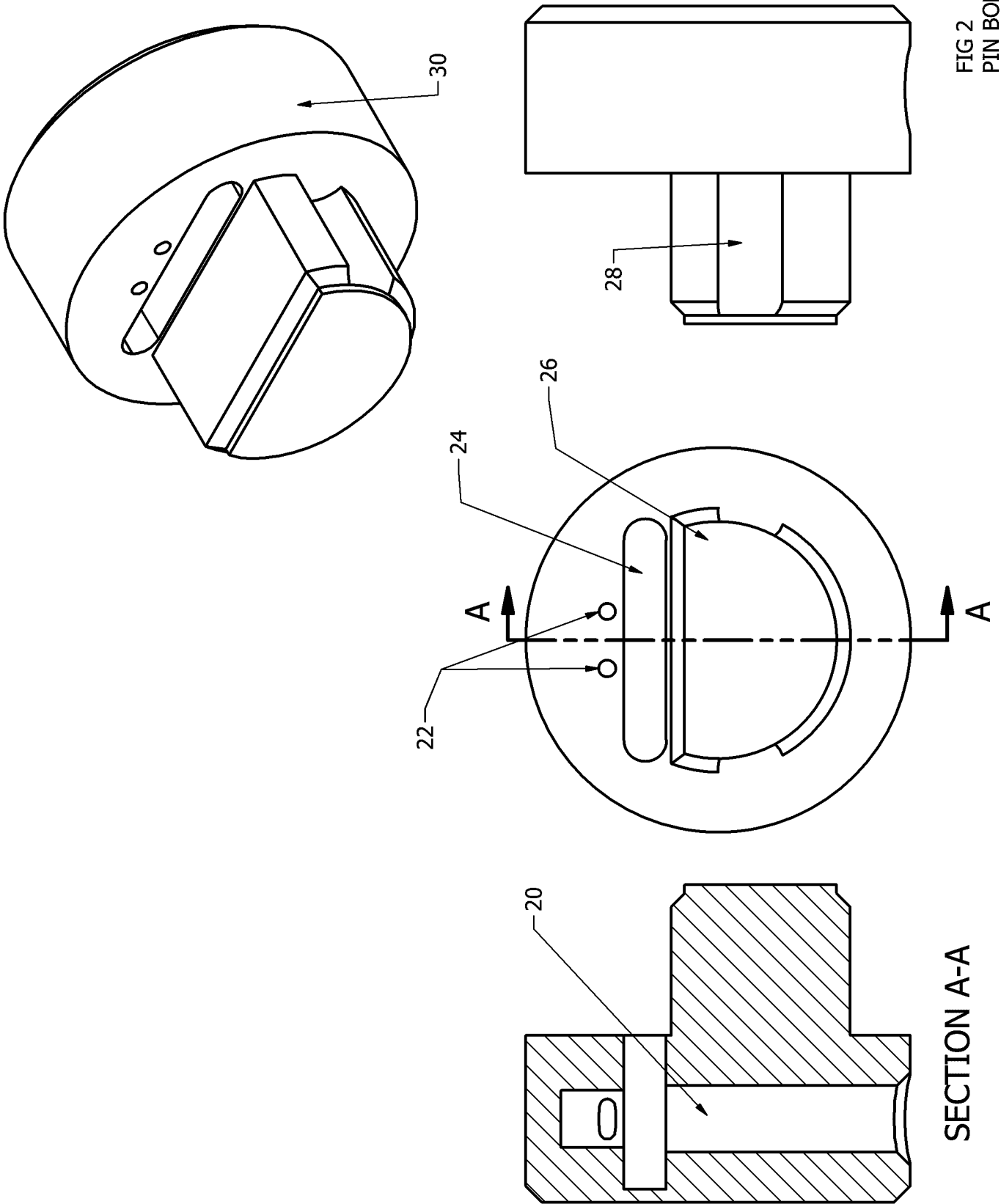


FIG. 1
COUPLER LOCK BODY

FIG 2
PIN BODY



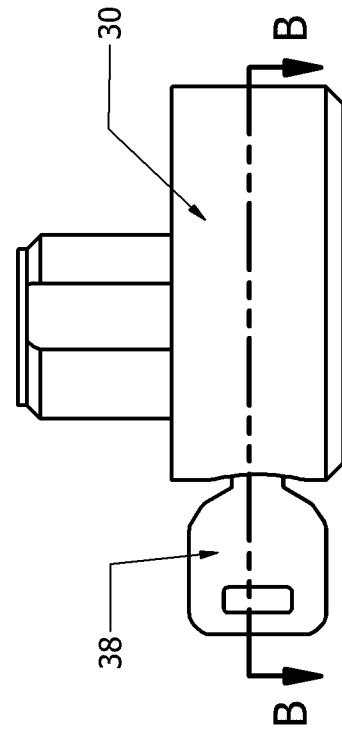
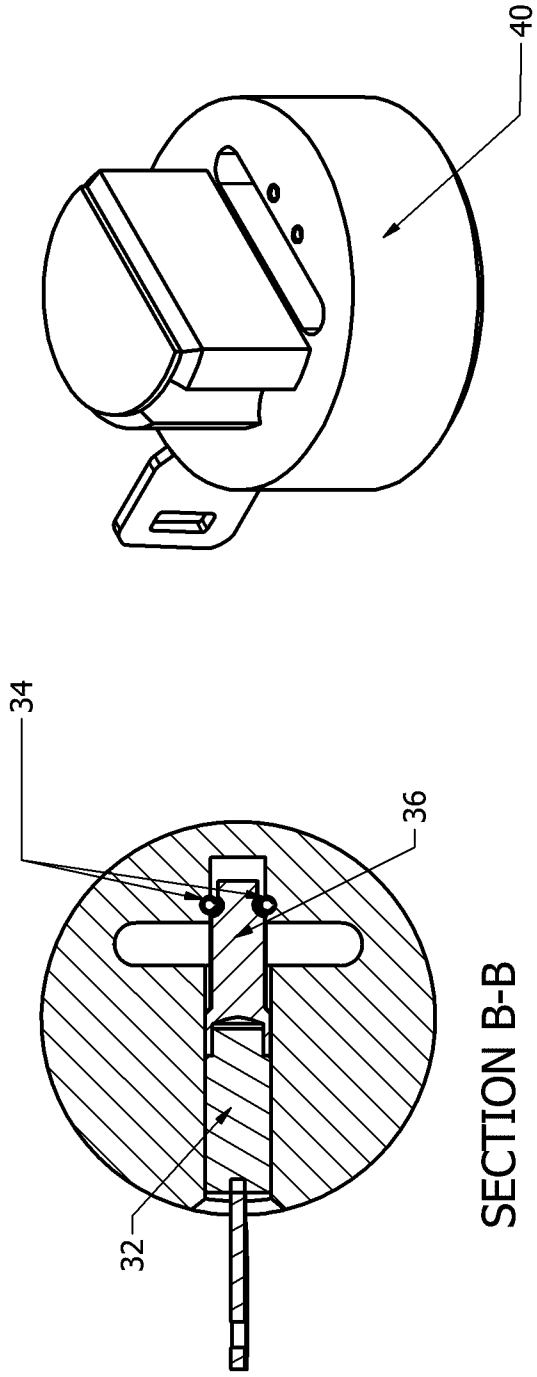


FIG 3
PIN BODY ASSEMBLY

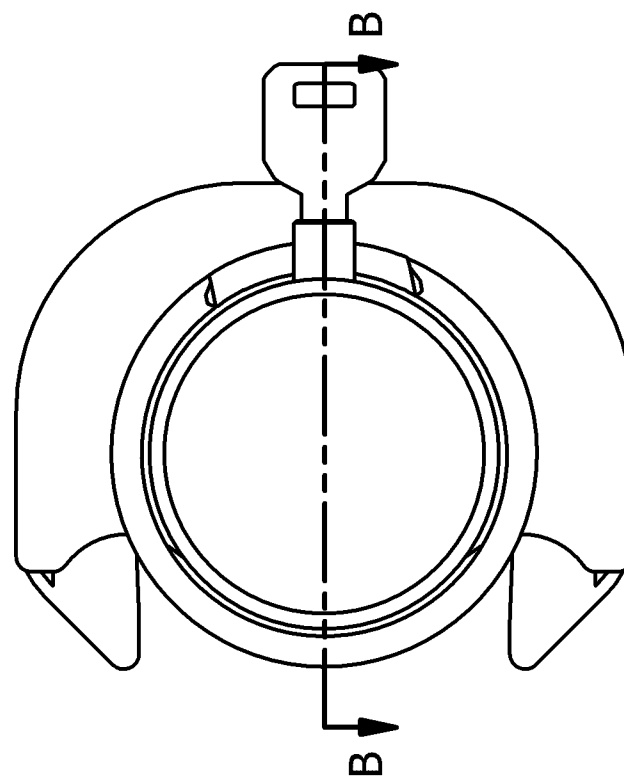
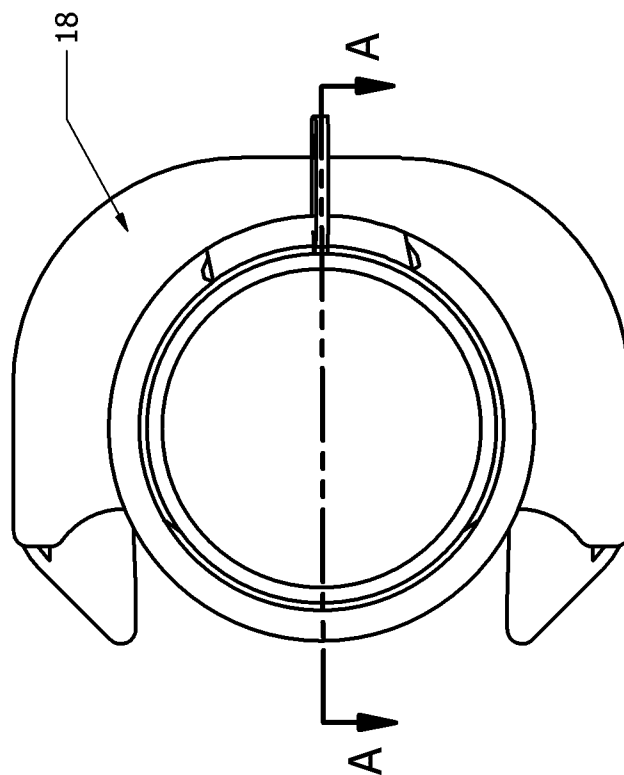
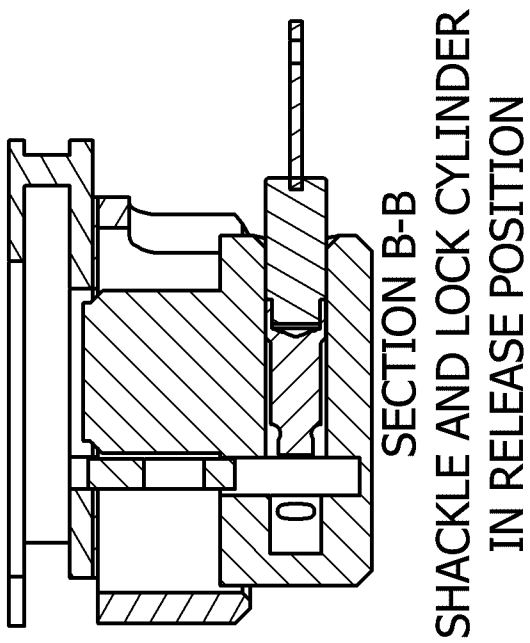
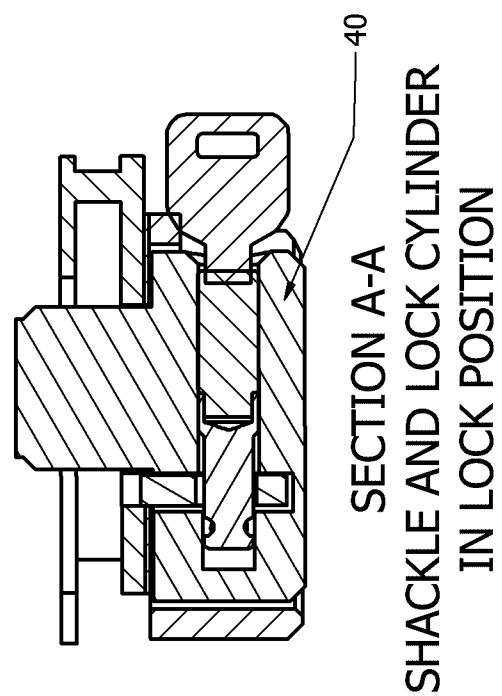
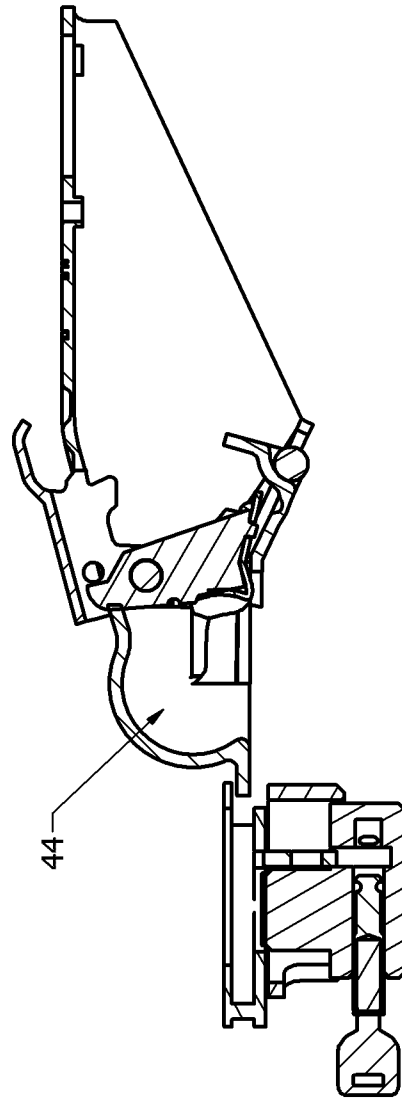
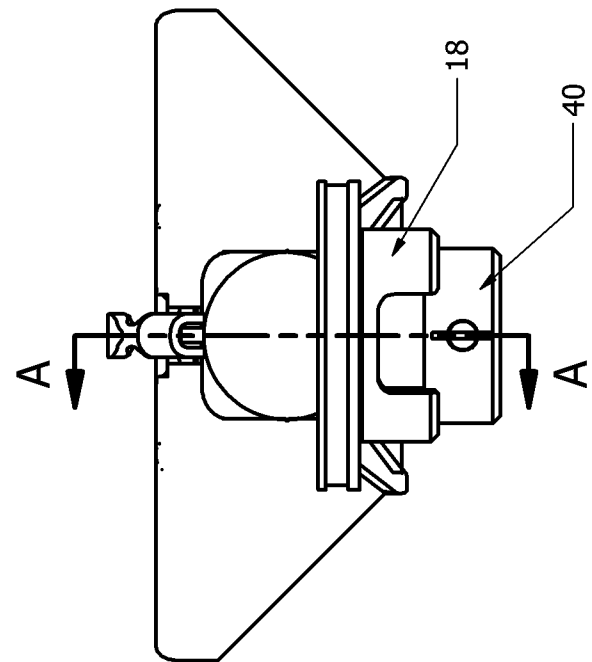
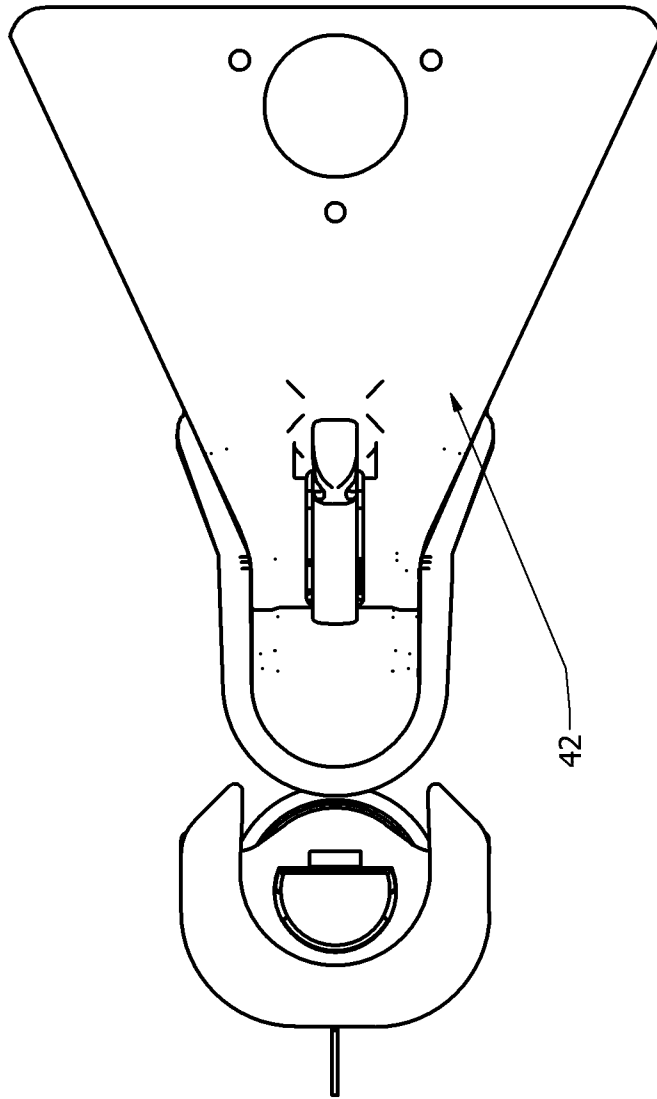


FIG 4
COMPLETE COUPLER LOCK ASSEMBLY



SECTION A-A

FIG 5
COMPLETE COUPLER LOCK
PREINSTALLATION

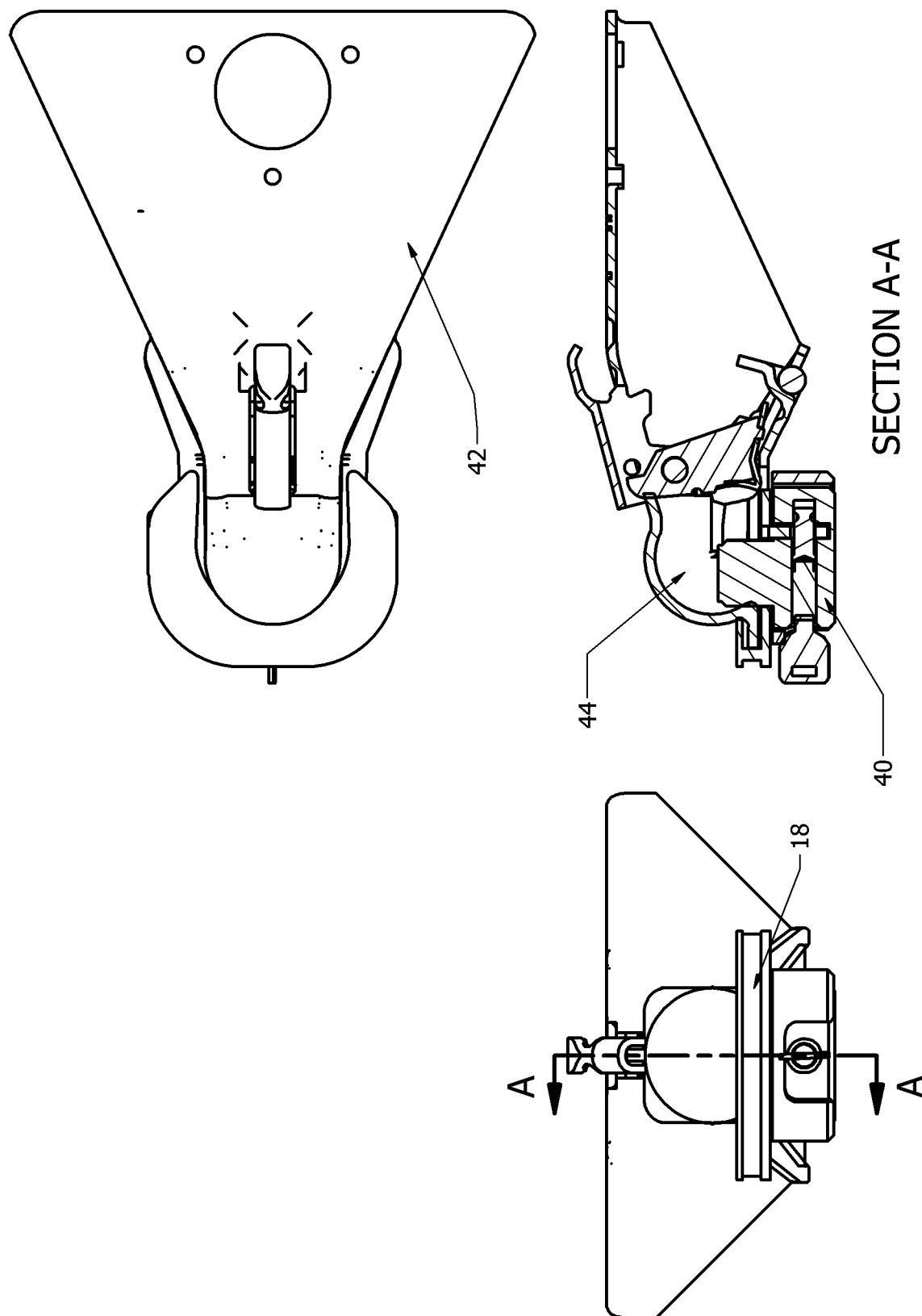
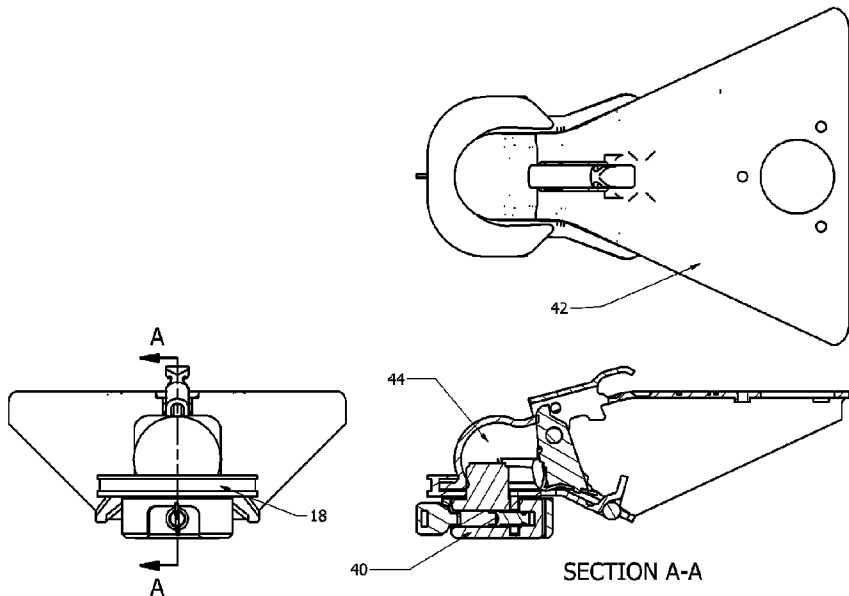


FIG. 6
COMPLETE COUPLER LOCK
ASSEMBLY INSTALLED AND IN LOCK POSITION



COMPLETE COUPLER LOCK
ASSEMBLY INSTALLED AND IN LOCK POSITION