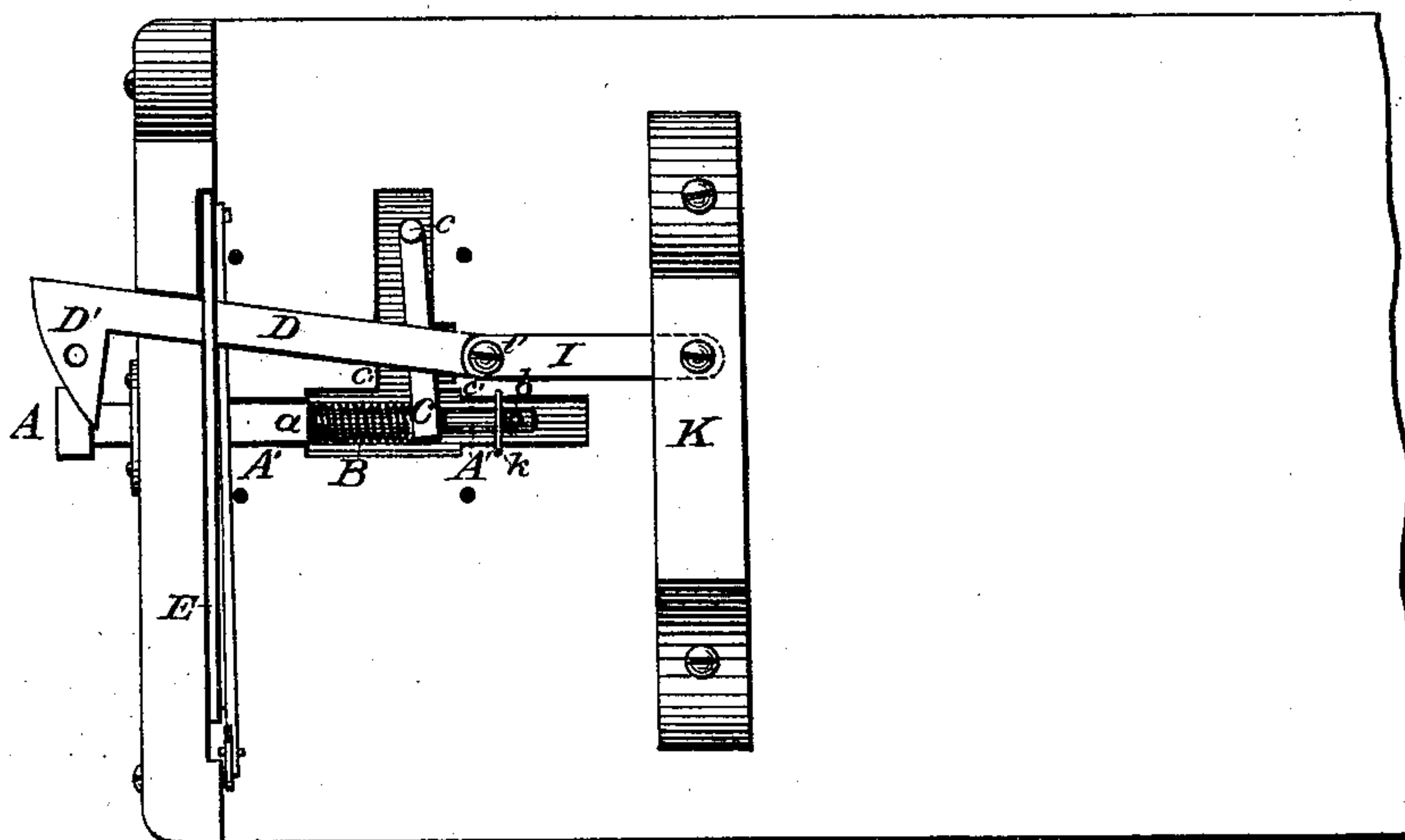
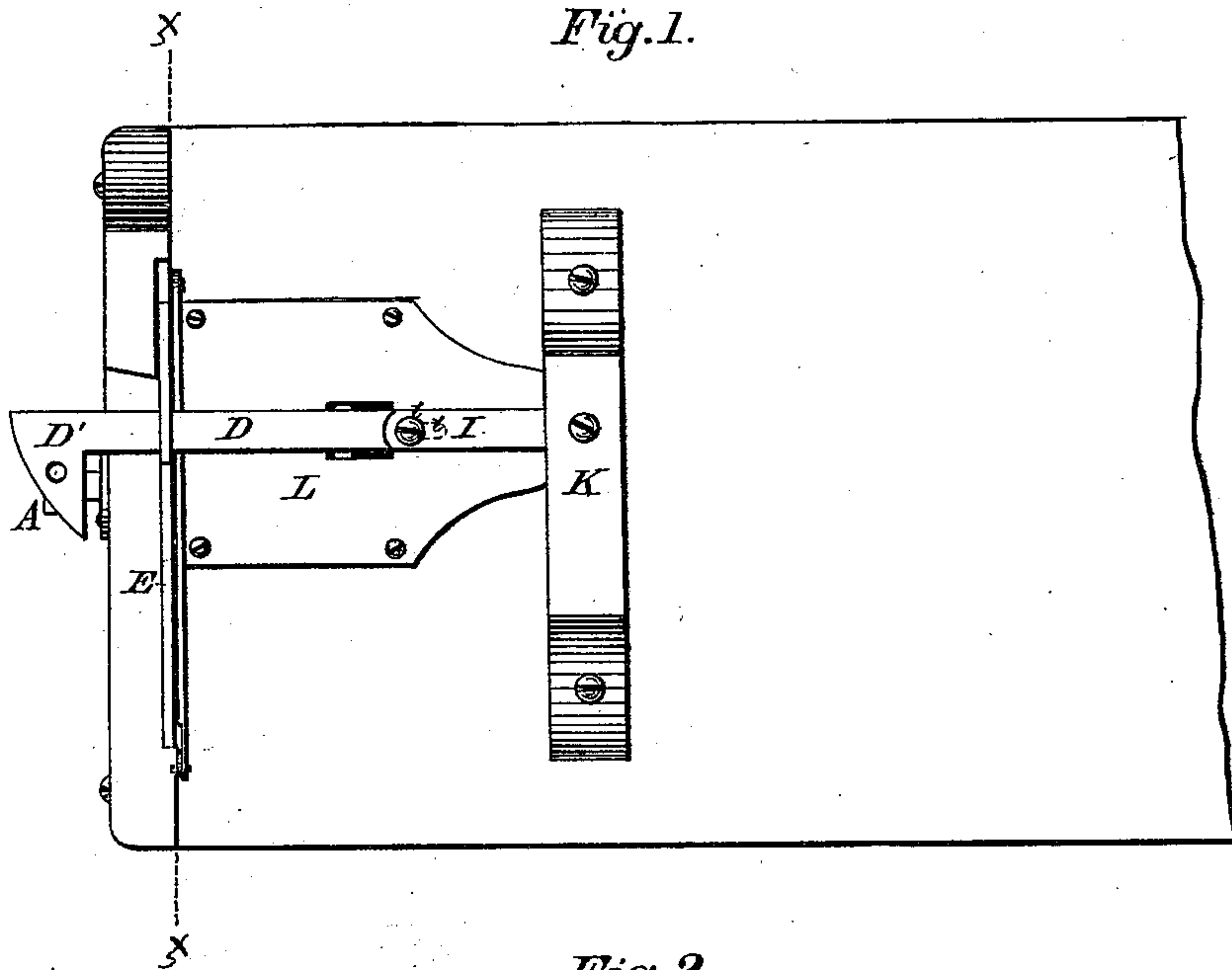


W. G. SMOOT.  
CAR-COUPLING.

No. 176,126.

Patented April 11, 1876.



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Inventor:  
William G. Smoot,  
by Louis Bagger  
his Atty.

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Fig. 3.

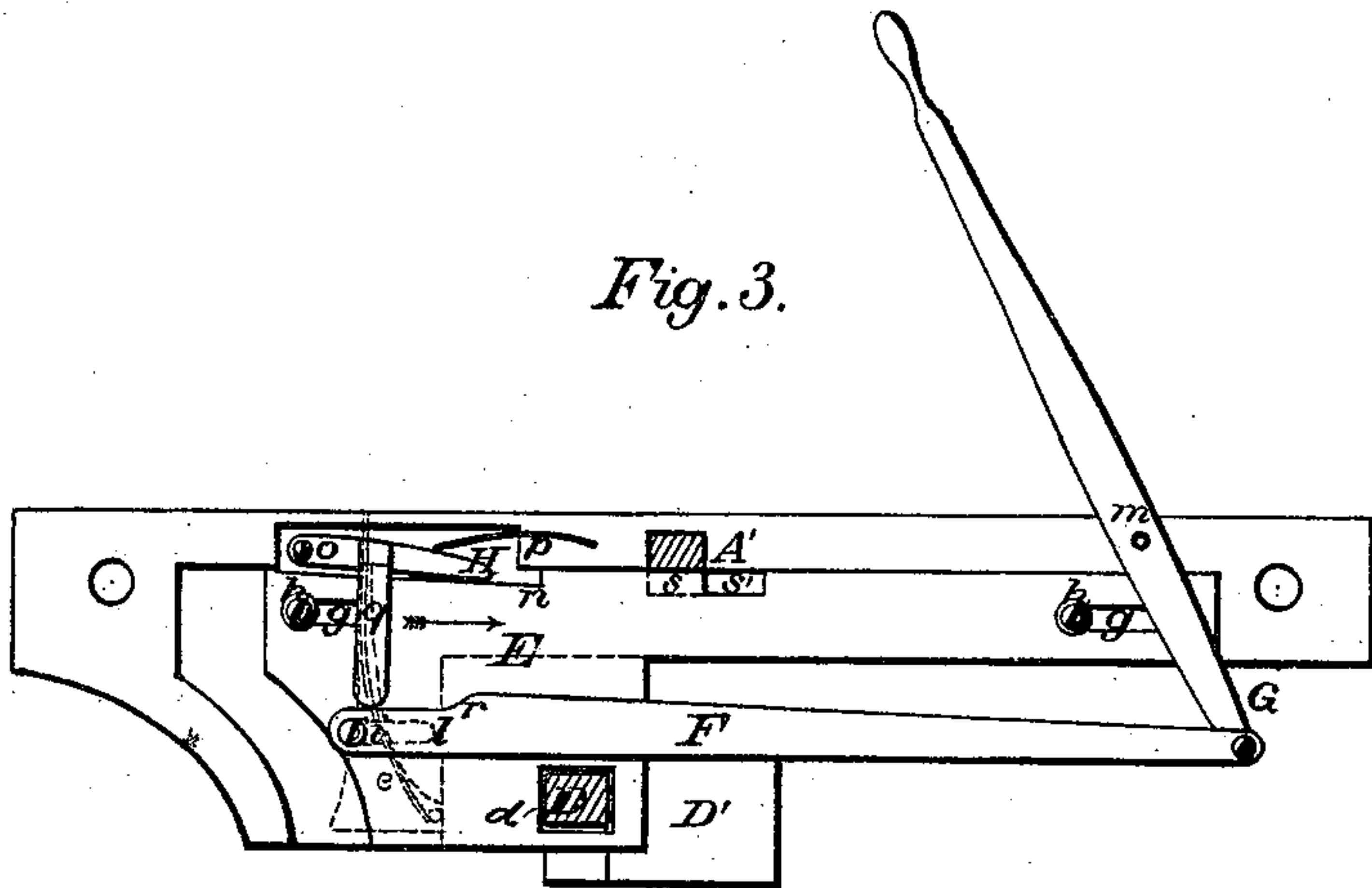


Fig. 4.

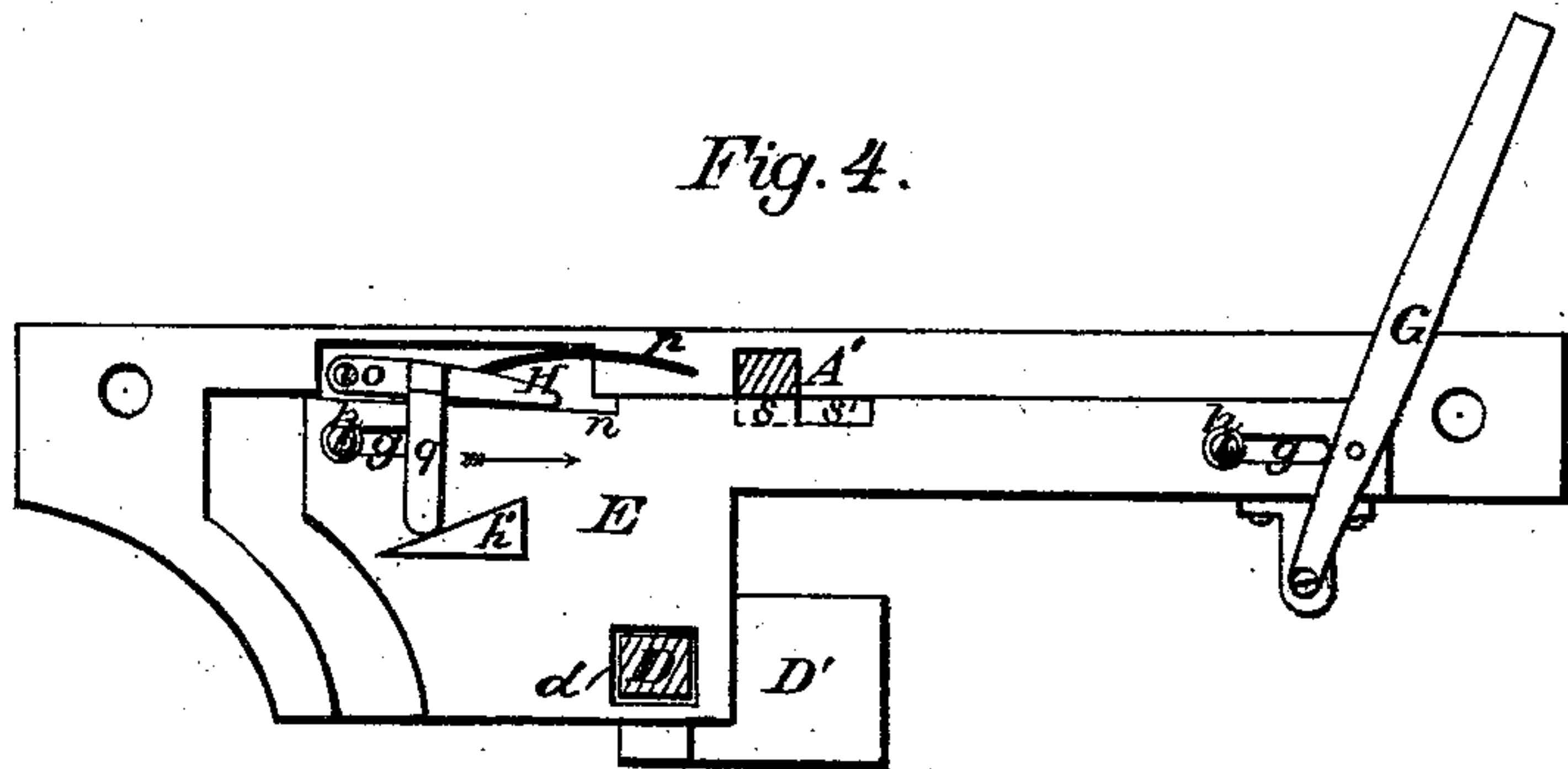
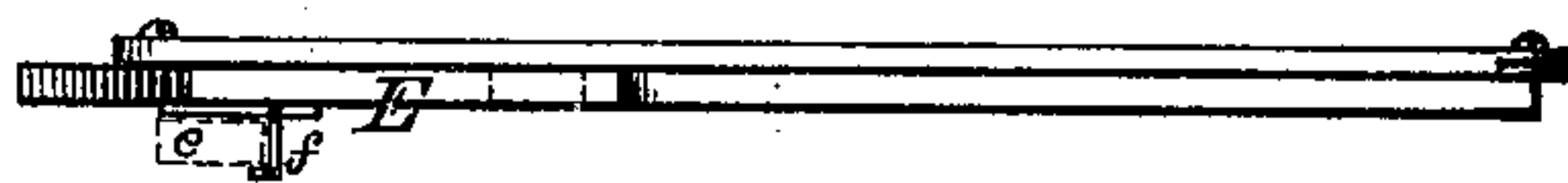


Fig. 5.



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# UNITED STATES PATENT OFFICE.

WILLIAM G. SMOOT, OF WASHINGTON, DISTRICT OF COLUMBIA.

## IMPROVEMENT IN CAR-COUPPLINGS.

Specification forming part of Letters Patent No. **176,126**, dated April 11, 1876; application filed February 16, 1876.

*To all whom it may concern :*

Be it known that I, WILLIAM G. SMOOT, of Washington, in the county of Washington and District of Columbia, have invented certain new and useful Improvements in Car-Couplings; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification, and in which—

Figure 1 is a bottom plan of a car having my improved coupling. Fig. 2 is a similar view, the covering-plate L having been removed. Fig. 3 is a vertical section through the plane indicated by the line *x x* in Fig. 1. Fig. 4 is a similar view, showing a modification in the construction of the operating parts; and Fig. 5 is a bottom plan of the lock-plate and locking-arm detached.

Similar letters of reference indicate corresponding parts in all the figures.

This invention, which relates to the so-called "automatic car couplings," consists in certain improvements upon the car-coupling described and shown in the Letters Patent, No. 172,667, granted to me on the 25th day of January, 1876; the said improvements having for their object to simplify the construction and produce a coupling that combines absolute safety and certainty of operation with a sufficient degree of elasticity to prevent any sudden shock or jerk when the cars are either started or stopped, or when a curve is turned.

The nature of said improvements I shall now proceed to describe more fully.

In the drawings hereto annexed, A represents the bumper or buffer, consisting of a head, A, and a stem or tongue, A'. B is a spring, coiled around or encircling the upper part of the stem A', and abutting, at one end, against a shoulder or offset, *a*, on the stem A', and at the other end against a lever-arm, C, having its fulcrum at *c*, and perforated, so as to admit of the passage through of the stem A'. *k* is a plate, secured vertically across the recess in which A' slides, and having a perforation for the passage of the buffer-stem, which is prevented from slipping out of the

perforation (by the pressure of the spring B) by a pin, *b*. The lever-arm C moves in a recess having shoulders *c' c'*, that control the motions, forward or back, of said lever, so that the spring B can only operate it to that extent, and no farther. Spring B may be constructed in any suitable manner, either of steel, rubber, or these materials combined. I prefer to use a coiled combination steel and rubber spring, as most durable and best adapted to the purpose; but an ordinary coiled steel spring, without the rubber, will answer the purpose very well. D is the draw-bar or coupling-stem, which has a hook, D', that, in coupling the cars, engages with a similar hook on the next car. The draw-bar D has an upward-projecting lip or shoulder, that catches under the lever-arm C in such a manner that when the bar D is impelled forward, in starting and pulling the cars, the lever C will press against spring B, the latter thereby giving elasticity to the draw-bar at starting, or while the train is in motion. In slacking up, spring B will gradually, as the strain upon it becomes less, expand, thereby obviating any sudden shock or jerk in stopping, previous to the buffers A of opposite cars coming in contact with each other.

It will also be observed that spring B gives elasticity to, or cushions, the buffer or bumper A; one single coiled spring thus answering the triple purpose of giving elasticity to the draw-bar in starting and pulling, taking up the slack in slacking up before stopping, and cushioning the buffer when a full stop is made and the cars are brought in contact with each other.

In the foregoing I have described the construction and operation of the buffer and draw-bar. I shall now proceed to describe the mechanism for effecting the coupling and uncoupling of the cars.

E is a plate, which slides in a vertical recess or slot in the front part of the platform of the car. This plate has an arm, *f*, projecting at right angles, which works against a stout spring, *e*, secured within the recess in which plate E slides. The tension of spring *e* will force plate E in the direction of the arrow, and, with plate E, also the draw-bar D, which passes through a slot or perforation, *d*, in plate E,



this being the position in which plate E and draw-bar D are when the cars are coupled. Plate E has two slots, *g g*, by means of which it slides upon the bolts *h h*; and *i* is a pin, to which an arm, F, is pivoted by means of a slot, *l*, as shown. Arm F is pivoted at its opposite end to a lever, G, which has its fulcrum at *m*, and passes up to the platform above, where it is operated.

When my improved coupling is used on freight-cars, arm F may be operated by rods or chains passing to the roof of the car, in a manner that will be readily understood.

It may sometimes be found convenient to dispense with the arm F, and operate plate E by a direct attachment of lever G, or its equivalent, to one end of said plate. This modified construction I have shown in Fig. 4.

Plate E has an offset, *n*, which, when the cars are coupled, abuts against a pawl, H, that is pivoted at *o* and operated by a spring, *p*. Pawl H has a downward-projecting arm, *g*, that reaches down to, and slides upon the upper edge of arm F, Fig. 3. Arm F has a beveled shoulder, (denoted by *r*;) which, when it, in uncoupling, is pushed back in the direction opposite to the arrow, will raise arm *g*, and, with it, pawl H, thereby lifting the point of said pawl up above the offset or shoulder *n*, so as to allow plate E to pass. When in the coupled position, pawl H abuts against the shoulder *n*, thereby preventing the withdrawal of plate E and keeping the coupling firmly locked.

When, as in Fig. 4, arm F is dispensed with, the pawl H is raised by a wedge shaped offset, *h'*, projecting from the side of plate E, the offset *h'* taking the place of the bevel *r* on arm F.

The operation of coupling or uncoupling is effected as follows: The buffer-stem A' has a slot at its under side, (denoted by *s*;) and the lock-plate E has a similar slot, (denoted by *s'*.) The buffer is retained in place by the upper edge of plate E catching into the slot *s* in the stem A'; but when plate E is slid sidewise by operating lever G, when it is desired to unlock the coupling, the slot *s'* will come directly under slot *s*, thus making room for the stem A' to pass, which will be forced outward by spring B.

When the buffer is pushed back by coming in contact with the buffer of the next car, the slot *s* will be again brought over the top edge of plate E, thus allowing it (impelled by spring *e*) to slip back to its locked position, and, as it carries with it the draw-bar D, the coupling is thereby effected.

It is obvious that the slot or recess *s* in the under side of the buffer-stem A' must be of sufficient depth to allow the top edge of plate E to slide under it, the object of this slot being to prevent the buffer from being forced outward by spring B until, in sliding plate E

sidewise, the slot *s'* has been reached, which admits of its passage, and also to allow plate E to slip back again into its locked position when the buffer A is pushed back.

The end of the draw-bar opposite to the coupling-hook is pivoted to a short link or bar, I, by means of a slot, *t*, and pin or bolt *t'*, sliding in said slot, so as to allow of longitudinal motion of the draw-bar D. The link I is pivoted securely in a cross-beam, K, bolted to the bottom of a car.

It will be observed that by this construction there will be no sudden pull upon the link I and cross-beam K, as the tension of the spring B has to be exhausted first before the end of the oblong slot *t* in draw-bar D will bear against bolt *t'*.

My improved car-coupling hereinbefore described is equally applicable to passenger and freight cars, and may be put onto any car with the greatest ease without necessitating expensive alterations of the platform.

The entire mechanism for operating the coupling may be inclosed in a cast-iron box, for excluding the dust, which box may then be bolted securely onto the under side of the platform; or the parts may be affixed separately in their position under the platform, in suitable recesses and bearings provided for the purpose, after which the whole is covered by a plate, L, as shown in the drawing.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. The combination of the buffer A A', spring B, lever-arm C, and draw-bar D, substantially as and for the purpose hereinbefore set forth.

2. The sliding lock-plate E, having perforations *d g g*, projecting arm or bracket *f*, offset *n*, and slot or recess *s'*, constructed and arranged to operate substantially in the manner and for the purpose hereinbefore set forth.

3. The combination of the lock-plate E, spring *e*, pawl H, and spring *p*, all constructed and arranged to operate substantially in the manner and for the purpose hereinbefore set forth.

4. The combination of the buffer A A', having slot or recess *s*, spring B, lever-arm C, and lock-plate E, all constructed and operating substantially in the manner and for the purpose hereinbefore set forth.

5. The combination of the lever G, arm F, having beveled shoulder *r*, and spring-pawl H, having arm *g*, all constructed and arranged for operation substantially in the manner and for the purpose hereinbefore set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

WILLIAM G. SMOOT.

Witnesses:

LOUIS BAGGER,  
WM. BAGGER.