2 Sheets—Sheet 1.

C. J. A. DICK & T. L. LUDERS.

Device for Retarding the Recoil of Springs.

No. 207,020. **Patented Aug. 13, 1878.**

FIG. 1.

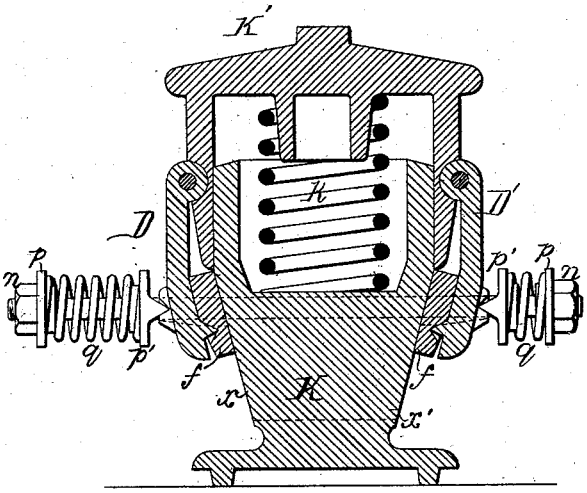


FIG. 2.

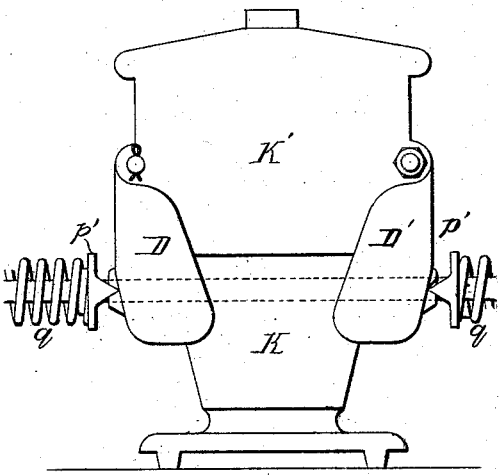


FIG. 3.

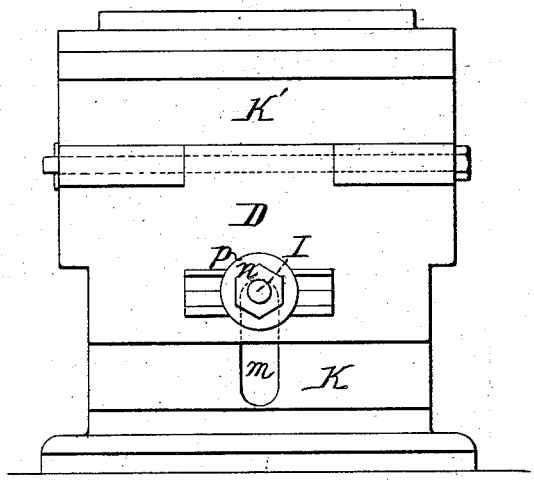
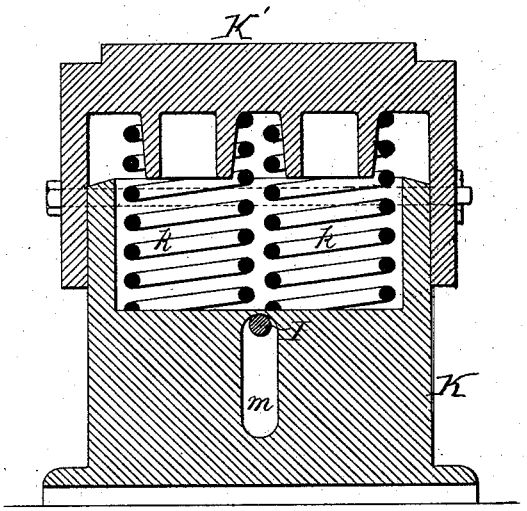


FIG. 4.



Witnesses.
Harry A. Crawford
Harry Smith

Inventors
Charles J. A. Dick
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by their Attorneys
Howson & Sutton

2 Sheets—Sheet 2.

C. J. A. DICK & T. L. LUDERS.

Device for Retarding the Recoil of Springs.

No. 207,020. **Patented Aug. 13, 1878.**

FIG. 5.

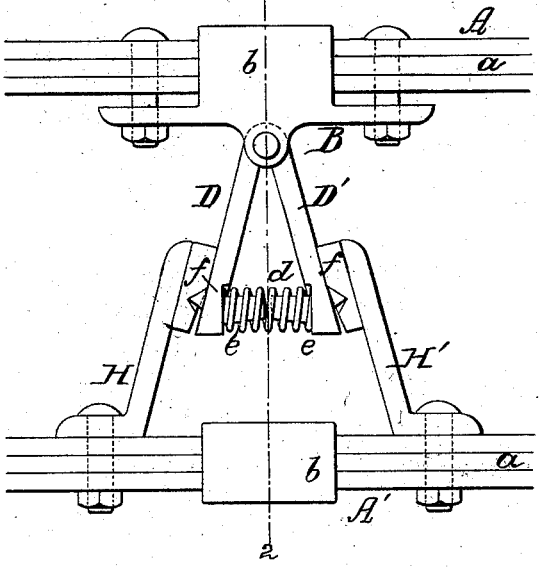


FIG. 6.

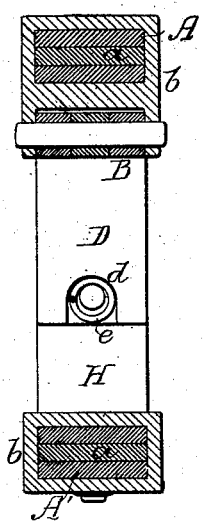


FIG. 7.

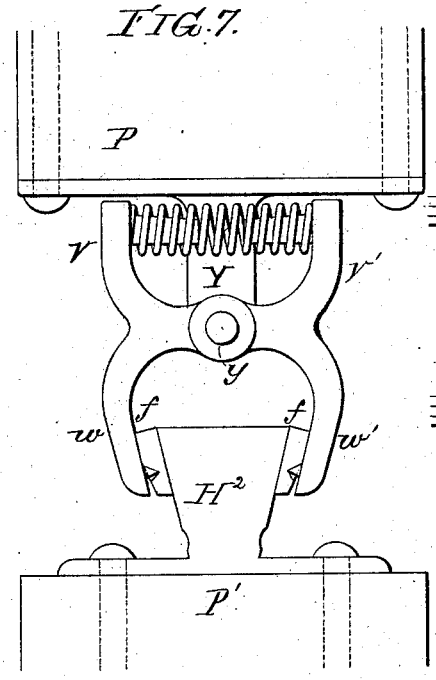
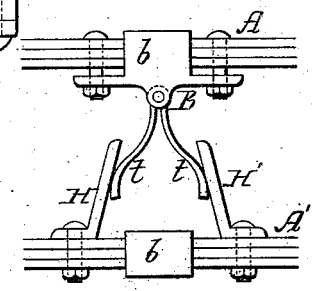


FIG. 8.



Witnesses,
Harry A. Crawford
Harry Smith

Inventors,
Charles J. A. Dick
and Thomas L. Luders
by their Attorneys
Howson and Son

UNITED STATES PATENT OFFICE.

CHARLES J. A. DICK AND THOMAS L. LUDERS, OF PHILADELPHIA, PA.

IMPROVEMENT IN DEVICES FOR RETARDING THE RECOIL OF SPRINGS.

Specification forming part of Letters Patent No. **207,020**, dated August 13, 1878; application filed June 12, 1878.

To all whom it may concern:

Be it known that we, CHARLES J. A. DICK and THOMAS L. LUDERS, both of Philadelphia, Pennsylvania, have invented a new and useful Improvement in Devices for Retarding the Recoil of Bearing-Springs, of which the following is a specification:

The object of our invention is to prevent the sudden and disagreeable shocks due to the abrupt recoil of springs of railroad-cars and other vehicles, and this object we attain by combining with a spring, either directly or indirectly, devices, substantially as described hereinafter, for retarding the recoil of a spring by friction, which does not materially interfere with the proper yielding of the spring under pressure.

The application of our invention to box-springs for railroad-cars is illustrated in Sheet 1 of the accompanying drawing, in which—

Figure 1 is a vertical section; Fig. 2, an end view; Fig. 3, a side view; and Fig. 4, a transverse vertical section.

K is the lower portion, and K′ the upper portion or cover, of the box, the latter being arranged to fit snugly but slide freely on the former, which has opposite inclined sides *x x′*. The elastic medium between the two parts of the box consists, in the present instance, of two ordinary spiral springs, *k k*.

To the cover K′ of the box are hinged the two plates D D′, one on each side, and between each plate and the adjacent inclined side of the lower portion of the box intervenes a friction-shoe, *f*, pivoted to the plate by a V-shaped projection on the latter adapted to a V-shaped recess in the shoe.

A bolt, I, passes through the plates D D′ and friction-shoes *f f*, and through a vertically-elongated opening, *m*, in the lower portion of the box, this bolt having on each end a washer, *p*, and nut *n*, between which and a washer, *p′*, intervenes a spiral spring, *q*, the washer *p′* having V-shaped projections fitting into a similarly-shaped recess in the plate D. These springs tend to press the shoes *f* against the opposite inclined sides *x x′* of the box with a force depending upon the adjustment of the nuts *n*.

The upper portion of the box will yield as freely, or almost as freely, as in the absence of the friction-shoes, for the latter slide downward in contact with the converging surfaces *x x′*; but the recoil of the upper portion of the box will be resisted by the friction of the shoes in their ascent against diverging surfaces, and hence the recoil will be retarded to an extent proportionate to the amount of friction, which may be increased or diminished by the adjustment of the nuts *n n*.

Figs. 5 and 6 illustrate the application of our invention to an ordinary double elliptical spring, Fig. 6 being a vertical section on the line 1 2, Fig. 5.

In these views, A A′ represent the central portions of two parts of an elliptical spring, each composed of leaves *a* of steel, (three leaves in the present instance,) and bound together, as usual, in the middle by a strap, *b*.

To an attachment, B, secured to the under side of the upper part, A, of the spring, are hinged, independently of each other, the two inclined plates D D′, between which, near their lower ends, intervenes a spiral spring, *d*, surrounding the two projections *e e*, one on the inner side of each plate, the said spring tending to force the plates apart from each other, and the projections *e e* serving to limit the movement of the legs toward each other and to retain the spring in place.

To the lower portion, A′, of the spring are secured the two inclined plates H H¹, and against the inner face of each plate bears a friction-shoe, *f*, one of which is pivoted to the plate D and the other to the plate D′.

Different modes of pivoting these shoes, and those described above, to the plates may be adopted, but we prefer to make an angular or V-shaped recess in each shoe *f* for receiving an angular rib on the adjoining plate, the angle presented by the rib being more acute than that presented by the sides of the recess in the shoe, and the latter being so formed that the parallelism of the shoe with the inner face of the adjoining plate will always be assured as the hinged plates D D′ are moved from or toward each other.

The angular projections may be on the shoes, and the recesses in the hinged plates.

The friction of the shoes against the inclined plates H H¹ will not materially obstruct the yielding of the spring under pressure, the

shoes sliding freely in their descent against the diverging surfaces of the plates. When the spring is relieved from pressure, however, the recoil will be retarded by the friction of the shoes against the converging surfaces.

It is not essential in all cases to combine the device for counteracting the abrupt recoil of a spring directly with the latter, as there are instances in which it may be conveniently arranged separately from but so as to co-operate with a spring. In Fig. 7, for instance, P′ is the bolster-beam, and P the bolster, of a railroad-car, the latter being supported by any suitable springs.

A block, H^2, with inclined sides, is secured to the beam P′, and this block is embraced by and between the friction-shoes *f f*, pivoted to and forming part of jaws consisting of the two arms *w w′*, pivoted by a pin, *y*, to a hanger, Y, secured to the under side of the bolster P.

On the arms *w w′*, and forming part of the same, are arms *v v′*, and between the two arms *v v′* is interposed a spiral spring, *d*, tending to force the said arms outward and the arms *w w′* inward, and to force the friction-shoes against the inclined sides of the block H^2. The recoil of the springs which support the beam P′ will be counteracted by the friction of the shoes against the block to a sufficient extent to prevent undue shocks.

Where a single elliptical spring is used, as is often the case in many vehicles, the plates H H^1, Fig. 5, may be secured to any fixed object above or below the spring—to the carriage-body, for instance, or to the axle.

In the modification shown in Fig. 8 the shoes *f* and rigid arms are dispensed with, two elastic arms, *t t*, bearing directly against inclined surfaces, in a manner which will be readily understood without explanation.

It is not essential in carrying out our invention to adhere exactly to the devices shown, as other arrangements of parts, depending mainly on the kind of spring with which the retarding device has to be combined, will readily suggest themselves.

We claim as our invention—

The combination, with a bearing-spring, of a device for retarding its recoil, the said device consisting of two main elements—namely, inclined surfaces, and plates or jaws caused to bear against the said surfaces, substantially in the manner described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

C. J. A. DICK.
THOS. L. LUDERS.

Witnesses:
HARRY A. CRAWFORD,
HARRY SMITH.