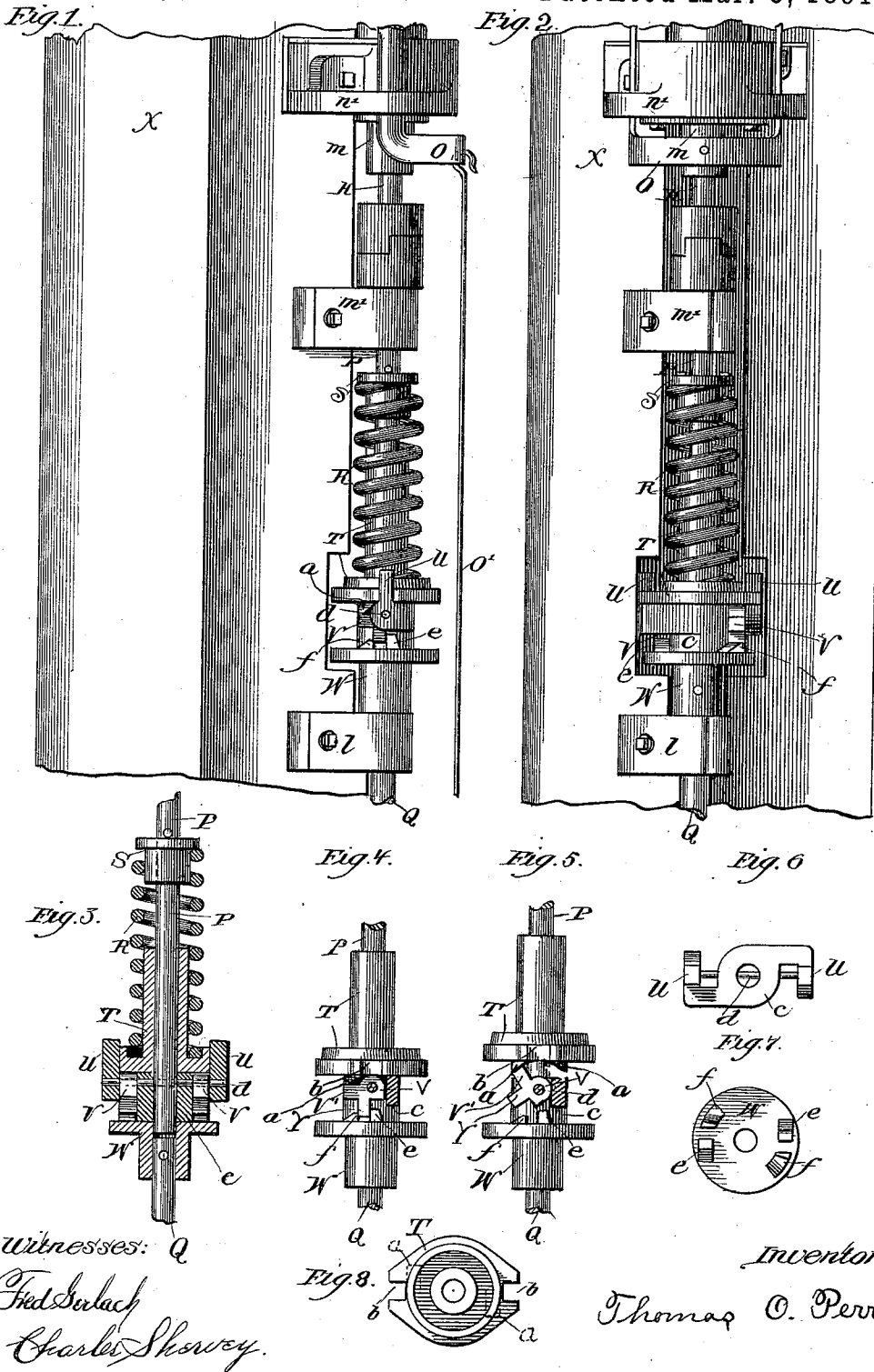


(No Model.)

T. O. PERRY.
SAFETY COUPLING.

No. 447,413.

Patented Mar. 3, 1891.



UNITED STATES PATENT OFFICE.

THOMAS O. PERRY, OF CHICAGO, ILLINOIS.

SAFETY-COUPLING.

SPECIFICATION forming part of Letters Patent No. 447,413, dated March 3, 1891.

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To all whom it may concern:

Be it known that I, THOMAS O. PERRY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Safety-Coupling, of which the following is a specification.

My invention relates more especially to improvements in safety-couplings which connect two pieces of shafting meeting end to end, so that one piece drives the other; and the objects of my improvements are, first, to so couple the driven shaft with the driving-shaft that an accidental excessive strain on the driven shaft will completely release without injury the driving-connection between the two shafts, and, second, to make it easy to quickly re-establish the driving-connection. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side view of the safety-coupling connecting two pieces of vertical shafting as applied to the windmill and supported by a vertical mast. Fig. 2 is a front elevation of the same parts as shown in Fig. 1. Fig. 3 is a sectional elevation of the safety-coupling, taken in a plane containing the vertical axis of the shafts and the pivoted axis of the safety-latches. Fig. 4 is a side elevation of portions of the safety-coupling, showing one of the safety-latches in driving position. Fig. 5 is a side elevation of the same parts as shown in Fig. 4, but showing one of the safety-latches turned out of its driving position. Fig. 6 is a plan of the safety-latch carrier. Fig. 7 is a plan of the driven clutch. Fig. 8 is a plan of the safety-latch presser.

Similar letters refer to similar parts throughout the several views.

The safety-coupling is constructed as follows: Two latches V are pivoted on opposite sides of a latch-carrier C, keyed to the vertical shaft P. The latches V are each provided with two projections, one Y below the pivot and one V' in the rear of the pivot. The lower latch projections Y engage with a driven shoulder e on the driven clutch W, which is keyed to the upper end of a section Q of vertical shafting immediately below the section P. The end of shaft P loosely enters the

driven clutch W a short distance for convenience in holding the adjoining ends of the two sections of shafting concentric with each other. To hold the latches V in driving position against the driven shoulders e, as shown in Figs. 1 and 4, their rear projections V' are pressed upon by pressure-spurs a, projecting down from the under side of the flange T, which is also provided with notches b, which set loosely over vertical guides u, projecting up from the latch-carrier C, so that the flange T revolves with the latch-carrier C and at the same time is allowed to have a small vertical movement. The flange T loosely surrounds the vertical shaft P, rests upon the latch-carrier C while in working position, and is held from tipping by the length of its bearing on the shaft. If the flange T were made sufficiently heavy, its weight would hold the latches V in working position against the shoulders e of the driven clutch W. If the driving strain becomes too great, the latches V will raise the flange T, turn about their pivots sufficiently to pass over and release themselves from the driven shoulders e, and so cease to drive the lower section of shafting Q; but before the latches V turn sufficiently to allow the lower projections Y to pass over the driven shoulders e the projections V' will be turned so that their rear ends, instead of their topsides, will be pressed against by the pressure-spurs a, and from this position (shown in Fig. 5) the latches will not snap back to working position, as the pressure of the spurs a is exerted on the latches in a radial direction instead of at right angles to radii, as is the case when the latches are in working position. Hence when the latches V are once thrown out of working position through accidental overstraining of the shaft Q, the shafts P and Q will remain disconnected and the shaft P can continue to revolve without disturbing the repose of shaft Q. By raising the flange T the latches V are allowed to drop back into the position shown in Figs. 1 and 4, ready again for work.

The upper surface of the rear projection V' is shown in Figs. 1, and 4 at about the same height as the pivoted axis of the latch, and the pressure-spur a on the under side of flange T reaches down to meet this surface;

but the pressure-spur *a* is not a necessity, as the plain under surface of the flange *T*, or even the spring *R* itself, could be made to rest directly upon the upper surface of rear projection *V'* by simply raising projection *V'* sufficiently above the pivoted axis of the latch. This would also dispense with the need of the notches *b* and guides *u*; but the construction shown is preferred in order to make a less variable resistance to the turning of the latch and to avoid turning the latch through a greater angle than the construction shown requires.

As the flange *T* would be cumbersome if made sufficiently heavy to retain the latches *V* against great working strain, it is held down by a compressed spring *R*, which can be further compressed sufficiently to allow the latches *V* to disengage themselves from the shoulders *e*. The spring *R* surrounds the shaft *P* and is compressed between the flange *T* and a support *S* secured to the shaft *P*. The latch *Y* can turn about its pivot from working position only in one direction, as required for disengagement, as already described. It is prevented from turning in the opposite direction by the contact of its front side with the latch-carrier *C*.

To prevent backlash between the two shafts *P* and *Q*, a low knob *f* on the driven clutch *W* engages the back side of the lower projection *Y*, which is thereby held in tolerably close proximity to the driven shoulder *e*, though not so close as to prevent the latch turning on its pivot. The knob *f* has a sloping back and is low enough so that the projection *Y* can be readily forced over it when moving toward the driven shoulder *e* in case the projection *Y* should by chance get behind the knob while replacing the latch in working position. In passing over the knob *f* from behind the shaft *P* is raised a little in its bearings.

The amount of torsional strain that may be applied to the shaft *Q* is determined by the tension given to the compressed spring *R*, and this spring should be of such length, strength, and degree of compression that the safety-latches will let loose whenever the shaft is strained beyond what it can safely bear.

It will be understood that this safety-coupling is operative with only one latch *V*, though by using two latches the strain is less and the coupling is better balanced.

The shafting *PQ* is supported by boxes *m'* and *l*, secured to an upright timber or mast *X*. The box *m* and shaft *H* belong to the lower part of a wind-motor, as here represented, which is also secured to the mast *X*, and the motor-shaft *H* is coupled to the shaft *P*. I do not, however, confine the use of this safety-coupling to wind-motors, nor to vertical shafting, as it can be used with any kind of motor and with horizontal shafting as well; nor is the use of this device necessarily limited to revolving shafts, as the same principle can be applied where one axially-recip-

rocating shaft is required to drive another, as in the operation of common reciprocating pumps.

What I claim, and desire to secure by Letters Patent, is—

1. In combination with a driving-shaft and a driven shaft meeting end to end, a safety-latch pivoted to the driving-shaft, a driven clutch secured to the driven shaft and driven by said safety-latch, a compressed spring resting against a support secured to said driving-shaft, and a suitably-guided sliding flange pressed upon by said spring and adapted to retain the said safety-latch in working position, said flange having a shoulder adapted to secure said safety-latch against snapping back after it has once been turned out of its working position by excessive strain, substantially as herein set forth.

2. In combination with a driving-shaft and a driven shaft meeting end to end, two safety-latches pivoted to the driving-shaft on opposite sides thereof, a driven clutch with opposite shoulders secured to the driven shaft and driven by said safety-latches, a compressed spring resting against a support secured to said driving-shaft, and a suitably-guided sliding flange pressed upon by said spring and adapted to retain said safety-latches in working position, said flange having shoulders adapted to secure said safety-latches against snapping back after they have once been turned out of their working position by excess of strain, substantially as herein set forth.

3. In combination, a driven shaft having a driven shoulder, a driving-shaft, a movable flange suitably guided, a spring adapted to press against said flange, and a driving-latch pivoted on said driving-shaft and having back of its pivotal axis a projection pressed against by said flange to hold said latch in driving position, said projection being also adapted to receive the thrust of said flange, so as to hold said latch from snapping back after once being turned out of its driving position, substantially as herein set forth.

4. The pivoted safety-latches *V*, having projections *Y* and *V'* carried by a latch-carrier *C*, keyed to the driving-shaft *P*, in combination with a driven clutch *W*, keyed to the driven shaft *Q* and having shoulders *e*, a sliding flange *T*, a spring *R*, compressed between said sliding flange and a support *S*, secured to said driving-shaft, the flange *T* being pressed by said spring against the projections *V'*, so as to hold the projections *Y* in driving position against the shoulders *e*, the said flange being also adapted to hold the said safety-latches from snapping back after once being turned out of their working position by excessive strain, substantially as herein shown and described.

5. In combination, a driven shaft having a driven shoulder, a driving-shaft, a driving-latch pivoted on said driving-shaft and having back of its pivotal axis a projection, and a

spring adapted to press against said projection to hold said latch in driving position against said driven shoulder, said projection being also adapted to receive the thrust of
5 said spring, so as to hold said latch from snapping back after once being turned out of driving position, substantially as herein set forth.

6. In combination with a driving-shaft P
10 and a driven shaft Q, a pivoted safety-latch V, having projections Y and V', a latch-carrier C, secured to said driving-shaft and having guide *u*, a sliding flange T, having spur *a* and notch *b*, a clutch W, secured to said
15 driven shaft and having shoulder *e*, a spring R, and a spring-support S, secured to said

driving-shaft, substantially as herein shown and described.

7. In combination with a driving-shaft P and a driven shaft Q, the pivoted safety-latch 20 V, having projections Y and V', the latch-carrier C, keyed to said driving-shaft and having guide *u*, the sliding flange T, having notch *b*, the spring-support S, secured to said driving-shaft, the spring R, and the driven 25 clutch W, keyed to said driven shaft and having shoulder *e* and knob *f*, substantially as herein shown and described.

THOMAS O. PERRY.

Witnesses:

M. M. GIFFEN,
F. E. SMITH.