(No Model.)

J. B. STONE.

COMBINED SPRING SHACKLE AND OIL EJECTOR.

No. 593,788. Patented Nov. 16, 1897.

Fig. 1.

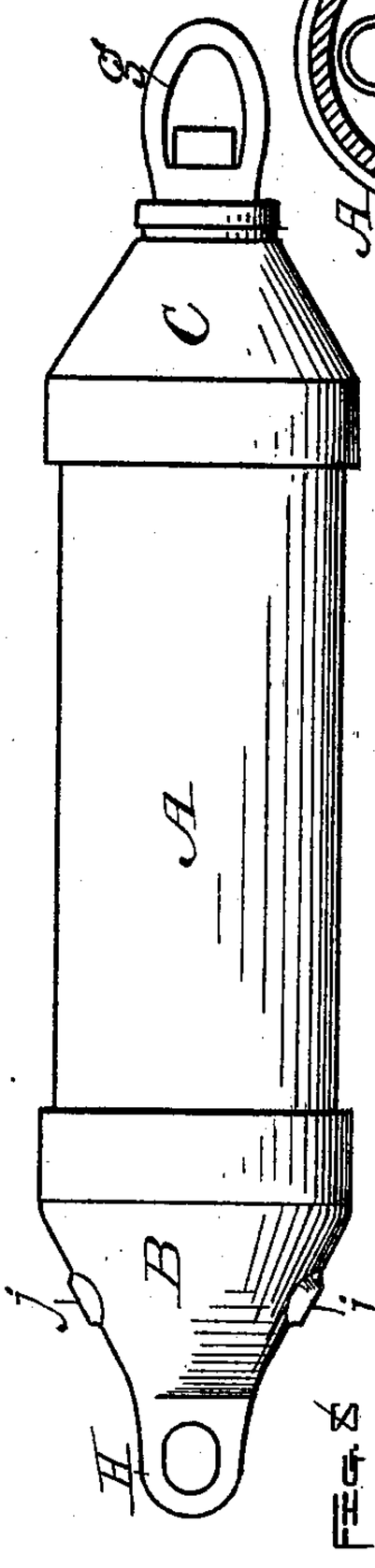

Fig. 2.

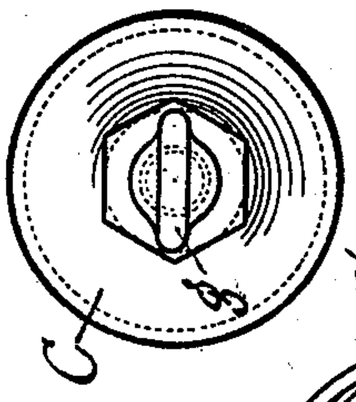

Fig. 3.

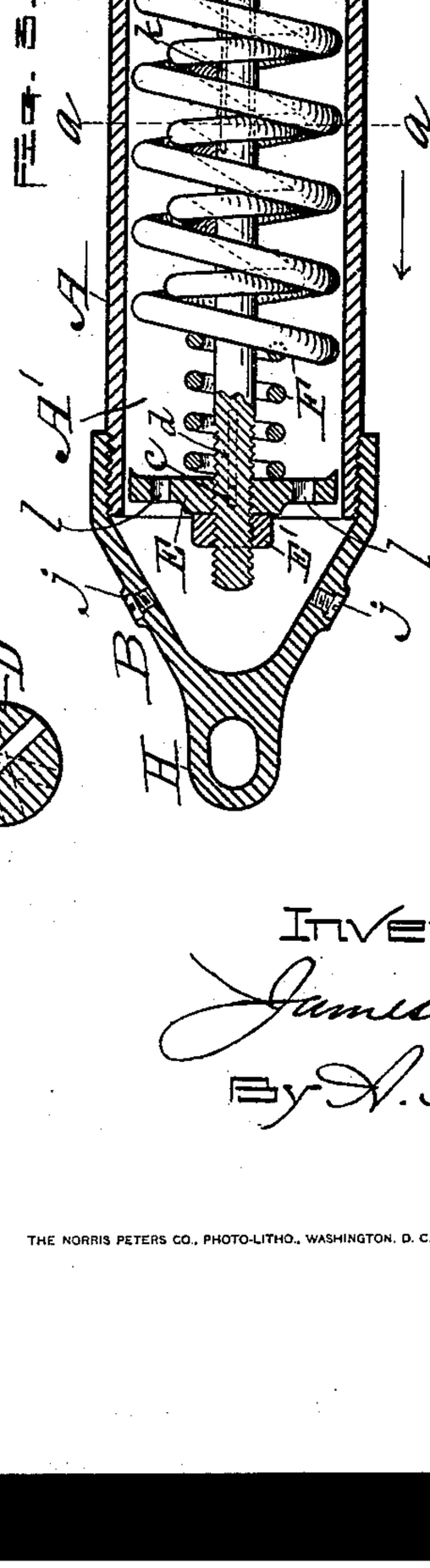

Fig. 4.

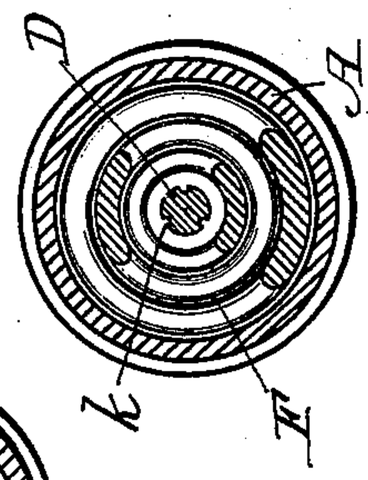

Fig. 5.

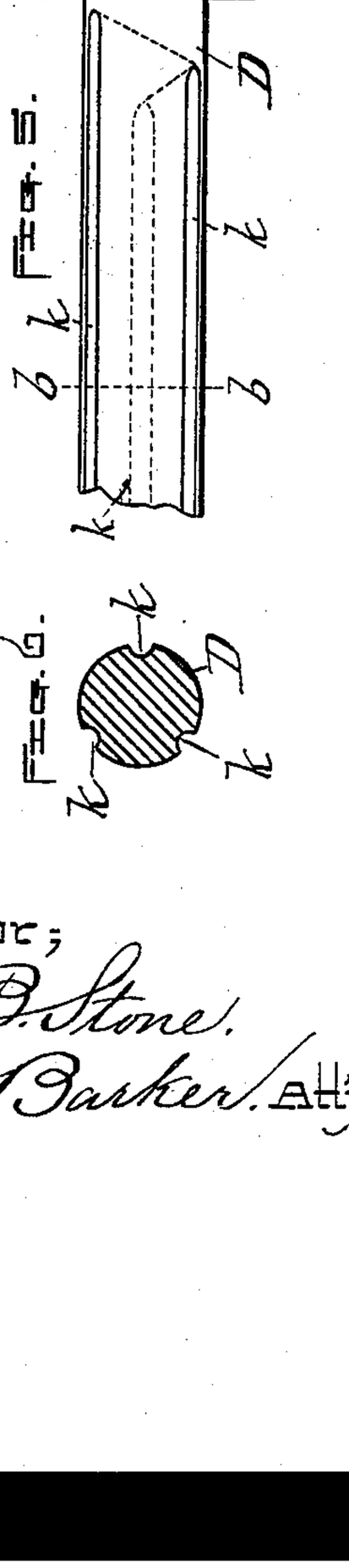

Fig. 6.

Fig. 7.

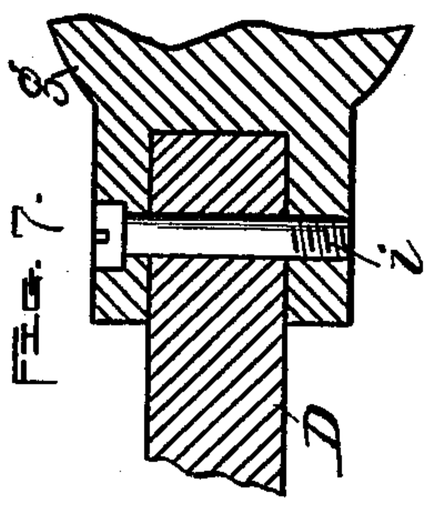

Fig. 8.

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By A. A. Parker. Atty.

UNITED STATES PATENT OFFICE.

JAMES B. STONE, OF WORCESTER, MASSACHUSETTS.

COMBINED SPRING-SHACKLE AND OIL-EJECTOR.

SPECIFICATION forming part of Letters Patent No. 593,788, dated November 16, 1897.

Application filed April 5, 1897. Serial No. 630,733. (No model.)

To all whom it may concern:

Be it known that I, JAMES B. STONE, of the city and county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in a Combined Spring-Shackle and Oil-Ejector for Attachment to Anchor-Cables and Towing-Hawsers of Vessels; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 represents a side view of my said improved combined spring-shackle and oil-ejector. Fig. 2 is an end view thereof. Fig. 3 is a central longitudinal section, partly in side view, through the spring-shackle and oil-ejector. Fig. 4 is a transverse section therethrough, taken at the point indicated by line *a a* in Fig. 3. Fig. 5 is an enlarged view showing a central longitudinal section, partly in side view, of a part of the device shown at the right-hand end of Fig. 3, showing also a modification in the construction hereinafter described. Fig. 6 is a transverse section of the central longitudinal spindle of the device, taken on line *b b*, Fig. 5; and Figs. 7, 8, and 9 show other modifications in the construction, which will also be hereinafter described.

The object of my invention is to provide a combined spring-shackle and oil-ejector adapted to be attached to the anchor-cable or towing-hawser of a vessel to relieve said cable or hawser from excessive or sudden strain and thereby preventing breakage, and also to cause oil to be discharged and distributed upon the surface of the water in a heavy sea, as in a storm, while the vessel is anchored or being towed, said discharge of oil being caused by the draft upon the cable or hawser to which the vessel is attached while thus anchored or towed, the degree of strain governing the amount of oil discharged according to the severity of the storm, as will be hereinafter more fully set forth.

In order that others skilled in the art to which my invention appertains may better understand the nature and purpose thereof, I will now proceed to describe it more in detail.

In the drawings, A represents a tight cylinder or shell threaded externally for a short distance at each end and having the hollow conical-shaped caps or heads B C screwed onto said threaded ends, the latter being provided with internal threads corresponding to and adapted to fit said external threads on the cylinder. The chamber A′, formed by thus uniting said cylinder and caps or heads, is designed to contain the oil for ejection and distribution and also the mechanism for effecting said ejection when any tensional strain is imparted thereto. Said mechanism consists of the central longitudinal rod or spindle D, the head E, secured at its inner end, and a series of spiral springs F, three in this instance, arranged over said rod or spindle between said head E and the cap or head C, the latter being provided with steps or shoulders C′ upon its inner side for the ends of said springs to bear against. The springs are of different diameters and arranged one within another to obtain the necessary resistance to the draft upon the cable or hawser to which the device is attached, said resisting power being increased or decreased by the size and number of said springs employed and also by adjusting the head E longitudinally toward or from the springs, said head being provided with a threaded opening, and the rod or spindle correspondingly threaded to fit said opening, as is shown in Fig. 3. The head may be locked after adjustment by a set-nut E′ and also by a key *c*, adapted to fit in a longitudinal slot *d* in the rod or spindle, said key being of course removed to permit the head being turned to adjust the same, and replaced after said adjustment. The opposite end of rod or spindle D passes out through the cap or head C, the same being fitted to slide longitudinally in a stuffing-box G, fitted in the opening in said cap or head and made air-tight at the joints by suitable bushings *e f*.

Upon the outer end of the rod or spindle D may be formed or secured a suitable eye-loop, preferably a swivel eye-loop *g*, such as is shown in Figs. 1, 2, and 3. If desired, however, it may be made integral with the rod or spindle, as is shown at *h* in Fig. 5, or made in separate parts and fastened by a transverse pin *i*, as is shown in Fig. 7, or otherwise fastened in any suitable manner. At the opposite end of the device the eye-loop H

for connection with the cable or hawser is preferably formed integral with the cap or head B, as is shown in the drawings, but I do not limit myself thereto.

The oil is supplied to chamber A′ through suitable plugged inlets *j*, in this instance arranged in the cap or head B, and said oil is discharged from said chamber by forming longitudinal grooves *k* in the rod or spindle D, which terminate just inside of the cap or head C when the parts are in their normal positions, and thus discharge the oil only when the rod or spindle is drawn out of the body of the device a sufficient distance to bring one or more of the ends of said grooves outside of stuffing-box G, this result, it is obvious, being produced by any strain which may be imparted to the cable or hawser with which the device is connected, as when the vessel is anchored in a heavy sea or being towed by another vessel.

In order that the amount of oil discharged may be regulated to correspond to the severity of the storm and consequent disturbance of the sea, I form the grooves *k* of different lengths, or, in other words, terminate the same each a little back of the others from the end opening in the body of the device, as is shown in Fig. 5. Therefore it will be apparent that in a light storm, when only a comparatively small disturbance of the sea is produced, the strain upon the cable or hawser may cause the rod or spindle to be pulled out only a sufficient distance to bring the forward end of the longest groove outside of the stuffing-box, and the oil is discharged through that groove only, but as the storm increases and a greater amount of oil is necessitated to insure the safety of the vessel the consequent greater strain upon the cable or hawser thereby produced causes the next and possibly the third or other grooves to be brought into action for discharging an additional quantity of oil into the sea, according to the severity of the storm, which, rising to the surface and spreading, causes the well-known calming and smoothing effect upon the waves, thereby relieving the strain upon the cable or hawser and allowing the vessel to ride said waves with safety.

It will of course be understood that the device is in practice applied to the cable near the anchor and to the hawser in towing at some distance from the vessel, so as to distribute the oil on the surface of the water at a considerable distance from or in advance of the vessel, so as to calm the waves before reaching the same.

In Fig. 3 I have shown the head E provided with holes or perforations *l* for the free passage of the oil to either side of said head in chamber A′, but as the head is designed to be made to fit loose in the cylinder or casing and thus permits the oil to pass through around said head I do not limit myself to said openings or to any particular shape of head, the essential point being to provide in said head a guide for the rod or spindle and at the same time allow of a free passage of the oil to either side thereof. Neither do I limit myself to the number or arrangement of springs F in the cylinder A or to the number of grooves *k* in the rod or spindle D, an important feature as to the springs being their arrangement in the oil-chamber, where they will always be protected from injury by corrosion.

If desired, instead of forming grooves *k* in the rod or spindle for the discharge of the oil the same result may be effected by slotting said rod or spindle clear through, as is shown at *k′* in Fig. 8.

I prefer the first-described method, since it does not weaken the rod or spindle as by the other method.

By making the caps or heads B C of conical shape, pointing toward each end, it is obvious that the same will afford no obstruction to the device catching on projecting rocks or other obstructions and thus injuring the same by sudden shocks thereby imparted thereto. This is an important feature in the practical application of the device.

Although I prefer the arrangement of springs F over the central rod or spindle, as hereinbefore described, if desired they may be disposed about the rod or spindle, as is shown in Fig. 9, instead of being arranged over and concentric with it, as previously described.

Having now described my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

1. An improved, combined spring-shackle and oil-ejector for attachment to anchor-cables and towing-hawsers, comprising in combination the following elements, to wit: the cylinder or casing A; the caps or heads B, C, adapted for attachment to said cylinder ends to form an oil reservoir or chamber A′ within, extending the entire length of the interior of the device and provided with suitable plugged inlets for admitting the oil, the cap or head C being provided with a central longitudinal opening in its outer end; the stuffing-box G and bushings fitted in said opening; the longitudinal rod or spindle D, provided with the adjustable head E at its inner end, with means for attachment to the cable or hawser at its outer end, and with longitudinal grooves or slots, preferably made of different lengths, and the spiral springs F interposed between the head E on the rod or spindle and the cap or head C forming one end of the device, substantially as and for the purpose set forth.

2. In a spring-shackle, the combination of the cylinder or case A and the caps or heads B, C secured to the ends thereof to form the oil reservoir or chamber A′, with the grooved or slotted rod or spindle D having the head E and the springs F arranged in said oil reservoir or chamber, substantially as set forth.

3. In a spring-shackle, the combination of the cylinder A and caps or heads B, C, with the grooved or slotted rod D having the head

E and means for attachment to the cable or hawser and springs arranged in the oil reservoir or chamber for exerting a resistance to the tensional strain of said cable or hawser, substantially as set forth.

4. In a spring-shackle, the combination of the cylinder A, caps or heads B, C and stuffing-box G, with the central rod or spindle D having grooves or slots formed therein, whose forward ends are arranged at different distances from the opening in the cap or head C and the springs arranged in the oil reservoir or chamber, substantially as and for the purpose set forth.

5. In a spring-shackle, the cylinder A having heads B, C, in combination with the central rod or spindle with which the cable or hawser is connected, having a series of longitudinal grooves or slots whose forward ends are arranged to begin at different distances from its outer end, substantially as set forth.

6. In a spring-shackle, the combination of the cylinder A, caps or heads B, C, stuffing-box G, central rod or spindle D, springs F arranged in the oil reservoir or chamber A′, and the head E provided with perforations or openings to permit a free passage of the oil, also adapted to be adjusted and locked on said rod or spindle, substantially as set forth.

JAMES B. STONE.

Witnesses:
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