

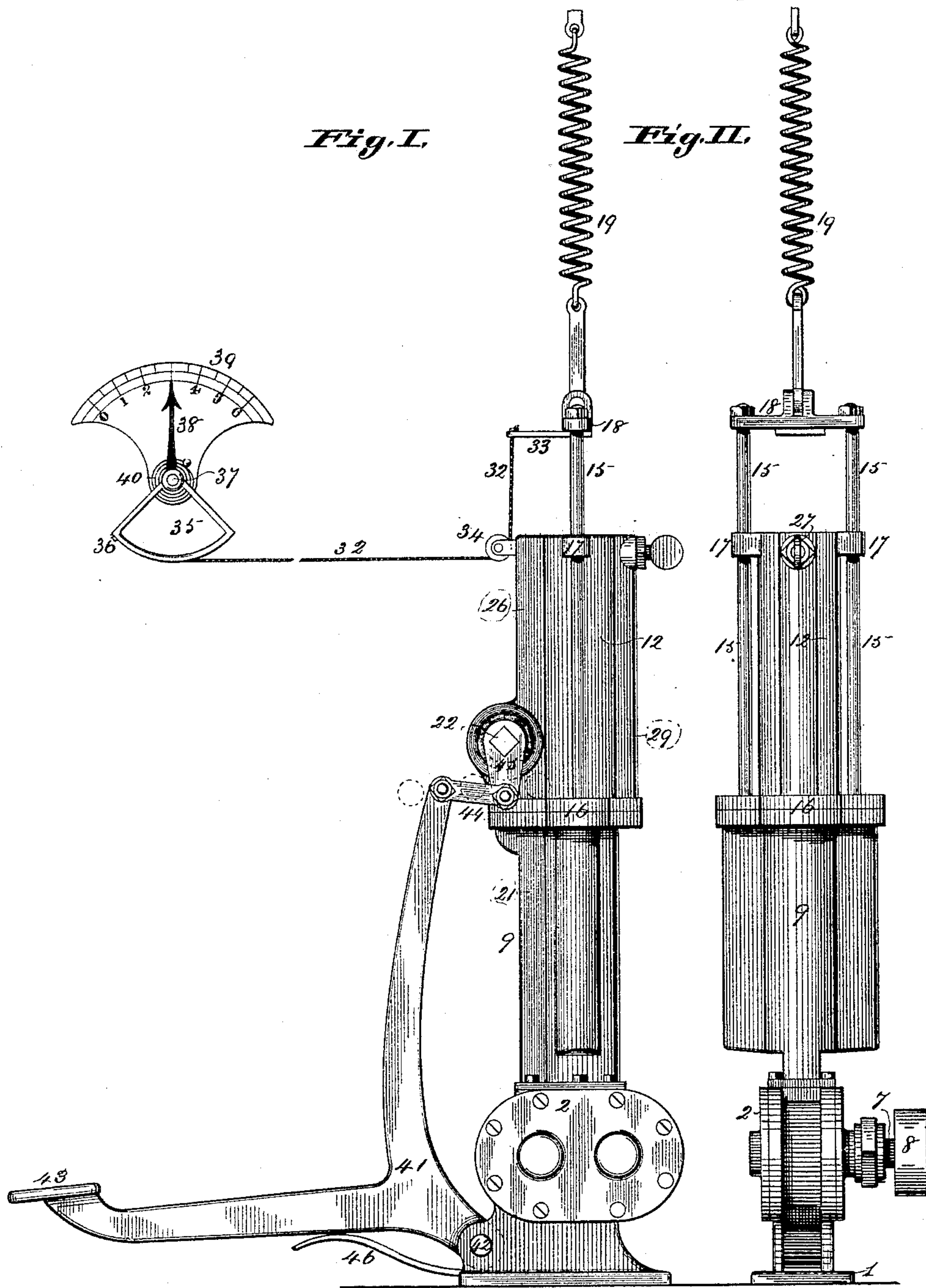
(No Model.)

2 Sheets—Sheet 1.

C. SINNING.  
DEVICE FOR REGULATING SPRING TENSION.

No. 458,920.

Patented Sept. 1, 1891.



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George E. Cruise  
Harry S. Rohrer.

Inventor:  
Charles Sinning.  
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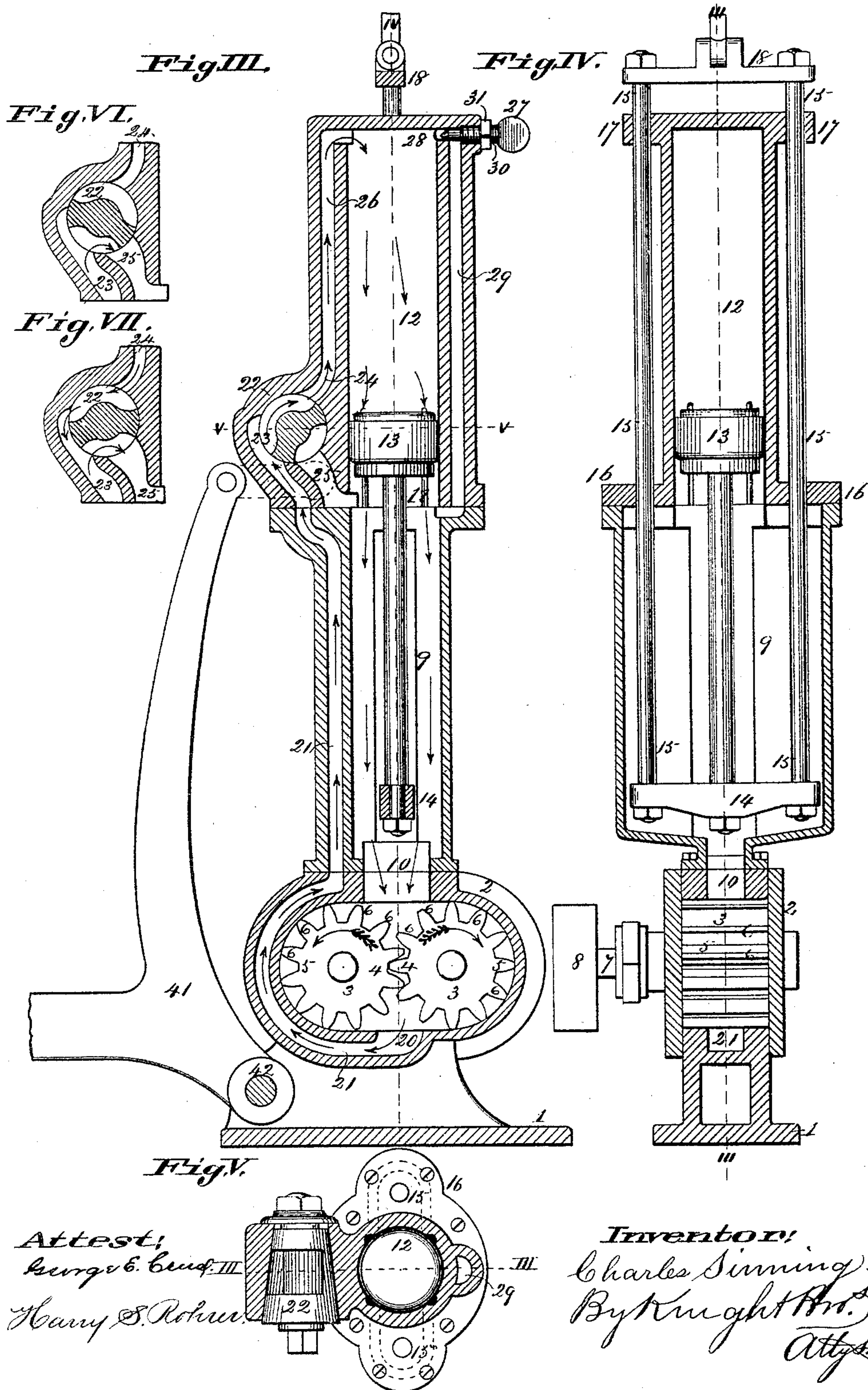
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# UNITED STATES PATENT OFFICE.

CHARLES SINNING, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE SINNING  
LASTING MACHINE COMPANY, OF SAME PLACE.

## DEVICE FOR REGULATING SPRING-TENSION.

SPECIFICATION forming part of Letters Patent No. 458,920, dated September 1, 1891.

Application filed January 12, 1891. Serial No. 377,505. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES SINNING, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Devices for Regulating Spring-Tension, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My device is intended for use on a lasting-machine substantially as described in my application for patent filed June 4, 1890, under Serial No. 354,247, the device being adapted to regulate the tension of the spring 128, by which the crimping-pinchers are drawn upward; but I do not confine my claim to the device for any special use or application.

The features of novelty will be set forth in the claim.

Figure I is a side elevation of the device. Fig. II is a rear elevation of the device. Fig. III is a vertical section taken at III III, Figs. IV and V. Fig. IV is a vertical section taken at IV IV, Fig. III. Fig. V is a horizontal section taken at V V, Fig. III. Fig. VI is a section of the three-way cock, showing its position when the tension of the spring is fixed, and Fig. VII is a similar section showing the position of the cock when the tension of the spring is being decreased, while in Fig. III the cock is shown in position for the increase of tension in the spring.

1 is the base, and 2 is the cylinder, of a double-headed rotary pump. This form of pump I prefer; but it is obvious that a pump of any one of many other well-known forms might be used without essentially changing the principle of the invention. The pump, as shown, has two pistons 3 in the form of spur-wheels engaging with each other at the contiguous sides 4 and fitting the interior of the cylinder at their outer sides 5. The cogs 6 are so formed that there shall be little or no leakage at the point of engagement 4 4. Upon the shaft 7 of one of the pistons is a pulley or wheel 8, by which the pistons are continuously driven by a belt upon the pulley or other means. The shaft 7 should pass through a stuffing-box, as shown in Figs. II and IV.

9 is a case or chamber above the cylinder 2 and in connection therewith by a port 10, and

in communication at top by a port 11 with a cylinder 12, in which works a piston 13. The piston-rod extends downward and carries at its lower end a cross-head 14, to whose ends are connected the lower ends of rods 15. The rods work through the top 16 of the chamber 9 and through guides 17 at the top of the cylinder 12, and their upper ends are connected to a cross bar or head 18, to whose middle is attached one end of the spiral spring 19. The port 10 is the induction-port of the cylinder 2, the pistons 3 rotating in the direction shown by the arrows.

20 is the eduction-port of the cylinder, connected by a duct 21 with the three-way cock 22. The cock has a port 23, with which the duct 21 connects, and two ports 24 and 25, the former of which connects by a duct 26 with the upper part of the cylinder 12, while the port 25 connects with the chamber 9. The plug of the cock is so formed that the ports 23 may be thrown in communication with the port 24, as seen in Fig. III, the port 25, as seen in Fig. VI, or in communication with both of these ports, 24 and 25, as seen in Fig. VII. In the first case (see Fig. III) the liquid, which fills all the chambers and passages, is forced by the pump into the cylinder 12 above the piston 13 and forces the latter down, thus increasing the tension of the spring 19. In the second case (see Fig. VI) the liquid simply flows from the pump into the chamber 9 and back to the pump and the tension of the spring 19 remains unchanged. In the third case (see Fig. VII) the current of liquid from the pump takes the same course as in the second case, while the piston 13 is drawn upward by the spring 19 and the liquid escapes from the cylinder 12 through the duct 26 and ports 24, 23, and 25 into the chamber 9, and so into the cylinder 12 below the piston 13.

27 is a valve whose port 28 communicates by a duct 29 with the chamber 9, so that when the valve is open the spring 19 may draw the piston 13 upward in the cylinder. This valve 27 has a screw-stem 30, on which is shown a set-nut 31.

The tension of the spring may be indicated by the following device: 32 is a cord attached to the cross-bar 18 or to a projection 33 thereon. This cord passes beneath a pulley 34



and to a sector-frame 35, to which the end of the cord is attached at 36. The sector turns on an arbor or shaft 37 and carries a finger 38, movable in front of a fixed scale 39. 40 is a spring secured at one end to a fixed point and at the other end to the sector and adapted to keep the cord 32 taut and move the finger 38 to the right, the cord having bearing in the grooved periphery of the sector. As the spring 19 is stretched by the descent of the piston 13 and the tension of the spring increased, the finger 38 moves to the right and indicates upon the scale the degree of tension in the spring. 41 is a treadle-lever fulcrumed to the base or cylinder frame at 42 and having the form of a bell-crank. The horizontal arm has a foot-plate 43. The upright arm is connected by a link 44 to the arm 45 of the three-way cock 22, so that the movement of the treadle-lever upon its fulcrum 42 will cause the turning of the three-way cock. 46 is a spring tending to lift the horizontal arm of the treadle and to throw the cock into the position seen in Fig. III, the cock being moved in the other direction by pressure of the foot on the plate 43.

It is obvious that the pump might be dispensed with if the port 23 were in communication with liquid under pressure or in an elevated reservoir and the liquid allowed to flow to waste or to another reservoir through the port 25, it being only necessary that liquid under sufficient pressure should be supplied to the port 23 and allowed to flow from the port 25 against a smaller degree of pressure or no pressure at all.

I claim herein as new and of my invention—

1. The combination of a cylinder 12, a piston 13 in the cylinder, a spring connected with the piston, a pump having its induction and eduction ports communicating, respectively, with the opposite ends of the cylinder, and a three-way cock 22, adapted to operate substantially as and for the purpose set forth.

2. The combination of a three-way cock 22, having ports 23, 24, and 25, a cylinder in direct connection with the port 24 and in connection with the ports 23 and 25 through the cock, a piston working in the cylinder, a spring connected with the piston, and a forced liquid-supply to the port 23, substantially as set forth.

3. The combination, in a device for regulating the tension of springs, of a spring 19, a piston 13, connected with the spring, so that the movement of the piston changes the tension of the spring, a cylinder in which the piston works, a pump with induction and eduction ports communicating, respectively, with the opposite ends of the cylinder, a three-way cock 22 between the pump and cylinder, and a treadle connected to the three-way cock, all substantially as and for the purpose set forth.

4. In a device for regulating spring-tension, the combination, with the pump, of the cylinder 12, the chamber 9, in communication with the cylinder 12 and with said pump, the piston in said cylinder having means of connection with a spring, said cylinder having ports 25 26 above and below said piston, respectively, a three-way cock for connecting or disconnecting said ports, and the duct 21, leading from the pump to said cock and adapted to be placed into communication with either or both of said ports, substantially as set forth.

5. The combination, with a pump, of the cylinder 12, the chamber 9, arranged between said pump and cylinder and having connection with both, a piston in said cylinder, said cylinder having ports 24 25 communicating therewith above and below said piston, the duct 21, leading from the pump, a three-way cock for placing said ports in communication with each other and with the duct 21 alternately, the duct 29, communicating with the cylinder 12 above and below said piston, and a valve for closing said duct 29, substantially as set forth.

6. The combination, with the pump and the spring 19, of the cylinder, a piston in said cylinder, the chamber 9, communicating with said pump and cylinder, a rod secured to said piston and projecting into the chamber 9 and having suitable connection with said spring, said cylinder having ports communicating therewith on both sides of the piston and with the pump, and a cock for governing said ports, substantially as set forth.

CHARLES SINNING.

In presence of—

E. S. KNIGHT,  
THOMAS KNIGHT.