

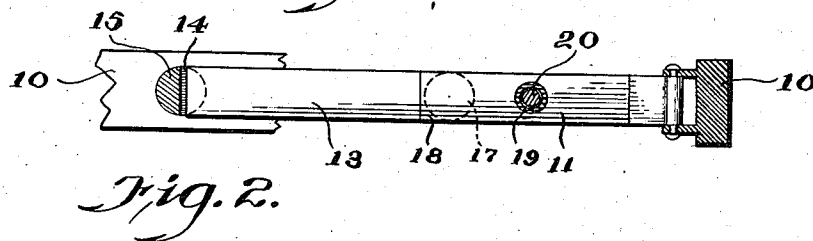
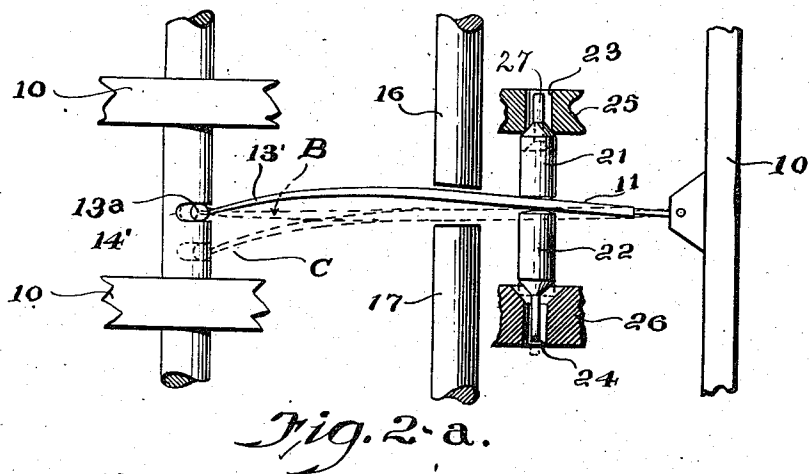
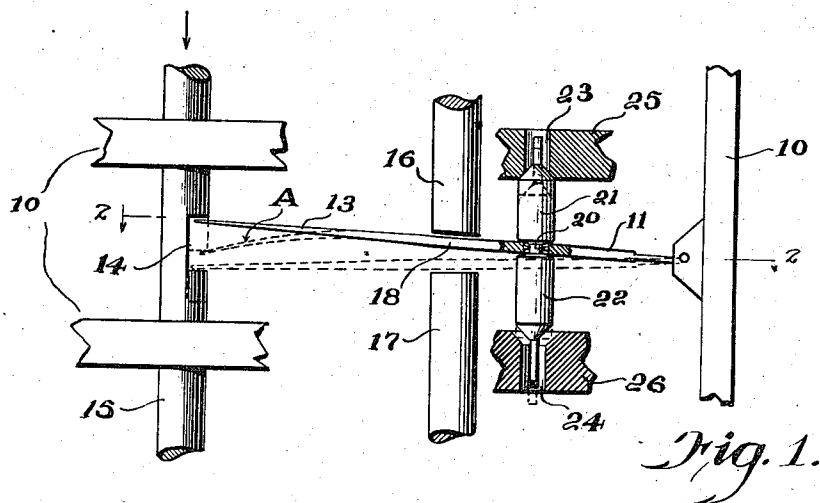
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KINETIC DEVICE

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KINETIC DEVICE.

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The invention relates to specific means for utilizing a permanent magnet element to develop and store kinetic energy in a manner to be available for use, and the present embodiment of the invention presents a means for utilization of the energy intermittently.

Objects, advantages and features of invention reside in the structure, arrangement and combination of parts involved, which will be readily understood from the following description of the embodiment of the invention and from the accompanying drawings representing the same, in which, Figure 1 is an elevational view partly in section, of apparatus embodying the invention.

Figure 2 is a horizontal sectional view on the line 2-2 of Figure 1.

Figure 2^a is a view like Figure 1 showing modification.

There is illustrated a framing 10, on which a lever 11 is pivoted for oscillation in a vertical plane, its outer part being tapered to provide a spring element 13 as an integral part, although it may be separately formed if desired. The extremity of the lever rests in a notch 14 of a vertical rod 15 or prime mover, mounted for reciprocation in any suitable manner, and which may be operated by any means; as, a float, a pressure-responsive device, speed responsive device, or otherwise. The notch is of a dimension longitudinally of the rod to permit a certain movement of the lever therein, the degree of movement being correlated to magnet parts to be described. The lever is preferably so located that its mean position is perpendicular to the rod, although this is not essential. A permanent magnet is provided, the respective poles 16 and 17 only of which are shown, located on opposite sides of the lever in line with its path of movement and at a distance apart such that the lever will at all times be within a part of the field that will exert an appreciable pull from the poles of the magnet, and when slightly displaced from a medial position in either direction will be forcibly drawn toward the limit of its movement. The rod has such movement and the notch 14 has such length that when, under movement of the rod in one direction the lever has been moved from one limit of movement and is drawn to the opposite limit of

its movement, the end of the notch in that direction will not obstruct its movement. Under certain conditions this is not essential, and the notch may be of lesser dimension if desired, and in fact loose play between the lever and rod may be eliminated, if desired.

That part of the lever adjacent the magnet serves as an armature 18, and may comprise a separate soft iron piece united with or secured upon the other parts if desired. The body of the lever is shown as broad and flat, and of sufficient thickness from its pivot to the armature portion to resist strain under stress exerted by the spring portion and magnet.

Intermediately of the pivot and armature the lever has formed therethrough a small aperture 19, the edge of which is rabbeted as shown and this aperture receives loosely the central stem 20 of a double valve having enlarged valve heads 21 and 22 at the ends, on which are formed outwardly disposed conical seat faces. These are positioned to alternately seat in ports 23 and 24, respectively formed in elements 25 and 26, which may be parts of conduits or containers.

In the operation of this form of the device, the rod requires of course to be operated by a means having sufficient power to move the lever as described. The parts being initially in the position shown in Figure 1, downward movement of the rod will gradually flex the lever spring part 13 until the parts reach the position dotted at A in Figure 1, at or about which position the force of the upper pole of the magnet is overcome, and the resiliency of the lever spring will abruptly move the armature and body of the lever, and immediately thereafter the valve device, all toward the opposite limits of their motion. Almost at the same instant, the armature portion of the lever enters the lower field of the magnet and is subjected to the unbalanced pull of the lower pole this further augmenting the speed of the movement of the parts, snapping the lower valve head into its seat firmly.

While the valves are shown with reduced stems 27 extended through the ports, it is not believed that these are essential, as the valve heads are held in proper alinement when one is seated, and the shift to the op-

posite position is so rapid that the open valve does not have opportunity to fall out of proper seating position.

It should be noted that there is a clearance between the stem 20 and the sides of the aperture 19.

There is shown in Figure 2^a an arrangement where loose movement between the lever spring and the notch of the prime mover or rod of the first figures is eliminated. In this instance, the extremity of the spring 13' is formed with a terminal enlargement 13^a in the form of a transverse cylindrical bar, and the notch 14' of the rod is arranged to receive the enlargement snugly for sliding movement therein transversely of the rod. This permits a line bearing between the enlargement and the sides of the notch, without offering any interference with the flexing of the spring. The construction of the remaining parts of the device is otherwise the same as first described.

In the operation of this form of the device after a certain downward movement of the rod the parts reach the position shown in full lines in Figure 2^a, at about which time the tension of the spring will overcome the attraction of the upper magnet pole and the spring will throw the armature downward where the lower pole will by its attractive effect accelerate the movement and complete it. At this lower position of the armature parts the spring may or may not be straight, for if the notch of the rod has not moved enough to permit the spring to be relieved of opposition, the momentum of the armature and lever and valve parts and the force of the lower pole of the magnet will cause completion even if opposing strain is set up in the spring as at B in Figure 2^a. The rod may begin its return movement before the spring is relieved from tension opposing completion of its movement. Or, as indicated at C in Figure 2^a the rod may have further movement and cause a repeated flexure of the spring in the same direction which caused the last operation, before beginning its return for opposite operation of the lever and valve parts.

In the operation of my device it will be

seen that the spring elements put under strain by the prime movers become storage elements for kinetic energy, which is exerted usefully when the stress finally exceeds the power of the magnet. The work performed is a result of the energy exerted by the magnet in opposing the movement of the lever and causing the storage of energy in the spring. The slow movement and moderate pressure on the extremity of the spring device is converted into a rapid and more powerful movement which is still further augmented by the power of the field of the magnet as the armature passes from within the major influence of one pole to the superior influence of the other.

In this invention, as in all devices wherein an armature and magnet are correlated to function, it is anticipated that either may become the movable member.

It should be understood that it has not been intended to indicate that the spring is essential, and the device is not dependent entirely on the interposition of a resilient element between the armature and the prime mover; for the storage of energy will occur in the progressively increased stress developed in overcoming the attraction of either pole of the magnet. The spring serves to function where the rod moves with very great power, and delays operation of the device, or permits a certain amount of lost motion before movement of the rod in either direction causes functioning of the device.

I claim:

The combination of opposed valve seats, a double valve reciprocable therebetween for alternate seating thereon, an operating member connected therewith including an armature movable therewith, spaced opposed polar magnets the armature being arranged to receive the denser parts of the magnet fields at respective limits of its movement, a reciprocating prime mover, and a resilient connection between the prime mover and the operating member.

In testimony whereof I affix my signature.

CHARLES A. FISHER.