(No Model.)

H. L. HOPKINS.

MOVEMENT CURE APPARATUS.

No. 407,071. Patented July 16, 1889.

Fig. 1

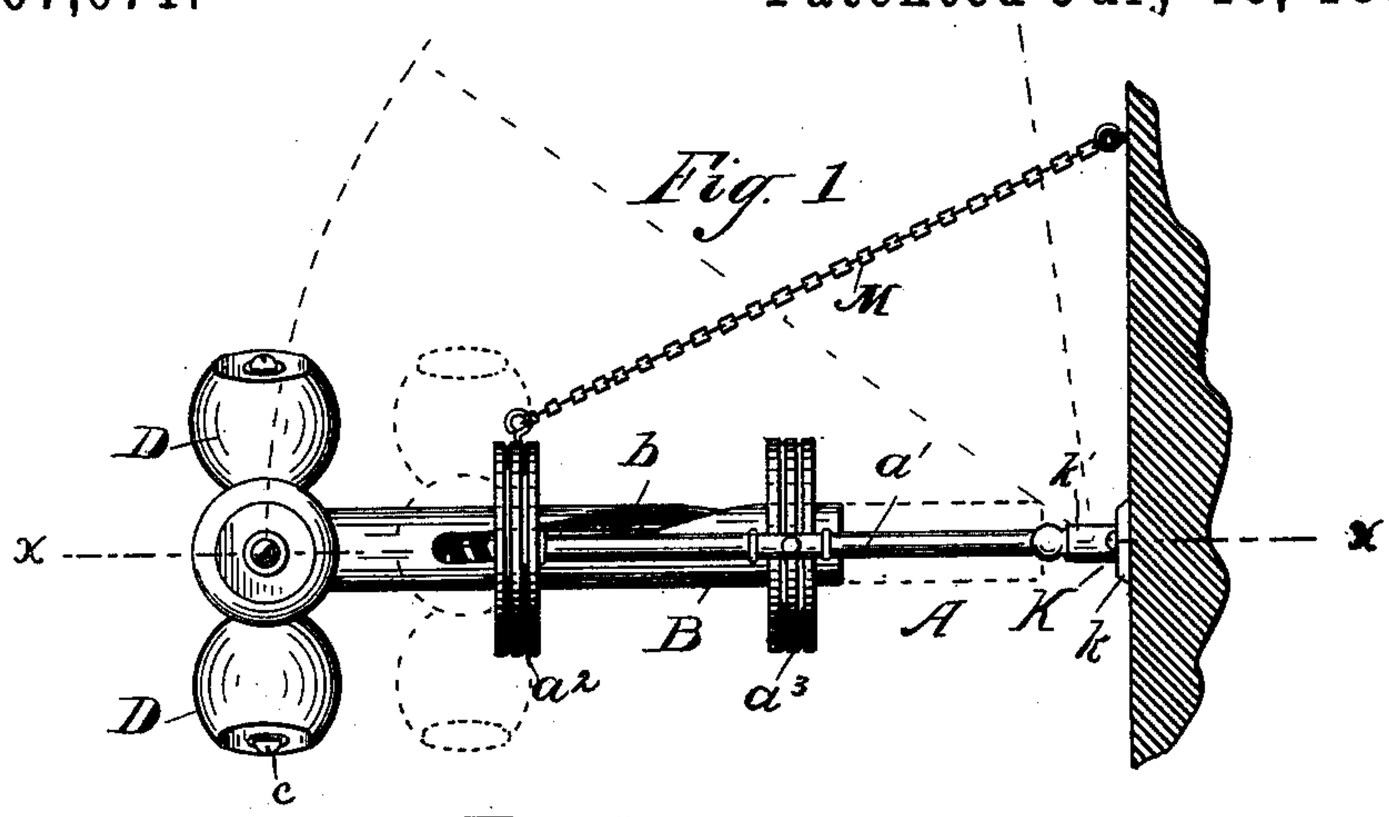


Fig. 3.

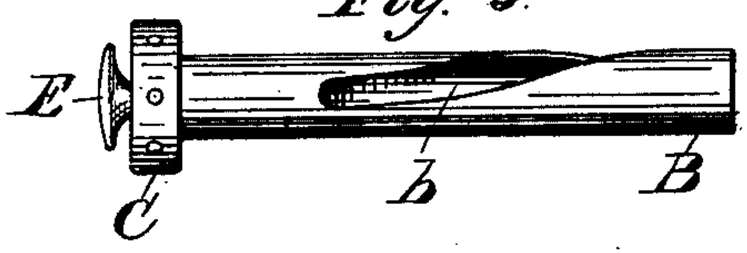


Fig. 2

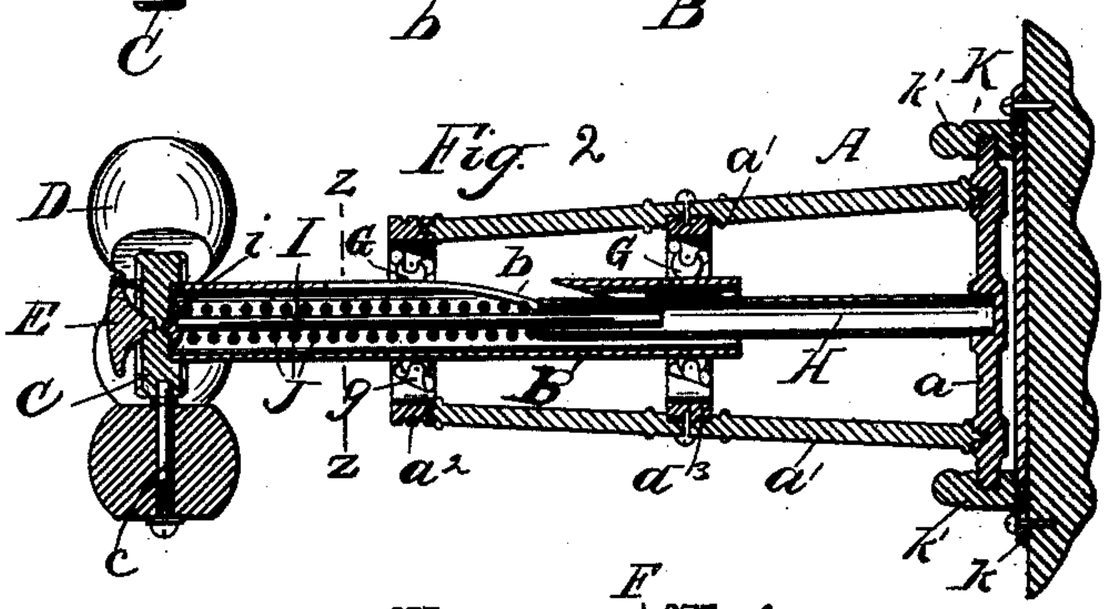


Fig 4.

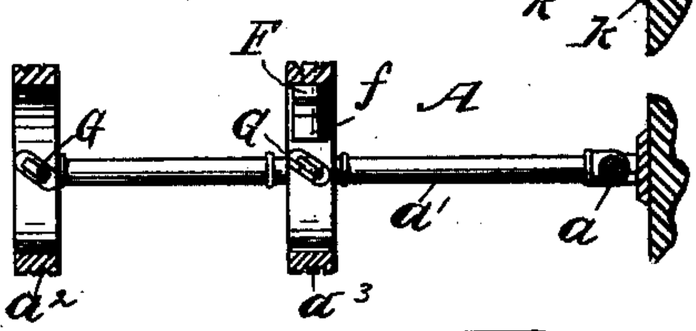


Fig. 5

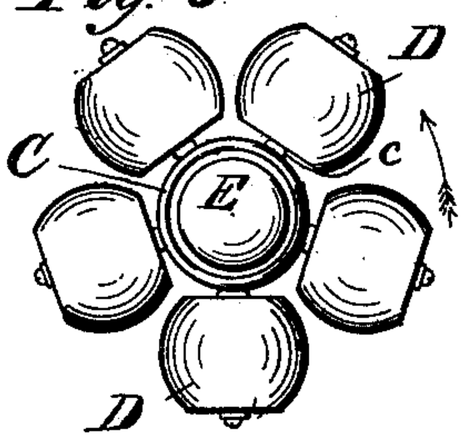
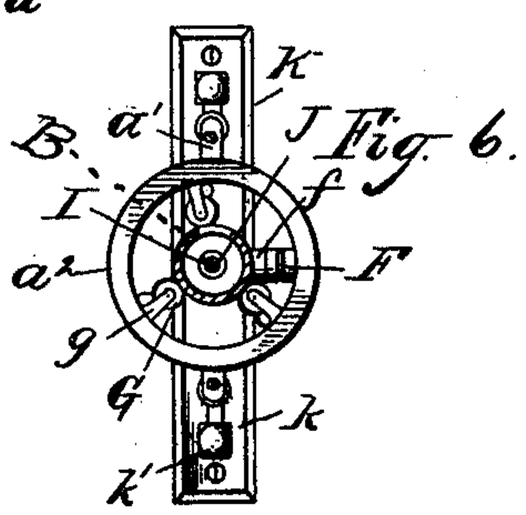


Fig. 6.



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UNITED STATES PATENT OFFICE.

HARVEY L. HOPKINS, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE PERISTALT MACHINE COMPANY, OF SAME PLACE.

MOVEMENT-CURE APPARATUS.

SPECIFICATION forming part of Letters Patent No. 407,071, dated July 16, 1889.

Application filed April 26, 1888. Serial No. 271,995. (No model.)

To all whom it may concern:

Be it known that I, HARVEY L. HOPKINS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Movement-Cure Apparatus, which is fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a side elevation of the apparatus attached to a wall or other suitable support; Fig. 2, a plan section of the same, taken on the line *x x* of Fig. 1; Fig. 3, a detail elevation of the rotary tubular shaft; Fig. 4, a detail section of the same, the tubular shaft and parts belonging thereto being removed, taken on the line *y y* of Fig. 2; Fig. 5, an end elevation of the apparatus, and Fig. 6 a transverse section taken on the line *z z* of Fig. 2.

My invention relates to mechanism for special application in the general system of what is well known as the "movement cure." In carrying out this system mechanical appliances have been devised adapted for application to different parts of the body.

It is the object of my present invention to provide an apparatus for application to the abdomen and adapted to assist or stimulate peristaltic action, and also to obtain a mechanism which is automatic in its action in so far as the desired motion or movement of the operative device is obtained by the pressure of the person upon it, or vice versa.

In the drawings, A represents a supporting-frame, and consists of a cross-bar or base *a* and side bars *a'*, attached to the base and inclining slightly toward each other, and two rings a^2 and a^3, the former being mounted between the free or outer ends of the side bars and the latter attached to said bars about midway of their length. The tubular shaft B is open at one end and has a spiral slot *b* cut therein, said cut running nearly its entire length. A circular head C is fastened to one end of this shaft, and is provided with a series of radial pins *c*, fastened thereto, on which balls or rollers D are loosely mounted, the pins serving as journals for the balls. The number of balls mounted on this head may be varied. In the drawings five are shown, which I have found a desirable number for practical results. On the outer face of the head C is a large button or cap E, which is stepped loosely into the head, so that the latter may turn on the button or the button on the head. A radial pin F is secured to the inside of the center ring a^3 and projects inward sufficiently to enter the spiral slot in the tubular shaft when the latter is passed through the rings, as shown in Fig. 2 of the drawings. This pin is preferably provided with a small roller *f* on its free end, which is arranged within the spiral slot, and reduces the friction in the reciprocal movement of the tube. As already indicated, the tubular shaft is intended to be mounted in the supporting-frame by passing it inward through the two rings already mentioned, and in order to hold the shaft in place and guide it in its reciprocal movement small rollers G are mounted in suitable brackets *g* on the inside of the respective rings, the brackets being extended inward and the rollers being sized so as to just permit the shaft to pass in between the rollers, leaving them in contact with its surface. These rollers are preferably of rubber or some other elastic material, and are set at an inclination to the axis of the shaft, as shown in Figs. 2 and 4 of the drawings, the angle of inclination corresponding to the pitch of the spiral slot in the shaft. The number of these rollers should be sufficient to give the shaft a firm and durable support. In the drawings three are shown on each ring, which I have found a suitable number in practice.

Now, it is obvious that if the tubular shaft is mounted in the frame within the rings, as described, it will be rotated first in one direction and then in the other by reciprocating it upon its supports. It is desirable for proper action that the shaft be held outward by a spring or some other device which will offer an elastic resistance to its movement inward. For this purpose I provide a small tube H, one end of which is loosely seated in the cross-bar *a* of the frame and the other extends outward into the open end of the tubular shaft some distance. A rod I is provided and ar-

ranged within the tubular shaft, one end entering the outer open end of the tube H and the other provided with a small conical button *i*, which is seated loosely in the inner face of the head C, as shown in Fig. 2 of the drawings. A spiral spring J is arranged upon this rod within the shaft, being held between the button on the end of the rod and the outer end of the tube H, the rod itself serving as the axis and guide of the spring. Obviously under this arrangement of the parts described the action of the spring will thrust the shaft outward, as shown in Figs. 1 and 2 of the drawings, and tend to hold it in the position there shown. At the same time the shaft B may be pushed inward within the frame, the spring yielding for this purpose, and during this inward thrust the shaft will be rotated in one direction, while when relieved from external pressure the spring will immediately force the shaft outward again, during which movement it will be rotated in the opposite direction.

For practical operation the apparatus is secured in a horizontal position, as shown in Fig. 1 of the drawings, and at a height corresponding to that of the person using the apparatus, so that the revolving head may be applied directly to the abdomen when the person is standing. In this position the person pushes the shaft inward, thereby causing it to rotate, as already described, and the balls D, being carried around with the shaft and in contact with the person, will rotate on their own axes by such frictional contact, thereby producing the desired action in this system of movement cure. The construction and arrangement of the devices should be such that the movement of the shaft and the balls thereon when pushed inward will be in harmony with the peristaltic action of the bowels. The direction of the rotation of the shaft is indicated by the arrow in Fig. 5 of the drawings. The large button on the outer face of the head does not rotate, being loose in the head, as already explained. This button takes the central pressure of the thrust inward, and so obviates the rubbing friction which would be occasioned if the person came directly in contact with the head itself. The button is removable at will, and different sizes may be provided for interchange, as may be desired. At the end of the inward movement of the shaft contact with the person should be interrupted, so that as the spring pushes the shaft outward again there will be no reverse action of the balls upon the person.

The machine may be fastened to the wall or other support in a permanent horizontal position if desired; but for convenience I prefer to hinge it to such support, so that it may be readily adjusted to different heights and may also be swung up out of the way when not in use. This is the construction which is shown in the drawings, and the result is accomplished by mounting the cross-bar *a* in pivotal bearings in a bracket K, which in turn is securely fastened to the wall or other upright support. As shown, the bracket K is composed of a main plate *k* and posts *k'*, attached thereto, in which the frame is pivotally mounted, as shown in Fig. 2 of the drawings. A chain or cord M is provided connected to the frame of the machine and to the wall or upright support, as seen in Fig. 1 of the drawings, by which the machine is held suspended in the position desired for use, and obviously with this suspending device the machine may be fixed at different heights, and also may be swung up out of the way, as indicated in dotted lines on Fig. 1 of the drawings.

The arrangement of the guiding-rollers between which the shaft slides upon an angle corresponding to the pitch of the spiral slot in the shaft is important for the prevention of undue friction. If these rollers were set straight or parallel to the axis of the shaft, it is evident that the rotation of the latter would produce a rubbing or grinding effect that would greatly increase the frictional resistance to the rotation of the shaft. Another result of the construction and arrangement of the parts described is that the mechanism can be readily taken apart.

Referring to Fig. 2 of the drawings, the tube H, being set loosely in the cross-bar, may be pushed outward in the tubular shaft, until it is removed from its seat. Then upon moving it a little to one side it may be pulled out entirely from the shaft, whereupon the rod and spring may at once be removed from their position within the latter. The shaft itself, however, cannot be removed from its position without removing the pin that enters the spiral slot.

I have now described all the details of a practical operative machine; but I do not wish to be understood as restricting my invention to all of these details in structure, for I am aware that changes may be made in many of these details and still the main features of my machine be retained. The required rotation of the shaft which carries the balls may be effected by other devices than those here shown and described, and the elastic resistance to the longitudinal movement of the shaft may be obtained in many ways different from that herein specified.

The characteristic feature of my invention is the shaft provided with balls upon its outer end and rotated by the pressure upon the end of the shaft to give it a movement lengthwise. The particular means by which said rotation is given and a return movement of the shaft obtained are minor elements and may be varied.

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

1. In an apparatus for the purpose described, a sliding shaft, in combination with rollers mounted on one end thereof, a support for said shaft on which it is movable lengthwise,

and a device adapted to rotate the shaft by the sliding movement of the latter on its support, substantially as and for the purposes specified.

2. The tubular shaft provided with a spiral slot, in combination with balls mounted loosely on journals set radially to the shaft at one end thereof, a supporting-frame provided with bearings for the shaft, upon which it may be reciprocated lengthwise, and a pin on said frame arranged to enter the spiral slot in the shaft, substantially as and for the purposes specified.

3. The frame A, in combination with the tubular shaft B, having a spiral slot *b*, the balls D, set loosely on the journals *c*, arranged at the end of the shaft mounted radially thereto, the pin F, arranged on the frame to enter the slot in the shaft, and a spring arranged to thrust the shaft outward from the frame, substantially as and for the purposes specified.

4. The frame A, provided with the rings a^2 a^3, in combination with the sliding and rotating shaft B, arranged to slide back and forth within said rings, and the balls D, mounted on radial pins on the outer end of said shaft, substantially as and for the purposes specified.

5. The supporting-frame, in combination with the sliding and rotating shaft, and bearing-rollers on the frame set at an angle to the axis of the shaft, substantially as and for the purposes specified.

6. The supporting-frame, in combination with the sliding tubular shaft provided with a spiral slot, the stationary pin arranged to enter said slot, and the bearing and guiding rollers on the frame inclined to the axis of the shaft at an angle corresponding to the pitch of the spiral slot, substantially as and for the purposes specified.

7. The supporting-frame A, in combination with the sliding and rotating shaft B, the balls D, mounted on the outer end thereof, the tube H, the rod I, and the spring J, substantially as and for the purposes specified.

8. The sliding and rotating shaft, in combination with the button E, mounted in a loose bearing at the end of the shaft, and the balls D, mounted loosely on journals set radially at the outer end of said shaft, substantially as and for the purposes specified.

9. The supporting-frame mounted on pivotal bearings at its inner end, in combination with the sliding rotary shafts, and the balls mounted loosely on the outer end thereof, substantially as and for the purposes specified.

10. The frame A, pivoted to the wall or other suitable support, in combination with the sliding shaft B mounted thereon, the balls D, mounted loosely on the outer end of the shaft, the spring operating to thrust the shaft outward, and the suspending and adjusting chain, substantially as and for the purposes specified.

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