Sept. 27, 1938. B. J. PALMER ET AL 2,131,234

UNIFORM SPEED DRIVING APPARATUS

Filed July 19, 1937 3 Sheets-Sheet 1

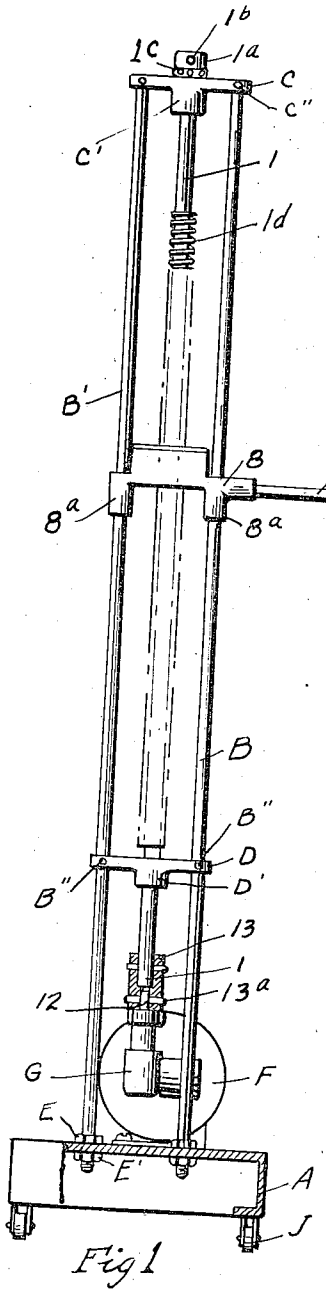


Fig 1

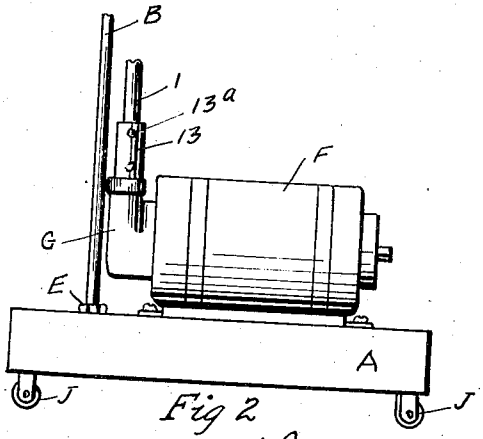


Fig 2

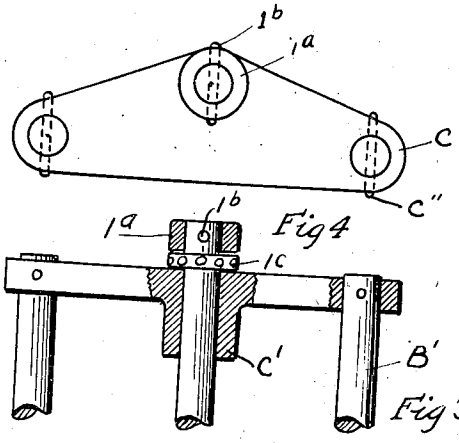


Fig 4

Fig 3

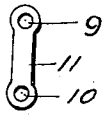


Fig 5

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UNIFORM SPEED DRIVING APPARATUS

Filed July 19, 1937 3 Sheets-Sheet 2

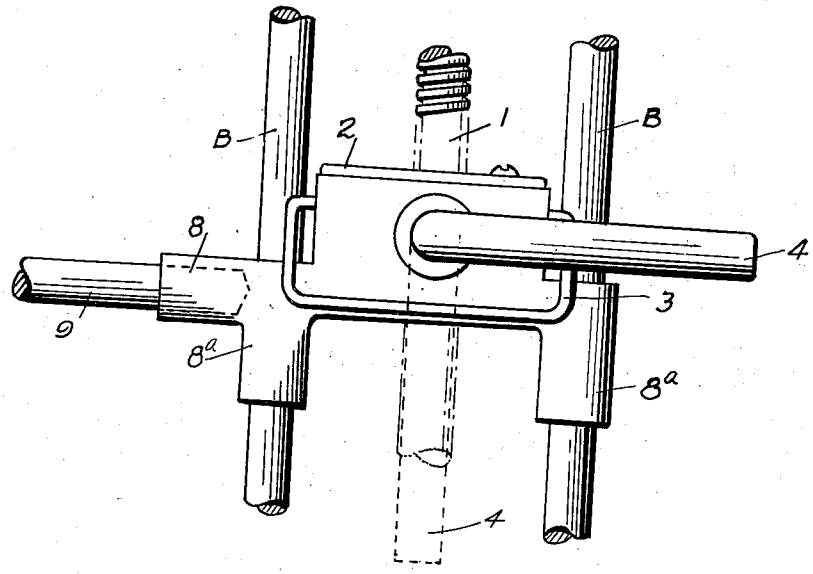


Fig 6

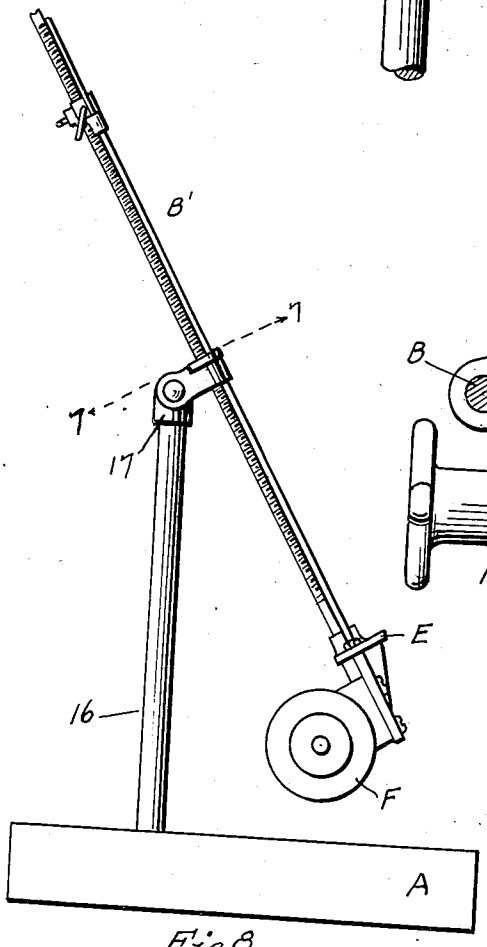


Fig 8

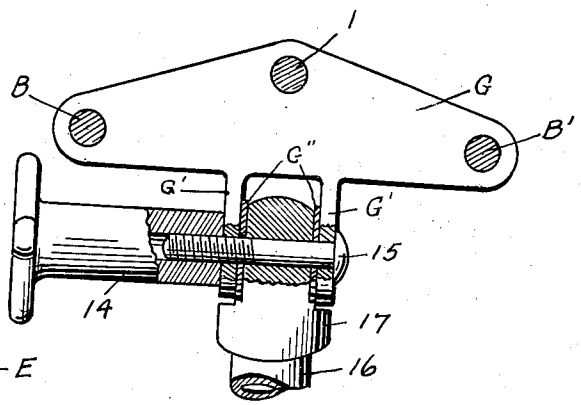


Fig 7

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Sept. 27, 1938. B. J. PALMER ET AL 2,131,234

UNIFORM SPEED DRIVING APPARATUS

Filed July 19, 1937 3 Sheets-Sheet 3

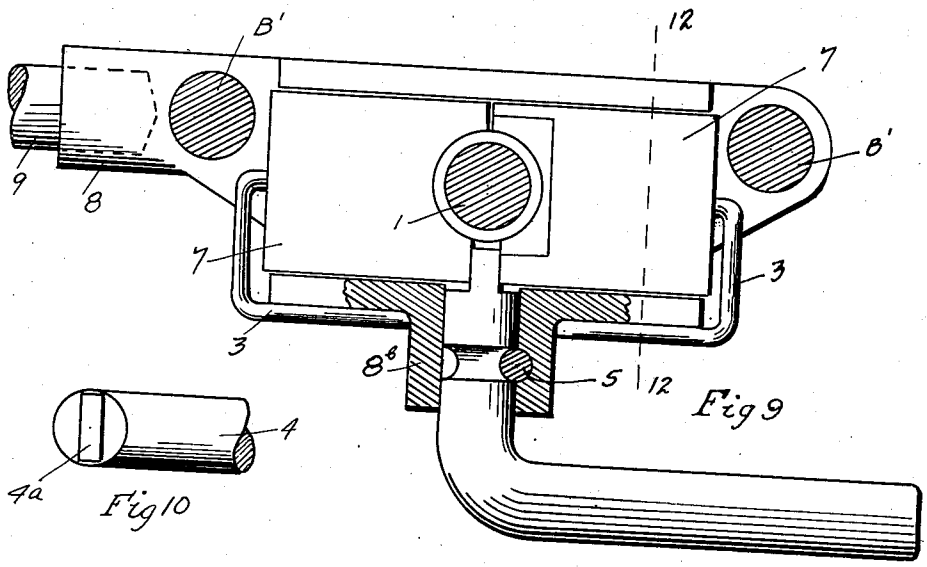


Fig 9

Fig 10

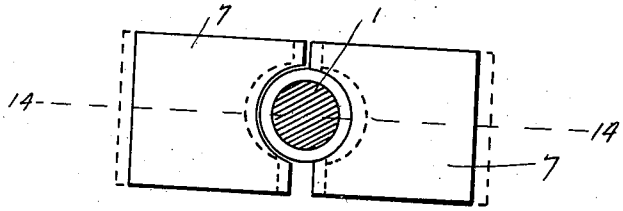


Fig 11

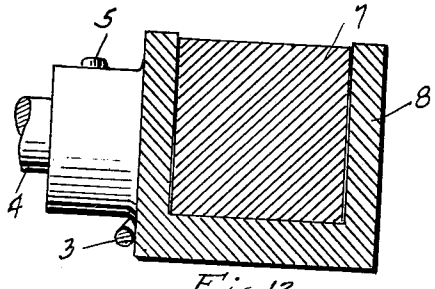


Fig 12

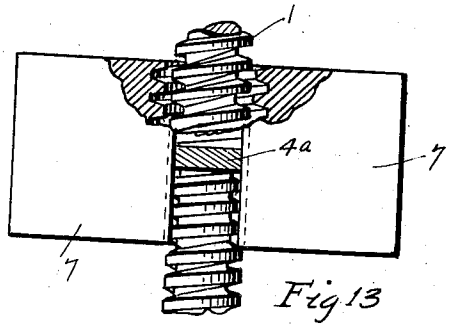


Fig 13

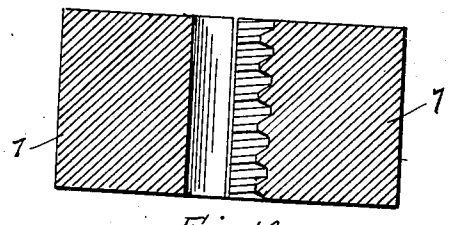


Fig 14

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Patented Sept. 27, 1938 2,131,234

UNITED STATES PATENT OFFICE

2,131,234

UNIFORM SPEED DRIVING APPARATUS

Bartlett J. Palmer and Otto A. Schiernbeck, Davenport, Iowa

Application July 19, 1937, Serial No. 154,450

11 Claims. (Cl. 254—100)

Our invention relates to a uniform-speed driving apparatus and is designed primarily to afford means for carrying a neurocalometer or similar instrument, at a uniform speed along the back of a patient whose variations in spinal temperatures are being taken or compared and recorded.

The objects of our invention are: to provide a driving apparatus by which a carrier adapted to support and carry a neurocalometer or other instrument for which a uniform rate of movement is desirable, may be driven or moved at a fixed, predetermined and uniform rate of movement; to provide means by which progressive application of a neurocalometer to the back of a patient may be made with a uniform rate of movement from the bottom to the top of the spine, or vice versa; to provide means by which a neurocalometer or similar instrument utilized in connection with suitable recording apparatus for the purpose of making records or graphs showing comparative variations in temperature along the spinal column, may be carried along the spine at a uniform, predetermined rate; and which will permit free lateral manual guidance of the neurocalometer relative to the median line of the spine to provide a cross-member slidably mounted upon a threaded bolt and having spring-held means to engage the thread of the bolt, and manually operable means to disengage same; and to provide improved means for engaging and disengaging the threads of a bolt with adjustably threaded members slidingly mounted thereon.

We attain these objects by the means illustrated in the accompanying drawings, in which,—

Figure 1 shows a front elevation of our apparatus;

Figure 2 shows a detail side elevation of the base, motor and part of the supporting and driving rods;

Figure 3 is an enlarged sectional elevation of the upper part of our apparatus;

Figure 4 is a top or plan view thereof;

Figure 5 is a detail side elevation of the carrier;

Figure 6 is an enlarged detail rear elevation of the traveling crosshead;

Figure 7 is an enlarged detail of the tilting mechanism of the form of apparatus shown in Figure 8;

Figure 8 is a side elevation of a preferred form of apparatus which shows the supporting rods mounted upon a pivoted bracket so as to be tiltable to the front as desired;

Figure 9 is an enlarged top detail view of the traveling crosshead, but with the cover plate, 2, removed;

Figure 10 is a detail showing the lever head with cam attached which acts to separate the two members of the split nut;

Figure 11 is an enlarged detail of the split nut members showing them in solid lines in engagement and in dotted lines in their released position;

Figure 12 is a detail showing the crosshead and split nut member, 7, in section on the line 12—12 of Figure 9.

Figure 13 shows the relative position of the cam and split nut members when disengaged;

Figure 14 is a sectional detail of the split nut on the line 14—14 of Figure 11, showing one split nut member threaded and one not threaded.

Similar numerals refer to similar parts throughout the several views.

Our apparatus comprises a base, A, which is preferably formed of a rectangular hollow casting and provided with casters, J.

The base, A, may be positioned at the bottom of the apparatus and adapted to be moved around on the floor by the casters, J, or the base, A, may be rigidly secured as a bracket to the ceiling or side wall.

A pair of parallel supporting bars, B and B', are rigidly secured to the base by nuts, E and E', or other suitable means and may stand upright in the base or may depend from the base, A, when used as a bracket and attached to a ceiling.

Upon the supporting rods, B and B', we mount a stationary bracket, D, formed with downwardly projecting sleeves, D', and secured to the rods, B and B', by pins, B''.

We prefer to form the bracket, D, with bores near the outer ends adapted to embrace the supporting rods, B and B', and with a bore at the middle in which a drive shaft, 1, is mounted so as to turn freely. The lower portion of the shaft, 1, is united to the upper end of a tubular, flexible sleeve, 13. The lower end of the sleeve, 13, is united to the upper end of a drive shaft, 12, which is preferably driven by a worm gear mounted upon the lower end of the shaft, 12, which in turn is driven by a worm mounted upon the shaft of the motor, F.

The motor, F, the worm gear, and gear housing, G, are well known and in common use and we make no claim to any particular type of motor or driving gear, as any desired type may be utilized if properly proportioned for the work to be done.

The upper portion of the shaft, 1, extends through a bore in the middle of the top bracket, C, the outer ends of which are secured upon the

upper ends of the supporting rods, B and B', by pressfit or other suitable means, and the sleeve, C', extending downwardly from the bracket.

A cap, *1a*, is secured upon the upper end of the shaft, *1*, by a pin, *1b*, or other suitable means, and a ball-bearing, *1c*, is inserted between the cap, *1a*, and the bracket, C, and preferably carries the weight of the shaft, *1*.

The middle portion of the shaft, *1*, is formed with threads, *1d*, extending from near the top of the shaft, *1* to a point just above the bracket D.

A traveling crosshead, *8*, having sleeves, *8a*, formed integral therewith, is mounted upon the supporting rods, B and B', so as to slide freely thereon, and the intermediate portion of the crosshead, *8*, has a bore in which the shaft, *1*, revolves.

The upper central portion of the crosshead, *8*, is channeled longitudinally and in the channel are slidingly mounted to members, *7—7*, of a split nut. The inner ends of the members, *7—7*, may be bored and threaded to fit the threads of the shaft, *1*, or the threads may be formed on one of such members alone. When in contact with the threads of the shaft, *1*, there is a space separating the inner ends of these members, *7—7*, on one side, and into this space projects a cam, *4a*, formed upon the head of the lever or handle, *4*, which is pivotally mounted in a sleeve, *8b*, formed integral with the crosshead, *8*.

The head of the handle, *4*, is grooved and secured in place in the sleeve, *8b*, by a pin, *5*, which passes through a bore formed in the sleeve, *8b*.

A cover plate, *2*, having a central opening through which the shaft, *1*, may pass, may be secured to the top of the upper middle portion of the crosshead, *8*, by screws or other suitable means.

The split nuts, *7—7*, are acted upon by a spring, *3*, the ends of which bear against the outer ends of the split nuts and exert pressure on them toward the shaft, *1*.

The spring, *3*, may be formed semi-rectangular in shape to adapt it to the shape of the crosshead, *8*, and it may be turned in any desirable direction, but we prefer to have it extend forwardly and downwardly as shown in Figures 6 and 9.

One end of the crosshead, *8*, is extended laterally and bored and threaded to receive one end of the carrier rod, *9*, upon which is slidingly mounted a yoke, *11*, comprised of two end bars bored and slidingly mounted upon the rod, *9*, and a crossbar, *10*, which may be secured to the lower end of the bars, *11*, in any desired manner.

A carrier chain, *10a*, has a ring at one end which is slidingly mounted upon the bar, *10*, and to the lower end of the chain, *10a*, is attached the neurocalometer or any other apparatus which it is desired to have the carrier support and carry.

In Figure 1 we have shown the supporting bars, B and B', rigidly secured in a vertical position. In many cases it is desirable to permit the supporting bars to be tilted and in such cases, instead of having the supporting bars rigidly united to the base, we mount a supporting tube or column, *16*, rigidly in the base, A, and at the top of the column, *16*, we mount a cap or bracket, *16*, with an upwardly extending portion planed off to form two parallel faces.

A crossbar, G, having a yoke, G', formed integral therewith, is pivotally mounted upon the cap, *17*, by a bolt, *15*, which extends through the flanges, G', and the upper portion of the cap, *17*.

A manually operable sleeve, *14*, threaded to fit the bolt, *15*, is mounted upon the bolt with a wheel formed integral with the outer end thereof, by which the sleeve, *14*, can be readily tightened upon the bolt, *15*. Suitable washers, G'', may be interposed between the flanges, G', and the planed surfaces of the cap, *17*, to avoid the necessity for oiling, or to increase joint friction.

The rods, B and B', in this form extend through suitable bores in the crosshead or plate, G, and the shaft, *1*, likewise extends through a suitable bore therein. Upon the lower ends of the supporting rods, B and B', we mount a supporting bracket, E, which carries the motor, F, and gear housing, G.

The upper ends of the supporting rods are mounted in the cap plate, C, as heretofore described, and the supporting rods, B and B', carry the crosshead, *8*, the same as in the form of our machine heretofore described.

In the operation of our device, when applied in the ordinary manner by chiropractors, the apparatus is placed so that the carrier rod, *9*, will extend transversely of the back of the patient parallel with the patient's back. The crosshead, *8*, is then set at the desired height so as to bring the neurocalometer, suspended by the chain, *12a*, to the lower end of the patient's spine. The motor is then started and as it slowly revolves the shaft, *1*, the crosshead, *8*, is driven upwardly, and the carrier rod, *9*, being rigidly secured thereto, is carried upwardly at the same rate.

As the yoke, *11*, is freely slidable upon the rod, *9*, and as the chain, *10a*, provides flexibility, the neurocalometer may be guided laterally by the hand of the operator to keep it properly centered over the median line of the spine under examination.

The shaft, *1*, is made long enough to permit the full length of travel necessary for a patient of any height.

The neurocalometer being suitably connected to scribing means applied to a moving, graduated record sheet driven at a uniform speed not necessary to describe here, it is obvious that the graph produced by such scribing means will give a correct indication of the relative positions vertically along the spine, of the areas where the variations in temperature are found.

In our apparatus, we prefer to use a motor so designed that with the character of electric current available, it will operate at a certain predetermined speed at all times.

With such a motor, it is obvious that graphs made from the same patient at different times, assuming that the neurocalometer is properly adjusted and applied at the same point initially in each case, will afford ready means of comparing temperature variations at identical points along the spine at such times. In this way, a graph taken on one day may be accurately compared with a graph taken days, weeks or months previously or subsequently, and the progress of the patient readily noted therefrom.

We do not limit our apparatus to the precise forms shown, as it is obvious that various modifications thereof may be made without departing from the spirit of our invention, nor do we limit our invention to use by chiropractors only, for it is obvious that applications may be found for it in other fields where it will prove valuable.

In the selection of a proper motor to drive our apparatus, we prefer to utilize a reversible motor which will run in either direction, and also to use a motor of such low power that no automatic stops or cutouts are necessary.

A motor of approximately one-fiftieth horsepower will ordinarily be ample to operate our mechanism, and such a motor will stall at the end of the travel of the crosshead without danger of breaking the apparatus, but if desired, any of the automatic stops or cutouts which are well known and in common use may be applied to the motor.

In Figure 1 we have shown the shaft, 1, with an unthreaded portion at the top thereof long enough to permit the crosshead, 8, to clear the threads, 1d, when the crosshead reaches its extreme upward travel.

We claim:

1. An apparatus for impelling and timing recording neurocalometers, comprising a pair of vertical, parallel supporting rods united at both ends, a threaded shaft rotatably mounted parallel to the rods, a crosshead slidingly mounted upon the rods and means mounted upon the crosshead to engage the threaded shaft and be driven longitudinally of the rods thereby, a carrier rod united to and extending laterally from the crosshead, and means freely movable pivotally and slidingly on the carrier rod to suspend a neurocalometer therefrom.

2. An apparatus for impelling and timing recording neurocalometers, comprising a base having a pair of vertical parallel supporting rods mounted thereon, a threaded shaft rotatably mounted parallel to the rods, a crosshead slidingly mounted upon the rods and means mounted upon the crosshead to engage the threaded shaft and be driven longitudinally of the rods thereby, a carrier rod united to and extending laterally from the crosshead, and means pivotally and slidingly mounted on the carrier rod to suspend a neurocalometer therefrom upon which it may be manually guided laterally while traveling vertically.

3. An apparatus for impelling and timing recording instruments, comprising a pair of vertical, parallel supporting rods united at both ends, a threaded shaft rotatably mounted parallel to the rods, a crosshead slidingly mounted upon the rods and means mounted upon the crosshead to engage the threaded shaft and be driven longitudinally of the rods thereby, a carrier rod united to and extending laterally from the crosshead, and slidable means pivotally mounted on the carrier rod to carry a neurocalometer therefrom and permit manual lateral guidance thereof during its vertical travel.

4. An apparatus for impelling and timing recording neurocalometers, comprising a pair of parallel, supporting rods united at both ends, a threaded shaft rotatably mounted parallel to the rods, a crosshead slidingly mounted upon the rods and means mounted upon the crosshead to engage the threaded shaft and be driven longitudinally of the rods thereby, a carrier rod united to and extending laterally from the crosshead, and means manually movable laterally and pivotally and slidingly mounted on the carrier rod to carry a neurocalometer suspended therefrom.

5. An apparatus for impelling lengthwise of the spine and timing recording neurocalometers comprising a pair of vertical parallel supporting rods united at both ends, a threaded shaft rotatably mounted parallel to the rods, a crosshead slidingly mounted upon the rods and means mounted upon the crosshead adapted to engage the threaded shaft and be driven longitudinally of the rods thereby, a carrier rod united to and extending laterally from the crosshead, and a laterally adjustable yoke pivoted on the carrier rod to suspend a neurocalometer therefrom and permit free manual guidance thereof laterally of the spine, during its travel along the spine.

6. A uniform-speed impelling apparatus for temperature recording instruments, comprising a base, a supporting column united thereto, a bracket pivotally mounted upon the free end of the supporting column, a pair of supporting rods rigidly secured in the bracket and tiltable therewith, a threaded shaft rotatably mounted parallel with the supporting rods, a crosshead slidingly mounted upon the supporting rods and carrying a threaded member adapted to engage the threads of the shaft and to be driven thereby, and means for rotating the shaft at uniform speed.

7. A uniform-speed impelling apparatus for temperature recording instruments, comprising a base, a supporting column united thereto, a bracket pivotally mounted upon the free end of the supporting column, a pair of supporting rods rigidly secured in the bracket and tiltable therewith, a threaded shaft rotatably mounted parallel with the supporting rods, a crosshead slidingly mounted upon the supporting rods and carrying a threaded member adapted to engage the threads of the shaft and to be driven thereby, means for rotating the shaft at uniform speed, and means for engaging or disengaging the threaded member and the shaft.

8. A uniform-speed impelling apparatus for temperature recording instruments, comprising a base, a supporting column united thereto, a bracket pivotally mounted upon the free end of the supporting column, a pair of supporting rods rigidly secured in the bracket and tiltable therewith, a threaded shaft rotatably mounted parallel with the supporting rods, a crosshead slidingly mounted upon the supporting rods and carrying a threaded member adapted to engage the threads of the shaft and to be driven thereby, means for rotating the shaft at uniform speed, and spring-actuated means for engaging the threaded member with the shaft and manually operable means for disengaging them.

9. An apparatus for impelling and timing recording neurocalometers, comprising an extended vertical support, a threaded shaft rotatably mounted parallel to the support, a crosshead slidingly mounted upon the support, and means mounted upon the crosshead adapted to engage the threaded shaft and be driven longitudinally of the support thereby, a carrier rod united to and extending laterally from the crosshead, and means pivotally and slidingly mounted on the carrier rod to carry a neurocalometer suspended therefrom and to permit free manual lateral guidance of such neurocalometer during its vertical travel.

10. A uniform-speed impelling apparatus for temperature recording instruments, comprising a base, a supporting column united thereto, a bracket pivotally mounted upon the free end of the supporting column, a pair of supporting rods rigidly secured in the bracket and tiltable therewith, a threaded shaft rotatably mounted parallel with the supporting rods, a crosshead slidingly mounted upon the supporting rods and carrying a threaded member adapted to engage the threads of the shaft and to be driven thereby, a carrier rod united to and extending laterally from the crosshead, a laterally adjustable yoke pivoted on the carrier rod to suspend a neurocalometer therefrom and permit free manual guidance thereof laterally of the spine during

its travel along the spine, and means for rotating the shaft at uniform speed.

11. In an apparatus for impelling and timing recording neurocalometers, a base, a pair of vertical supporting rods and a rotatable threaded shaft mounted in the base, a crosshead slidingly mounted upon the supporting rods and a threaded member mounted upon the crosshead to engage the threaded shaft and to be driven longitudinally of the rods thereby.

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