Jan. 12, 1954 H. M. CUNNINGHAM 2,665,489

ADJUSTING DEVICE

Filed Oct. 22, 1949

Fig.1.

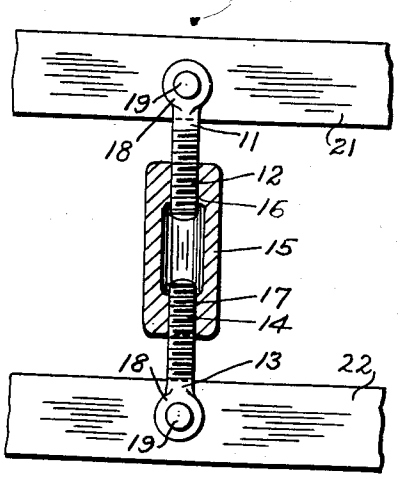


Fig.2.

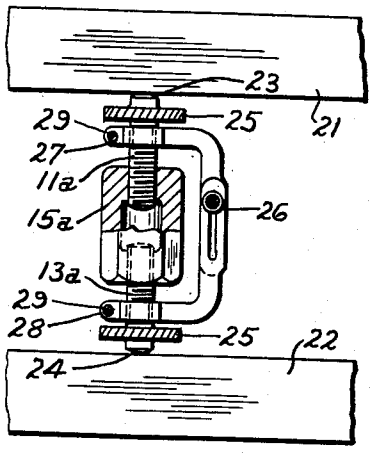


Fig.3.

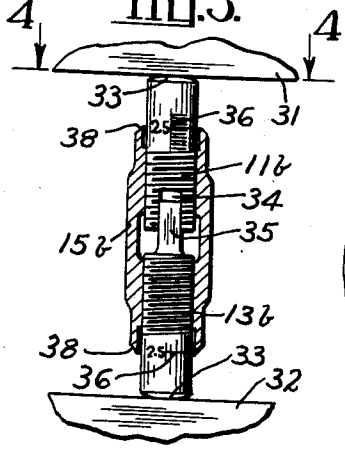


Fig.5.

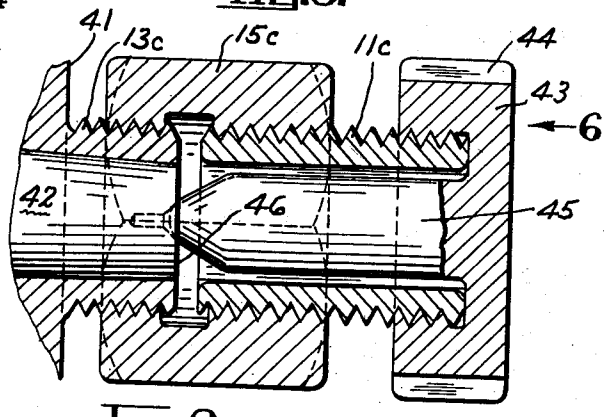


Fig.4.

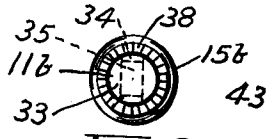


Fig.6.

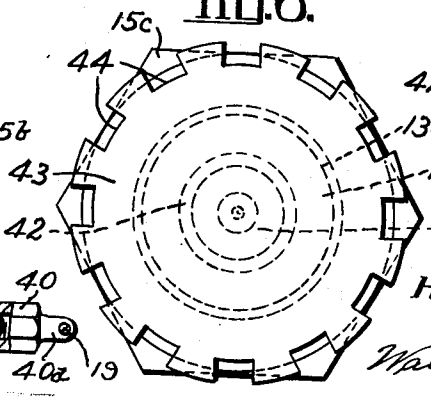


Fig.7.

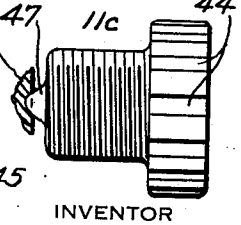
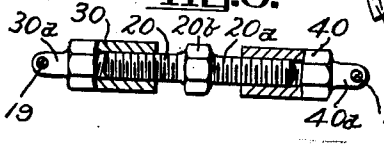


Fig.8.



INVENTOR

Hal M. Cunningham.

BY

Walter S. Edwards.

ATTORNEY

Patented Jan. 12, 1954

2,665,489

UNITED STATES PATENT OFFICE

2,665,489

ADJUSTING DEVICE

Hal M. Cunningham, Branford, Conn., assignor, by decree of distribution, to Helen M. Cunningham and Jeanne L. Cunningham

Application October 22, 1949, Serial No. 123,005

2 Claims. (Cl. 33—164)

1

This invention relates to adjusting devices and more particularly to an adjusting device capable of providing extremely fine adjustments and/or very powerful adjusting movements.

The invention primarily consists in the provision of two screw threaded spindles, the screw threads on one being of less pitch than those on the other but of the same hand, that is, both right hand, or both left hand, threads, and a sleeve-like member which is threaded internally to receive one of the spindles at each end thereof. Such a device has many practical uses, four of which are shown in the accompanying drawings and described hereinafter.

One object of this invention is to provide an adjusting device whereby extremely fine adjustments may be made, and/or very powerful adjusting movements may be obtained.

Another object is to provide an adjusting device of the above nature whereby two members may be finely adjusted toward and/or away from each other.

Another object is to provide an adjusting device of the above nature capable of very accurately indicating by delicate adjustment of its parts the amount two surfaces are separated from each other.

Still another object is to provide an adjusting device of the above nature capable of producing very forceful pressure, or pull, upon one member to separate it from, or move it toward, another member.

A further object is to provide an adjusting device which will be relatively inexpensive to manufacture, simple in construction, of a minimum number of parts, compact, convenient and practical in use, and very efficient and durable in use.

With the above and other objects in view, which will appear as the description proceeds, there has been illustrated in the accompanying drawings one form of device in which the features and principles of this invention may be conveniently and practically embodied.

In the drawings:

Figure 1 is a longitudinal sectional view of an adjusting device embodying the features and principles of this invention;

Figure 2, is a broken longitudinal sectional view of an adjusting device embodying the features and principles of this invention;

Figure 3, is a longitudinal sectional view of an adjusting device embodying the features and principles of this invention;

Figure 4, is a top view of the device shown in Figure 3 looking in the direction of arrows 4 in Figure 3;

2

Figure 5, is a longitudinal sectional view of an adjusting device embodying the features and principles of this invention;

Figure 6, is an end view looking in the direction of arrow 6 in Figure 5;

Figure 7, is a side view of a modified form of part for use with the device shown in Figure 5;

Figure 8, is a side view of a modified form, similar to Figure 1, partly in section.

Referring now to the drawings in which like reference numerals indicate like parts throughout the several views, the reference numeral 11, see Figure 1, denotes a screw-threaded spindle having an end portion 12 threaded with right hand threads. The numeral 13 denotes a screw-threaded spindle having an end portion 14 threaded with right hand threads. In accordance with a feature of this invention the threads on one spindle, 13, are of finer pitch than the threads on the other spindle, 11. A sleeve 15, internally threaded at 16 to receive the spindle 11 and at 17 to receive the spindle 13, has the threaded end portions 12 and 14 screwed thereinto. In this instance, the outer unthreaded ends 18 of each spindle is in the form of an eye to receive studs 19 extending one from each of spaced apart members 21 and 22.

The adjusting device comprising the spindles 11 and 13, and the sleeve 15, is used to adjust the spacing between the members 21 and 22 by first rotating the spindles in the sleeve until the eye ends 18 will slip over the studs 19. Fine adjustment of such spacing is then obtained by rotating the sleeve 15, the engagement of the eye ends 18 with the studs 19 preventing the spindles from turning. The difference in pitch of the threads on the spindles 11 and 13 result in very fine adjustment of the space between the members 21 and 22. For instance, should it be desired to increase the space, of say 2.000 inches, between the opposing surfaces of the members 21 and 22 to approximately 2.003 inches and the pitch of the threads on the spindle 11 is 32 per inch and the pitch of the threads on spindle 13 is 36 per inch, the sleeve 15 is turned one complete revolution resulting in approximately .003 inch separating movement between the members 21 and 22. The members 21 and 22 may be drawn toward each other in the same manner.

Another application of the above described principles of this invention is illustrated in Figure 8. In this instance the spindles 20 and 20*a* are joined together intermediate their ends preferably by a portion 20*b* hexagonal in cross-section and thus adapted to be turned by a wrench. The threads on one spindle are of smaller pitch than

those on the other. A sleeve 30 internally threaded to fit the threads on the spindle 20 has a lug 30a adapted to be slipped over the stud 19, see Figure 1. A sleeve 40 internally threaded to fit the threads on the spindle 20a has a lug 40a adapted to be slipped over the stud 19, see Figure 1. Adjustment of the sleeves 30 and 40 on the respective spindles 20 and 20a are first made and the lugs slipped over the studs 19. Fine adjustment is then obtainable by turning the spindles in unison by means of a wrench applied to the hexagonal portion 20b connecting the spindles 20 and 20a.

Still another application of the above described principles of this invention is illustrated in Figure 2. In this instance the spindles 11a and 13a are provided with ends 23 and 24, respectively, to engage the opposing surfaces of the members 21 and 22. Adjacent each spindle end 23 and 24 a knurled thumb and finger engaging collar 25 is provided whereby to turn the respective spindle. The sleeve 15a is formed from hexagonal stock whereby a wrench may be applied thereto to turn it. The threaded end of the spindle 11a has right hand threads of a desired pitch and the threaded end of the spindle 13a has right hand threads of a lesser pitch than that of the threads on spindle 11a.

In this instance, a device, adapted to be slidably elongated is provided, a screw 26 being provided to hold the two parts together. Ends 27 and 28 of this device are provided with clamp means whereby they can be clamped to the spindle 11a and 13a, respectively, to prevent relative movement therebetween. In the clamping arrangement shown the clamping ends 27 and 28 are not threaded but are clamped directly upon the threads on the spindles 11a and 13a by means of clamp screws 29. Adjustment of the space between the members 21 and 22 is first obtained, more or less roughly by loosening the clamp screws 29 and then rotating the spindle 11a and/or spindle 13a while holding the sleeve 15a. The clamp screws 29 are then tightened and the sleeve 15a is turned while holding the spindles 11a and 13a to obtain the desired fine adjustment.

The application of the features and principles of this invention are shown in Figures 3 and 4 embodied in a device to measure the spacing between spaced apart opposing surfaces 31 and 32. In this instance threaded spindles 11b and 13b are used which have screw-threaded ends adapted to be screwed into opposite ends of an internally threaded sleeve 15b. Each spindle has an outer end 33 for engagement with one of the opposing surfaces. To prevent relative movement between the spindles one of them, spindle 11b, has a groove 34 in its inner end to receive a tongue 35 extending from the inner end of the spindle 13b. Graduations 36 are etched on the periphery of one or both of the spindles 11b and 13b and graduations 37 are etched on the inclined ends 38 of the sleeve 15b.

The device illustrated is for measuring a hole, or space, 2½ inches, in diameter, or width, thus the zero line at each end of the sleeve 15b on the spindles is marked 2.5. Graduations 36 above and below the line marked 2.5 will indicate the actual amount between the opposing surfaces 31 and 32 after adjustment of the outer ends 33 by turning the sleeve 15b simultaneously on the spindles 11b and 13b.

In the application of the features and principles of this invention shown in Figures 5 and 6 one of the spindles 13c comprises the threaded hub portion of a wheel 41 mounted upon a tapered shaft 42. The other spindle 11c is in the form of a sleeve tightly threaded into a cap 43 having notches 44 in its periphery to receive the fingers of a spanner wrench (not shown). An internally threaded piece of hexagonal stock forms the sleeve 15c of this device. A stem 45, formed integral with the cap 43 extends from its inner surface through the spindle 11c toward and into contact with the outer end 46 of the wheel shaft 42. By turning the cap 43 and with it the stem 45 to cause the spindle 11c to enter the sleeve 15c until the stem 45 is in tight engagement with the shaft end 46, and then holding the wheel 41 and the cap 43, and with the cap 43, the stem 45 and the spindle 11c, while turning the sleeve 15c, will cause an exceedingly great pulling force to be applied to the wheel 41 through its threaded hub, or spindle 13c, whereby the wheel 41 may be readily pulled from the shaft 42. By using 10 pitch threads on the spindle 11c and 10½ pitch threads on the spindle 13c a pull force of approximately 100 tons can be applied. If desired the spindle 11c could be made integral with the cap 43 and have its inner end, or a nubbin 47, extended to engage the shaft end 46, see Figure 7.

While there have been shown and described herein several applications of the features and principles of this invention, it is to be understood that the said features and principles may be embodied in other specific devices without departing from the spirit and essential attributes of this invention, and it is therefore desired that the present shown applications be considered in all respects as illustrative and not restrictive, reference being had to the claims rather than to the foregoing description to indicate the scope of the invention.

Having thus fully disclosed the invention, what is claimed as new and for which it is desired to secure Letters Patent, is:

1. In an adjusting device, a sleeve having open ends threaded internally, a spindle having a threaded end receivable in one end of said sleeve, another spindle having a threaded end receivable in the other end of said sleeve, the threads on one spindle being of different pitch than the threads on the other spindle but of the same hand, the spindle ends within said sleeve being in opposed relation, one of said opposing spindle ends having a cross-slot therein, the other of said spindle ends having a tongue spaced inwardly from said sleeve and extensible into the cross-slot of the first mentioned spindle end to prevent relative rotative movement of said spindles, and comparable indicia on one of said spindles and the adjacent end of said sleeve to indicate the amount of movement of said spindle when the sleeve is rotated thereon.

2. In a device such as described, a sleeve having open ends threaded internally, a spindle having a threaded end receivable in one end of said sleeve, another spindle having a thraded end receivable in the other end of said sleeve, the threads on one spindle being of different pitch than the threads on the other spindle but of the same hand, the spindle ends within said sleeve being in opposed relation, one of said opposing spindle ends having a cross slot therein, the other of said spindle ends having a tongue spaced inwardly from said sleeve and extensible into the cross slot of the first-mentioned spindle end

to prevent relative rotative movement of said spindles, and comparable indicia on one of said spindles and the adjacent end of said sleeve to indicate the amount of movement of said spindle when the sleeve is rotated thereon, said indicia on the spindle comprising a series of graduations arranged longitudinally of the spindle, said indicia on the sleeve comprising a series of graduations arranged circumferentially of the sleeve.

HAL M. CUNNINGHAM.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
778,889	Plowden	Jan. 3, 1905
803,565	Dina	Nov. 7, 1905
1,161,406	Nilson	Nov. 23, 1915
1,394,691	Spence, Jr.	Oct. 25, 1921
1,681,565	Achenbach	Aug. 21, 1928
1,901,286	Coe	Mar. 14, 1933
2,278,320	Kath	Mar. 31, 1942
2,352,585	Camburn	June 27, 1944
2,485,280	Grace	Oct. 18, 1949

FOREIGN PATENTS

Number	Country	Date
197,217	Great Britain	May 10, 1923
465,297	France	Apr. 11, 1914