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P. GARDNER

2,074,107

ADJUSTABLE FASTENING DEVICE

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Fig. 1.

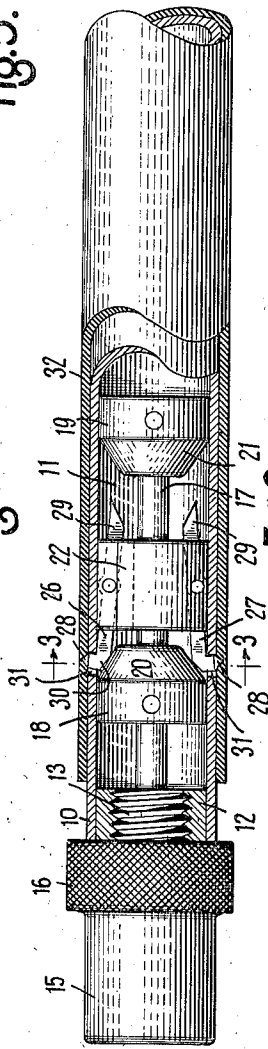


Fig. 2.

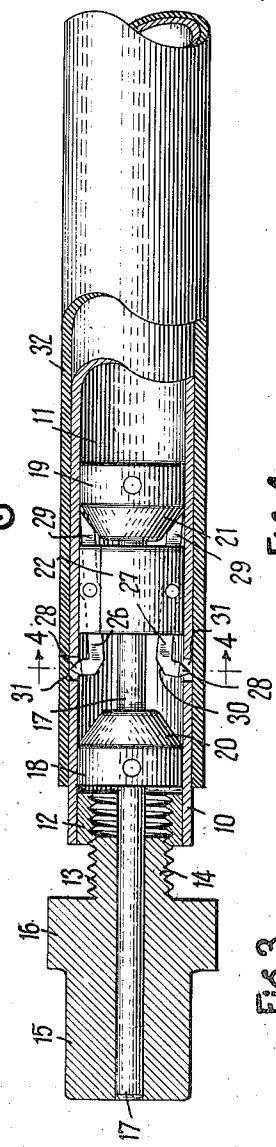


Fig. 3.

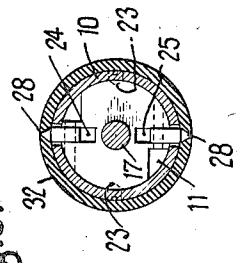
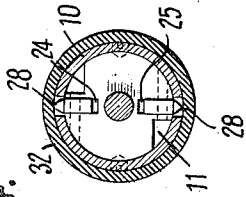
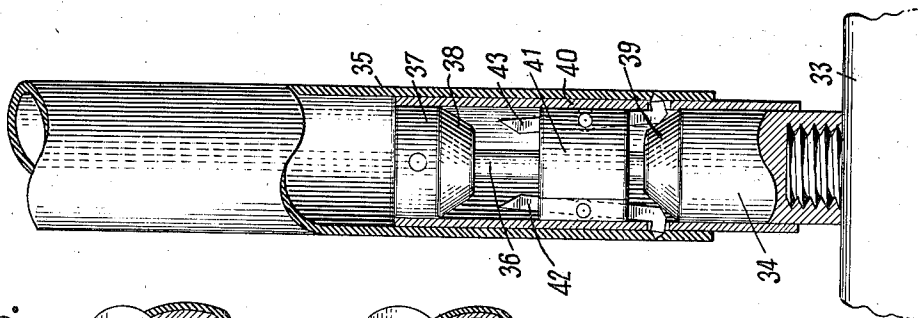


Fig. 4.



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ADJUSTABLE FASTENING DEVICE

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1 Claim. (Cl. 287—119)

This invention relates to new and useful improvements in an adjustable fastening device and is particularly adapted to fastening tubular elements such as cores, shells and shafts to supports.

A main object of the invention is to provide simple and efficient means whereby a tubular element may be quickly and easily attached to and removed from a support whether the support is a fixed or a rotatable support.

A further object is to provide simple and efficient means whereby the attachment to and removal from the support can be effected by an extremely simple and effective operation requiring a minimum of time and effort on the part of the operator.

A further object is to provide simple and efficient means whereby tubular sleeves can be slipped on to rotatable supports and fastened thereto for rotation especially in the arts involving rolling or winding up of material on said cores or shells.

Further and more specific objects, features and advantages will more clearly appear from a consideration of the specification hereinafter when taken in connection with the accompanying drawing which forms part of the specification and which illustrates a present preferred form of the invention.

In the general contemplation of the invention I provide a support which may be a fixed support or a rotatable support and within this support there is disposed a movable element which I call the operating element and which in its movement cooperates with latching elements which can be projected through suitable holes in the support or retracted in order to grip or contact with the inner surface of a tube or shell which is to be disposed over the support and to be held thereon. In a particular form of the invention I provide an operating element which is movable along the axis of the support and provided with wedge shaped surfaces adapted in the movement to cooperate with pivoted latch members having suitable latched teeth thereon whereby the movement of the operating element in one direction will actuate said levers to project the latching teeth through the holes to make contact with the tubular element to be fastened and when its movement is in the opposite direction will positively engage the latch levers or bars to direct the teeth from the element to be fastened. The operating element may be manipulated either by the actuation or turning of a member or by direct pushing or pulling action.

In the textile industry it is necessary to roll or wind up material on rotating spindles or shafts. When this is required it becomes necessary to slip a tube or a sleeve over the shaft so that the material can be wound up on this sleeve and can be readily slipped off the shaft with the wound up material when the operation is completed. However, in order to effect the winding up, the sleeve during this operation must be positively fastened to the rotating shaft and for this reason this simple invention has been developed. A similar condition is met with in the spinning industry where the tubes or cores on which the spun material is wound up must be capable of ready insertion on or removal from rotating supports such as the spindles of spinning machines.

In a more particular form of the invention I provide a hollow chamber in a portion of the main shaft and in this chamber I insert a bar having thereon elements with oppositely disposed conical wedge surfaces facing each other. Between these conical surfaces I dispose an element fastened to the inner surface of the hollow shaft. This element moves along the rod and has pivoted levers. On one end of these levers is disposed latch teeth to be projected through holes in the hollow shaft as the rod is moved in one direction the engagement of one conical surface with the adjacent ends of the latch levers will spread these lever ends and project the teeth through the holes, whereas a movement of the rod in the opposite direction will spread the other ends of the levers but will contract the toothed ends and thus withdraw the teeth from their engagement with a shell or tube slipped over the main hollow shaft. This rod which is one portion of the operating element may be operated either by a threading action or by a direct pushing-pulling action.

The preferred present form of the invention shown in the drawing of which

Fig. 1 is a partial side elevation of the device with the parts in the operative position and with certain portions in section;

Fig. 2 is a similar view showing the parts in the inoperative position;

Fig. 3 is a cross section taken on the line 3—3 of Fig. 1;

Fig. 4 is a cross section taken on the line 4—4 of Fig. 2; and

Fig. 5 is an elevation partly in section of a modified form of the device showing the parts in operative position.

The form of the invention shown in Figs. 1 to 4 is especially adaptable where it is desired to fas-

ten to a shaft, a covering on which material is to be wound in a roll and to enable the covering with the roll of material thereon to be slipped off the shaft after the rolling operation is completed.

5 This is especially useful in the rolling or winding up of textile fabrics and has been successfully used in winding up cloth for use as bias binding material.

The form of the invention shown in Fig. 5 is a modified form of the invention especially adaptable for use in connection with apparatus such as spinning machines in connection with the ready removal and insertion of spinning core or tubes from their supports.

10 In the form of the invention shown in Figs. 1 to 4 inclusive, there is shown a shaft 10 provided with a hollow chamber at least along one end thereof. Into the end of this shaft a plug 12 is inserted with a snug tight fit and this plug has interior threads engaging with exterior threads 13 formed on the forward end 14 of a hand bushing 15 having an enlarged knurled portion 16 to enable it to be readily turned by the hand.

25 A rod 17 is snugly fitted in a bar within the member 15 and extends well into the chamber 11. On this rod 17 at spaced points thereon are fastened plug members 18 and 19 slidable with the rod within the hollow shaft 10. The adjacent 30 faces of these plugs are formed as partly conical surfaces 20 and 21. Slidable on the rod 17 between the fixed plugs 18 and 19 is a cylindrical plug 22 which is fastened to the shaft 10 by means of screws 23.

35 The plug 22 provided with longitudinal slots 24 and 25 in which are pivoted latch bars 26 and 27 which extend at each end beyond the opposite ends of the plug 22. One end of each of these latch bars is bent outwardly to form a tooth 40 28 and the other end of each latch bar is bevelled as at 29 to engage with the adjacent surface of the plug 19. The other end portions of the latch bars are also bevelled as at 30 to permit a slidable engagement with the conical face 45 20 of the plug 18.

Adjacent the teeth 28, the shaft 10 is provided with holes 31 extending therethrough. By turning the flange 16 the extension 14 is threaded into and out of the plug 12 thus moving the rod 17 in one direction or another. It will be seen that when this movement is to the extreme left the conical surface 21 will separate the adjacent ends of the latch bars and retract the teeth 28. By a movement of the rod in the opposite direction to the extreme end of its movement will cause the engagement of conical surface 20 with the ends of the latch bars to move the teeth through the hole 31 into contact with the inner surface of a cover or sleeve 32 which can be and is slipped over the shaft 10. In this operative position of the part shown in Fig. 2, the teeth will therefore grip the sleeve 32 and hold it on the shaft 10 but this sleeve is released from the teeth upon the opposite motion of the rod 17.

65 In the form shown in Fig. 5 a fixed support 33 is shown and on this support is mounted the plug 34 which may be connected with the support either as a stationary member or may be in any manner connected to be rotated in a spinning machine as a spindle or rotating support 70 for a spinning core or tube which is represented by the hollow cylindrical shell 35 but which may be of any other shape than the one shown in this figure. The rod 36 extends upwardly from the 75 plug 34 and on its upper end has a plug 37

fastened thereon with a lower conical face 38 facing toward the upper conical face 39 of the plug 34. A sleeve or hollow shaft 40 surrounds the plug 37 and the plug 34. A cylindrical plug 41 is slidable on the rod 36 between the plug 34 and the plug 37 and is fastened by screws to the hollow shaft 40 in the manner previously described with respect to the other figures. This is also in a similar manner provided with two latch bars 42 and 43 having bevelled ends and 10 having teeth on one end adaptable to be retracted and projected through holes in the shaft 40 in order to engage the inner surface of the spinning tube or core 35.

The parts shown in Fig. 5 are in their engaged 15 position. In order to remove the core 35, it is merely necessary to raise the core whereupon this snug fit of the core 35 with the shaft 40 will lift the shaft 40 and with it plug 41. This movement will continue until the bevelled upper end 20 of the latch bars engage the core 38 whereupon the teeth will be withdrawn and the upward movement of the shaft 40 will stop allowing the core 35 to be removed therefrom.

When it is desired to place the core 35 on to 25 the support it is merely necessary by the hand to raise the shaft 40 by grasping it and lifting it until the teeth retract whereupon the core can be slipped down over the shaft 40 to the desired position shown and then the core 35 30 and the shaft 40 are allowed to move to the lower position shown in Fig. 5 in which position the core 35 is engaged by the teeth and rotated with the shaft 40.

It will therefore be seen that I have pro- 35 vided a simple and efficient durable device to enable tubes, shells, cores and the like to be quickly and easily fastened to desired supports whether those supports are rotating or stationary. This attachment is effected by turning a 40 threaded member in one direction or another or by the simple axial movement of an element in one direction or the other. The latching action is effected by the spreading of toothed bars, by bevelled cams or wedges and a similar cam or 45 wedge action is effected to retract the latching member. The device is simple in construction, can be manufactured in a simple economical way and durable to withstand substantial continued use without deterioration.

While the invention has been described in detail and with respect to a present preferred form thereof it is not to be limited to such details and forms since many changes and modifications may be made in the invention without departing 55 from the spirit and scope of the invention in its broadest aspects. Hence it is desired to cover any and all forms and modifications of the invention which may come within the language or scope of the appended claim.

I claim:

60 An adjustable fastening device which comprises a tubular member having holes therein, a block fastened within said tubular member, pivoted latch bars on said block, teeth or projecting portions on one end of said bars and adapted to be 65 projected through the holes to engage with a sleeve slipped over the tubular member, a rod axially slidable within the tubular member and through a bore in said block, spaced blocks fastened to said rod on opposite sides of said fixed block and having wedge shaped surfaces disposed on adjacent faces, the ends of said latch bars being bevelled and adapted to be engaged by the 70 respective adjacent wedge shaped surface as the 75

rod is moved in one direction or another whereby the teeth on the bars will be projected or retracted to said holes, a plug fastened in the end of the tubular member and having an interior
5 threaded bore, and an operating bushing fastened to the projecting end of said rod and hav-

ing an exterior threaded portion to engage said threaded bore whereby the turning of said bushing in one direction or another will slide the rod axially in one direction or another.

PERCY GARDNER.