This invention relates to ceiling jacks and more particularly pertains to a lengthwise adjustable and spring pressed jack for holding building material against a ceiling.

Ceiling jacks and scaffolds have been employed heretofore to facilitate the application of building material to ceiling rafters such as sheet-rock and plywood board, however, the several devices of the prior art have not proven entirely satisfactory inasmuch as they are complicated in design and construction, expensive to manufacture, difficult to use and unsatisfactory in performance.

With the foregoing in view, the primary object of the invention is to provide a ceiling jack or jack assembly which is simple in design and construction, inexpensive to manufacture, easy to use, and easy to remove without spoiling the surface or marring the surface of the building material and which enables one man to do the work of several men thereby providing a great saving in man hours.

An object of the invention is to provide telescoping members wherein one member is fixedly adjustable relative to extension so as to determine the overall length of the jack.

An object of the invention is to provide a spring pressed telescoping member so as to provide a spring load on the jack urging the building material into fixed relationship with the ceiling rafters.

An object of the invention is to provide a set of two jack assemblies having an interconnecting foot bar so that the operator can use his foot to compress and load the spring.

An object of the invention is to provide ratchet means on the adjustable extension so that the extensions can be ratcheted easily outwardly to adjust the length of the jack.

An object of the invention is to provide a bar between two or more jack assemblies so that they can be extended at the same time with one motion.

An object of the invention is to provide a cross rod between the ratchet pawls so that the extensions can be released with one hand by the operator.

An object of the invention is to provide an interconnected group of four jacks so that they are capable of standing in vertical condition by themselves.

These and other objects of the invention will become apparent by reference to the following description of the ceiling jack embodying the invention taken in conjunction with the accompanying drawings in which:

Fig. 1 is a side elevational view of a single ceiling jack, partly in cross-section, shown disposed between a floor and a ceiling.

Fig. 2 is a cross-sectional view of the device seen in Fig. 1, slightly enlarged, taken on the line 2—2 thereof.

Fig. 3 is a cross-sectional view of Fig. 2 taken on the line 3—3 thereof.

Fig. 4 is a cross-sectional view of Fig. 2 taken on the line 4—4 thereof.

Fig. 5 is an end elevational view of two modified jack assemblies shown in interconnected relationship.

Fig. 6 is a side elevational view of two jack assemblies shown in interconnected relationship as seen from the side of Fig. 5.

Fig. 7 is a cross-sectional view of the ratchet extension portion of the jack assembly.

Fig. 8 is a cross-sectional view of a portion of Fig. 5 taken on the line 8—8 thereof showing the spring loaded leg portion thereof.

Fig. 9 is a cross-sectional view similar to Fig. 8 showing the spring loaded leg portion mounted directly in the tubular member constituting the riser to the ceiling.

Referring now to the drawings wherein like numerals refer to like and corresponding parts through the several views, the inventive jack comprises an intermediate section 10, adapted to telescope with other members at either end thereof, a spring pressed member 11 telescoping with the intermediate member 10, an adjustable extension member 12 telescoping with the roub of an aperture 49 and 51 in the intermediate section 10 and adapted to adjust the pre-set length of the device, and a spring 13 adapted to urge the intermediate member 10 and the spring pressed member 11 outwardly of each other providing means for the operator manually compressing the spring 13 to load the spring so that when the ceiling jack device is positioned underneath an element to be held against the ceiling rafters and the spring pressure released, the device is capable of spring pressing the building material 14 against the ceiling rafters 15 under the compression of the spring 13.

More particularly, the device seen in Figs. 1–4 comprises an intermediate tubular member 20 having an upper end 21 closed by a plug 22 and a lower end 23 having paired pin receiving apertures 24 formed therein. The upper end of the tube 29 is telescoped with the upper spring pressed sliding tube 25 which is equipped with a plug 26 and the spring 27 is disposed between the plugs 22 and 26 so as normally to urge the tubular members 20 and 25 apart and so that in use, the user can grasp the tubular member 25 and by pressing downwardly thereon compress the spring 27 between the plugs 22 and 26 so as to preload the spring; the top of the tube is fitted with a cap 28 which is fastened to a to a piece 29 which may be pivotally mounted as by one pin 30 or secured fixedly as by two pins 30 as desired. The bottom adjustable fixable extension member 31 is provided with paired spaced apertures 32 and the pin 33 is adapted to be received in the apertures 32 at 33 as adjusted by the user so as to determine the axial extent of the leg 31 relative to the intermediate tubular member 20 to determine the overall length of the device relative to the ceilings of various heights. The lower end of the tube may be closed as by the foot plug 34 which is preferably made of rubber so as to provide a non-skid base for the device.

Referring now to the device seen in Figs. 5–8, each intermediate member 10 comprises a tubular member 40 cross connected to the tubular member 41 via the straps 42 and 43 and the tubular member 41 comprises a spring receiving chamber having a closed top 44 for receiving the spring 45 and for telescoping receiving the leg 46 which abuts the spring 45. The pawl 48 is located at the upper end of each intermediate tubular member 40 and is adapted to communicate through the member 40 via the aperture 49 and the extension member 50 is provided with spaced apertures 51 between the ratchet teeth so that when the extension member 50 is telescoped at the upper end with the intermediate member 40; the pawl 48 disposed in the apertures 49 and one of the apertures 51 constitutes a lock in an inward direction between the members 40 and 50 for fixing the adjusted axial extension of the member 50 relative to the intermediate member 40, and, the pawl 48 and aperture 49
and 51 constitutes a by-pass ratchet in the outward direction of the extension member 50 relative to the intermediate member 49.

The collar 51 is provided with a yoke 52 to which the pawl is pivotally connected by the cross pin 53 and the spring 54 displaceably urges the pawl into engagement with the apertures 49 and 51. Yoked collars 56 are disposed at either end of the intermediate member 40 and the cross ties 57 and 58 are disposed between the collars 56 so as to provide linear crossed supports for the jack members 50.

The lower lateral foot cross bar 59 is disposed between the lower ends of the intermediate members 40, an upper hand cross bar 60 is disposed between the upper extension members 50, and the cross latch rod 61 is disposed between the paired paws 48 at either end of the device. A plywood sheet 62 is positioned across the top of the extension members 50 so as to provide a wide platform table for supporting the wall board 14 against the ceiling joist 15.

Fig. 9 shows a modification of the device seen in Figs. 5 and 6 wherein the leg 46 is directly telescoped in the tubular member 40 which is provided with a stop 70 abutting the spring 45 which is disposed between the stops 70 and the leg 46.

In the operation of the device seen in Figs. 1-4, the user adjusts the extension member 31 relative to the intermediate member 20 by removing the pin 33 and so indexing the spaced paired apertures 32 to the paired apertures 24 that the extension member 31 extends outwardly of the intermediate member 20 the desired distance calculated to integrate the device with an overall length higher than the ceiling relative to which it will be used when the spring 27 is not compressed so that when the spring 27 is compressed the device will be spring loaded so as to provide a spring pressure against the ceiling.

The user with one hand then places a piece of building material 11 against the ceiling joist 15 and compresses the spring 27 by grasping the upper telescoping member 14 and pulling downward thereon and then positioning the cross-piece 29 or head of the device under the building material and then releasing his grip on the upper member 25 outwardly of the intermediate member 20 so as to urge the cross piece against the rock latch 14 and in turn the rock latch against the ceiling joist 15 whereby the spring pressure holds the rock latch 14 in position while the user then moves the device outwardly of the intermediate member 20. After the rock latch has been nailed, the user removes the device by grasping the upper telescoping member 25 and compressing the spring and moving the head or cross piece 29 out of position below the rock latch and then repeats the operation until the ceiling has been lathed or other material placed in position.

Referring now to the operation of the device seen in Figs. 5-8 it will be understood that the initial position of the device is such that the table 62 is spaced well below the ceiling joist 15; the user then places a sheet of rock latch on the table 62 and then places his foot on the foot cross bar 59 and by placing weight thereon compresses the springs 45 and causes the extension legs 46 to telescope upwardly within the spring socket 41 so that the springs 45 are loaded so as to urge the intermediate member 10 in an upward direction. The user then with his hand grasps the cross bar 60 and pushes upwardly thereon causing the telescopic extension members 50 to move outwardly of the intermediate member 40 with the spring pressed pawl by passing the apertures 51 in this direction and when the one end of the device has been so compressed at the bottom and so extended at the top, the user permits the pawl 48 to seat in one of the apertures 51 thereby locking the device in the extended position whereupon he removes his foot from the foot cross bar 59 allowing the loaded springs to urge the device upwardly so as to position the rock latch 14 against the rafters 15.

In the event that two operators are using the device, each will operate his end of the device at the same time so as to effectively position both ends of the rock latch 14 at the same time. However, in the event that one man is operating the device, he operates one end of the device as described and then goes to the other end of the device and repeats the operation.

It can now be seen that the inventive jacks can be used individually or can be used in pairs or double pairs and it is obvious that (they) inventive jacks provide a compact, durable, neat appearing mechanism easily operated to secure a building element against a ceiling and it is further obvious that they are capable of permitting a single operator to position and secure building elements against a ceiling which otherwise would require at least two or more men thereby saving greatly on the cost of labor and permitting one man to do the work of two or more men.

Although the device has been described in conjunction with locating building material against the ceiling such as rock lath, it is obvious that furnace ducts, veneer board, pipes, and any other element desired to be positioned against a ceiling can be so located thereagainst with ease by one man.

Although both embodiments of the invention have been shown and described in detail, it is obvious that many changes may be made in the size, shape, detail, and arrangement of the various elements of the invention within the scope of the appended claims.

1. An adjustable height spring loaded ceiling support having two interconnected jack assemblies each comprising an intermediate member having one end adapted to telescope with a ratcheting extension member and another end adapted to telescope with a spring loaded leg, an extension member telescoping with one end of said intermediate member; ratchet teeth disposed on one said member and a ratchet pawl disposed on said other member; said ratchet teeth and pawl being so disposed that said members are free to ratchet axially outwardly of each other and to lock against axial inward movement of each other; said pawl being releasable to permit axially inward movement of said extension member; a spring disposed in the other end of said intermediate member, a stop in said intermediate member abutting said spring, a leg telescoping with said member abutting said spring to support said intermediate member via said spring, a foot cross bar between said intermediate members constituting a foot pad; said springs being compressed downwardly by an operator standing on said foot pads with said extension members being easily extensible upwardly to load a piece of building material adjacent a ceiling whereupon the operator stepping off said pad and said springs move said intermediate members upwardly to press the building material against the ceiling.

2. In a device as set forth in claim 1, a hand cross bar disposed between said extension members of said ceiling support constituting a handle so that an operator can extend both extension members at the same time with one hand.

3. In a device as set forth in claim 1, a hand release rod disposed between said paws so that an operator can release both paws at the same time with one hand.

4. In a device as set forth in claim 1, a hand release rod disposed between said paws so that an operator can release both paws at the same time with one hand.

5. An adjustable height spring loaded ceiling jack particularly suitable for holding building material against a ceiling having at least one immediate member having an upper end adapted to telescope with a top member, a bottom member on said intermediate member constituting a spring receiving chamber, a spring in said chamber, a leg telescoping in
said bottom member chamber abutting said spring so as to support said members via said spring, a top extension member telescoped with the upper end of said intermediate member; ratchet teeth on said top extension member, and a ratchet pawl on said intermediate member adapted to co-operate with said ratchet teeth so as to by-pass in an axially outwardly direction and to lock in an axially inwardly direction; said device being positionable below a ceiling and manually compressible against said spring in a downward direction so as to load same; said top extension member being outwardly ratchet-wise movable so as to position a piece of building material against a ceiling whereupon release of said spring allows said spring to force the building material in an upward direction into spring pressed engagement with a ceiling; said top extension member being retractable by releasing said pawl.

6. In a device as set forth in claim 5, brace means for supporting said jack assembly in a vertical position.

7. An adjustable height spring loaded ceiling support having two interconnected jack assemblies each comprising an intermediate member having an upper end adapted to telescope with a ratcheting top extension member, a bottom member on said intermediate member constituting a spring chamber and adapted to telescope with a spring loaded leg, a top extension member telescoping with the upper end of said intermediate member; ratchet teeth disposed on said top extension member and a ratchet pawl disposed on said intermediate member; said ratchet teeth and pawl being so disposed that said members are free to ratchet axially outwardly of each other and to lock against axial inward movement of each other; said pawl being releasable to permit axial inward movement of said extension member; a spring disposed in said bottom member, a stop in said bottom member abutting said spring, a leg telescoping with said bottom member abutting said spring so as to support said members via said spring, a cross bar between said intermediate members constituting a foot pad; said springs being compressed downwardly by an operator standing on said foot pad with said extension members being easily extensible upwardly to load a piece of building material adjacent a ceiling whereupon the operator stepping off said pad, said springs move said members upwardly to press the building material against the ceiling.

8. In a device as set forth in claim 7, a hand cross bar disposed between said top extension members of said ceiling support constituting a handle so that an operator can extend both extension members at the same time with one hand.

9. In a device as set forth in claim 7, a hand release rod disposed between said pawls so that an operator can release both pawls at the same time with one hand.

10. In a device as set forth in claim 7, two additional like jack assemblies; and links interconnecting all four jack assemblies so as to be self-supporting in vertical condition.

11. An adjustable height spring loaded ceiling support assembly having at least two interconnected jack assemblies each comprising an intermediate member having one end adapted to telescope with an adjustable extension second member and another end adapted to telescope with a spring loaded third member, an extension second member telescoping with one end of said intermediate member, means for axially adjusting and securing said extension member relative to said intermediate member, a spring disposed in the other end of said intermediate member, a stop in said intermediate member abutting said spring, a third member telescoping with said member abutting said spring so as to support said intermediate member via said spring, a cross bar between said intermediate members constituting a pad; said springs of both jacks being compressed downwardly by an operator pressing on said pad with said extension members being moved downwardly to load a piece of building material thereon adjacent a ceiling whereupon the operator releasing said pad, said springs move said members upwardly to press the building material against the ceiling.

12. In a device as set forth in claim 11, a hand cross bar disposed between said extension members of said ceiling support constituting a handle so that an operator can extend both extension members at the same time with one hand and a ratchet pawl means on said intermediate and extension members permitting ratcheting axial outward movement.

13. In a device as set forth in claim 11, a hand release rod disposed between said pawls so that an operator can release both pawls at the same time with one hand to permit axial inward movement.

14. In a device as set forth in claim 11, two additional like jack assemblies; and links interconnecting all four jack assemblies so as to be self-supporting in vertical condition.

References Cited in the file of this patent

UNITED STATES PATENTS

784,985 Caswell Mar. 14, 1905
1,229,976 Klais June 12, 1917
1,503,416 Tidyman May 13, 1919
1,563,924 Ruth Dec. 27, 1927
1,820,950 Schulstadt Sept. 1, 1931
2,164,609 Cusick July 4, 1939
2,273,813 Barber Feb. 24, 1942
2,285,901 Chenoweth June 9, 1942
2,332,240 Lavell Oct. 19, 1943
2,496,794 Hoch Feb. 7, 1950