June 12, 1956 C. W. ALDER 2,749,570

DUAL ACTION LIFT SPRING

Filed March 17, 1954

FIG. 2.

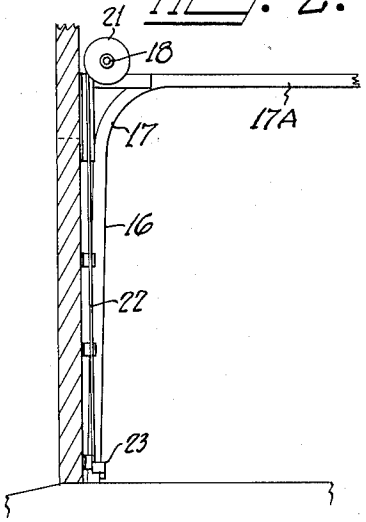


FIG. 1.

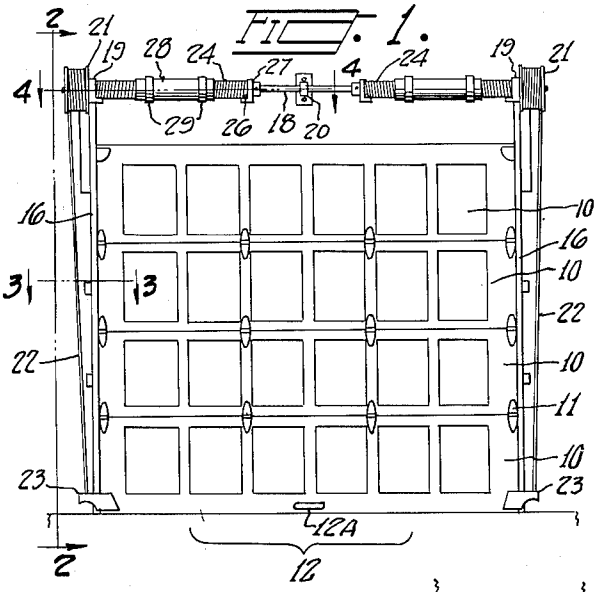


FIG. 4.

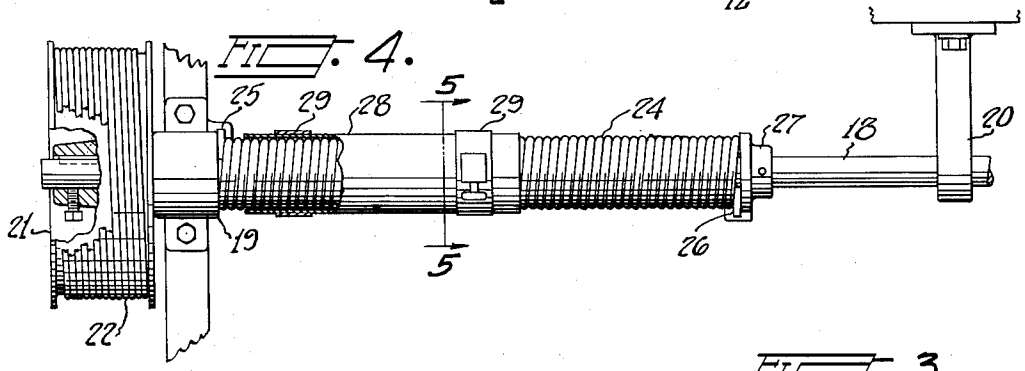


FIG. 5.

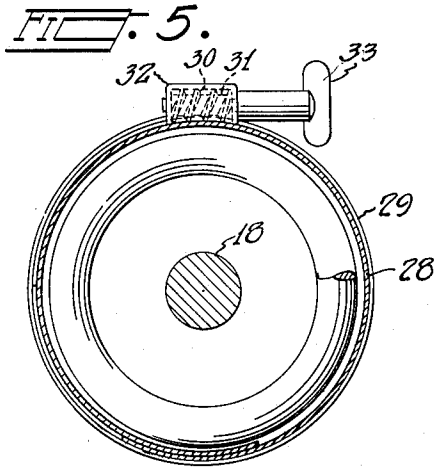
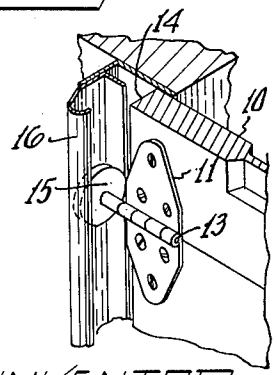


FIG. 3.



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DUAL ACTION LIFT SPRING

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Application March 17, 1954, Serial No. 416,866

2 Claims. (Cl. 16—198)

This invention relates generally to torsion springs and to mechanisms in which such springs constitute an element. It relates specifically to a dual action lift spring and also for providing a change in the action of the governing device in various parts of its movements.

The main object of this invention is to provide a clamp whereby a predetermined portion of a spring may be deprived of its action through all or a portion of the operating time of the remainder of the said spring.

The second object is to construct a torsional spring unit which can be made to meet a wide range of operating requirements without the need of changing the spring length, thereby saving the necessity of carrying an extensive stock of springs to meet the various requirements.

I accomplish these and other objects in the manner set forth in the following specifications as illustrated in the accompanying drawing, in which

Fig. 1 is an elevation of a lift door installation as viewed from the inside of a garage.

Fig. 2 is a section taken along the line 2—2 in Fig. 1.

Fig. 3 is a section taken along the line 3—3 in Fig. 1.

Fig. 4 is a fragmentary view taken along the line 4—4 in Fig. 1.

Fig. 5 is a section taken along the line 5—5 in Fig. 4.

There is shown by way of example a garage door installation in which a plurality of panels **10** are united by means of hinges **11** to form a complete door **12**. The hinge pins **13** of the hinges **11** nearest the door edges **14** are each provided with a roller **15** which rolls in an upright track **16** which is joined by a curved portion **17** with a horizontal track portion **17–A**. With this type of mechanism there is provided a single shaft **18** for each door **12**. The shaft **18** is provided with suitable bearings **19** and **20**.

On the outer end of each shaft **18** is secured a cable winding drum **21**, whose cable **22** is attached to an anchor **23** at a lower corner of the door **12**.

Power is applied to the drum **21** by an electric motor (not shown) either directly to the drum **21** or to the shaft **18** upon which the drum is secured, or it may be supplied manually through a handle **12–A** provided on the lowermost panel **10**.

Near each end of the shaft **18** is mounted a torsion spring **24** whose end **25** is attached to a bearing **19**, while

its end **26** is attached to an anchor collar **27** pinned on the shaft **18**.

When the door **12** is raised either manually or with power, the spring **24** turns the shaft **18**, which being in one piece, turns both of the drums **21** providing a uniform lifting effort at each lower corner of the door **12**.

The apparatus thus far disclosed is in common use.

Referring to my invention, it will be seen to consist of a sheet metal sleeve **28** placed over each spring **24**, and around each sleeve **28** are placed a plurality of band clamps **29** whose overlapping portions are perforated to receive the thread **30** of a worm **31** mounted in the housing **32** and turned by a key **33** by means of which pressure on the sleeve **28** can be controlled to a nicety.

This makes it possible to have the sleeve **28** somewhat loose at the beginning of the door travel and set tight enough so that it can catch the spring about midway of the door travel. The relative setting of the clamps **29** makes it possible to conrol the performance of the spring throughout its operation. It is desirable to provide a lubricant such as paraffin between the springs **24** and the sleeves **28**.

I claim:

1. In an overhead door lifting mechanism having a shaft with a cable drum adapted to make a plurality of revolutions in a door lifting movement, a torsion spring encircling said shaft and having one end anchored thereto, a flexible sleeve surrounding a portion of the length of said spring, and a pair of constricting clamping means operable on said sleeve at two axially spaced points, said clamping means being slidable toward and away from each other to vary the constricted length of said sleeve for adjusting the effective length of said spring at the end of the lifting movement of said shaft independent of the length of said spring at the beginning of the lifting movement of said shaft, and said clamping means being adjustable in diameter to vary the door position at which further expansion of the clamped length of said spring is prevented in a lifting movement.

2. In an overhead door lifting mechanism having a shaft with a cable drum adapted to make a plurality of revolutions in a door lifting movement, a torsion spring encircling said shaft and having one end anchored thereto, a flexible split sleeve surrounding a portion of the length of said spring, and a pair of band clamps on said sleeve, said clamps being slidable toward and away from each other to vary the effective spring length and provide fine adjustment of the spring force at the end of the lifting movement of said shaft independent of the spring force at the beginning of the lifting movement, and said clamps being adjustable in diameter to vary the door position at which further expansion of the adjusted length of spring between said clamps is prevented in a lifting movement.

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