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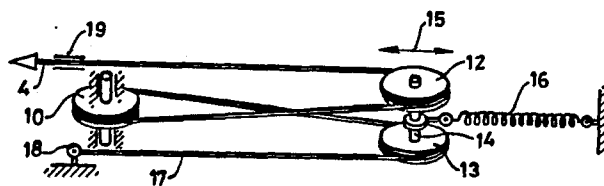
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⑤ Door spring.

⑤ Door spring, comprising at least three rotating pulleys (10, 12, 13) in an oblong housing (25) being movable jointly against spring force (16) in the longitudinal direction of the housing, and with a pull cord (4) guided over the pulleys (10, 12, 13) and taken out of the housing, the two jointly movable pulleys (12, 13) being coaxial and freely rotatable, the pin of the third pulley (10) being fixed in the housing (25), and the cord (4), starting from a fastening point (18) near the third pulley (10), being conveyed first over the first pulley (13), then over the third pulley (10), and subsequently over the second pulley (12), and taken out of the housing near the third pulley (10).



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Door spring.

The invention relates to a door spring, comprising at least three rotating pulleys which have parallel pins and are disposed in an oblong housing, and at least two of which can be moved jointly against spring force in the longitudinal direction of the housing, and with a pull cord
5 which is guided over the pulleys and is guided with one end out of the housing.

Such a door spring is known from U.S. Patent 1,880,870. In these known door spring four pulleys are fitted two by
10 two with parallel pins in two runners which can be moved in the longitudinal direction of the housing and which are each connected by means of a tension spring to an end of the housing; fitted in the middle of the housing is a guide piece for the cord, and the cord is taken to the
15 outside near the guide piece in the middle of the housing.

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The disadvantage of this known door spring is a complex design with great length; since the cord is taken out in the middle of the housing, the door spring also has to be fitted in the middle of the lintel, which means that
5 there is little freedom as regards fitting.

The object of the invention is to produce a reliable door spring of the type mentioned in the preamble with a cheap design which can be fitted by the average "do-it-yourself" person and need not be fitted in the middle
10 of the lintel. This object is achieved according to the invention in that the two jointly movable pulleys are coaxial with one another and can rotate freely relative to each other, the pin of the third pulley is fitted in
15 fixed fashion in the housing, and the cord, starting from a fastening point, near the third pulley is conveyed first over the first pulley, then over the third pulley, and subsequently over the second pulley, and is taken out of the housing near the third pulley.

20 Advantageous embodiments of the door spring according to the invention are described in the depending claims 2-4.

In the drawings:

25 Fig.1 is a perspective view of part of a door, to be operated by the door spring according to the invention;

Fig.2 is a schematic illustration of the cord guide used in this door spring;

30 Fig.3 is a bottom view of the door spring according to the invention;

Fig.4 is a longitudinal section through the door spring according to the invention;

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Fig.5 illustrates the fastening of the operating cord to the door.

In Fig.1 reference number 1 indicates a door fitted in a frame 2; fitted along the top edge of the frame is the door spring according to the invention, as a whole indicated by the reference number 3. Out of this door spring comes a cord 4, which is under tension and with its free end is fastened to a button 5 which slots into a catch 6 which is fastened to the door 1. Button and catch are illustrated in detail in Fig.5; it can be seen from this figure that the button is inserted via a feed groove 7 into the recessed part 8 of the catch 6. This makes it simple to make the door spring inoperative by removing the button from the catch, while the user can himself in a simple manner determine the length of the pull cord - and thus the maximum opening angle of the door - and the force exerted on the door.

Fig.2 shows schematically the guiding of the draw cord 4 of the door spring. The pin 11 of the guide pulley 10 is fixed in the housing; the coaxial guide pulleys 12, 13 are rotatable independently of one another about the pin 14, and the whole assembly is fitted in the housing in such a way that it can slide in the direction of the arrow 15 and is thus acted upon by the tension spring 16.

The cord 4 is anchored firmly with the fixed end 17 at 18 in the housing, passes over the pulley 13, then over the fixed pulley 10, then over the pulley 12, and is conveyed out of the housing at 19. Through this guidance, a considerable length of draw cord can be fitted in a housing with limited length.

Figs. 3 and 4 show a preferred embodiment of the door spring 3. This embodiment comprises an oblong housing 25 with a bottom 26 and upright walls 27, 28 with end edges

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29 and 30; the housing may be closed off at the bottom
by the removable cover plate 31. Provided in the housing,
so that it can slide in the longitudinal direction, is
a runner 32 with the pin 14 for the pulleys 12, 13; the end
5 33 of the runner is connected to two adjacent tension springs
34, 35, which with the other end are fastened firmly to
the end piece 36 closing off the right end of the housing.
At the left end of the housing is the end piece 37 with
the pin 38 for the fixed pulley 10. A cover 39 with feed-
10 through aperture and guide groove 41 closes off this end
of the housing. The cord can be directed clockwise or anti-
clockwise as desired.

-Claims-

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Claims:

1. Door spring, comprising at least three rotating pulleys (10, 12, 13) which are disposed in an oblong housing (25) and have parallel pins, at least two of which (12, 13) can be moved jointly against spring force (16) in the longitudinal direction of the housing, and with a pull cord (4) which is guided over the pulleys (10, 12, 13) and is conveyed with one end out of the housing, characterized in that the two jointly movable pulleys (12, 13) are coaxial and can rotate freely relative to each other, the pin of the third pulley (10) is fitted in fixed fashion in the housing (25), and the cord (4), starting from a fastening point (18) near the third pulley (10), is conveyed first over the first pulley (13), then over the third pulley (10), and subsequently over the second pulley (12), and is taken out of the housing near the third pulley (10).

2. Door spring according to claim 1, characterized in that the oblong housing (25) is U-shaped in cross section, while a runner (32) is guided slidingly in the housing (25), and carries a pivot pin (14) standing at right angles to the housing for the first (13) and second pulley (12), said runner (32) being connected by means of at least one coil spring (34) to a first end piece (36) shutting off one end of the housing, while fitted in the other end of the housing is a second end piece (37) which carries the pivot pin (38) of the third pulley (10), said pivot pin standing at right angles to the longitudinal axis of the housing.

3. Door spring according to claim 2, characterized in that two adjacent tension springs (34, 35) are fitted between runner (32) and first end piece (36).

4. Door spring according to claim 1-3, characterized in that the free end of the cord is connected with a button (5) which by means of a feed groove fits into the recessed part of a catch (6) to be fitted to the door.

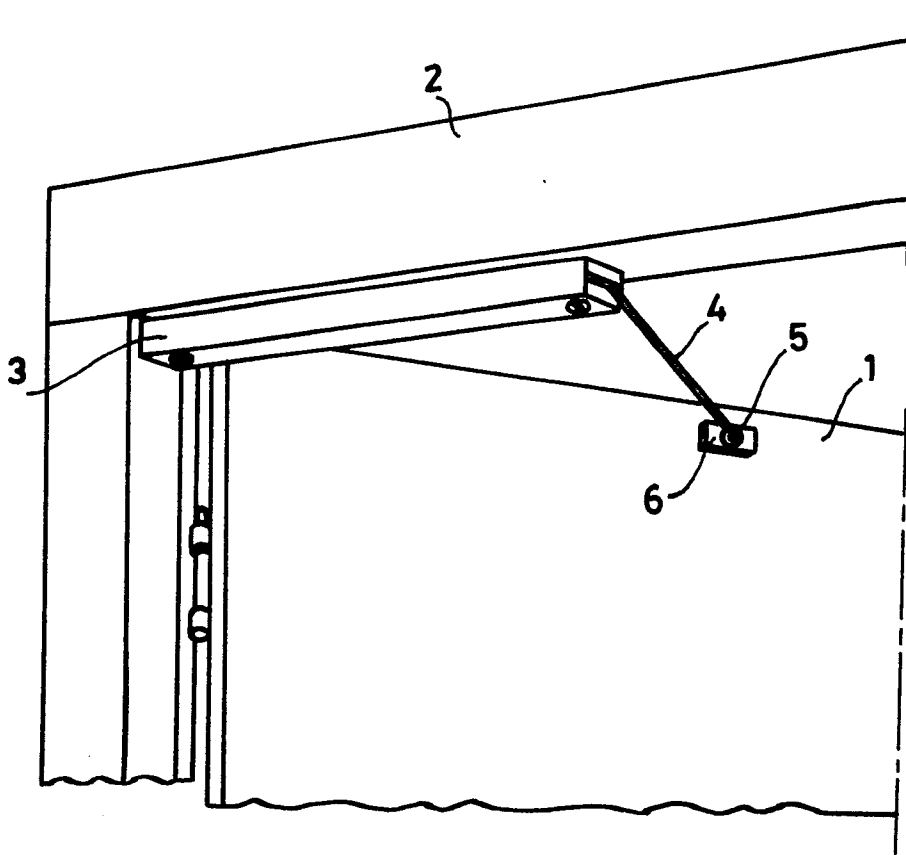


FIG. 1.

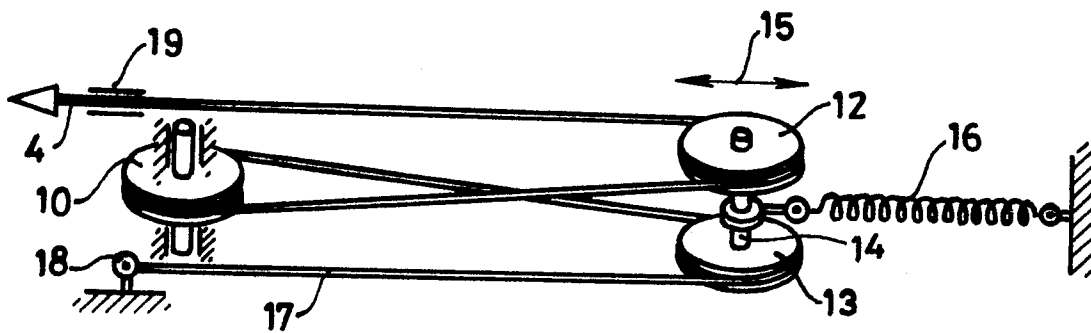
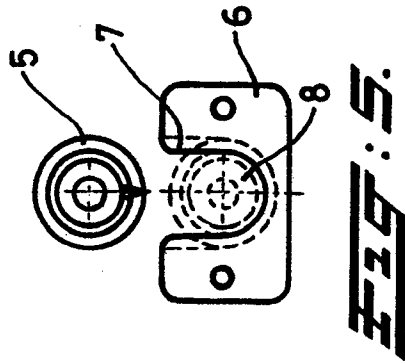
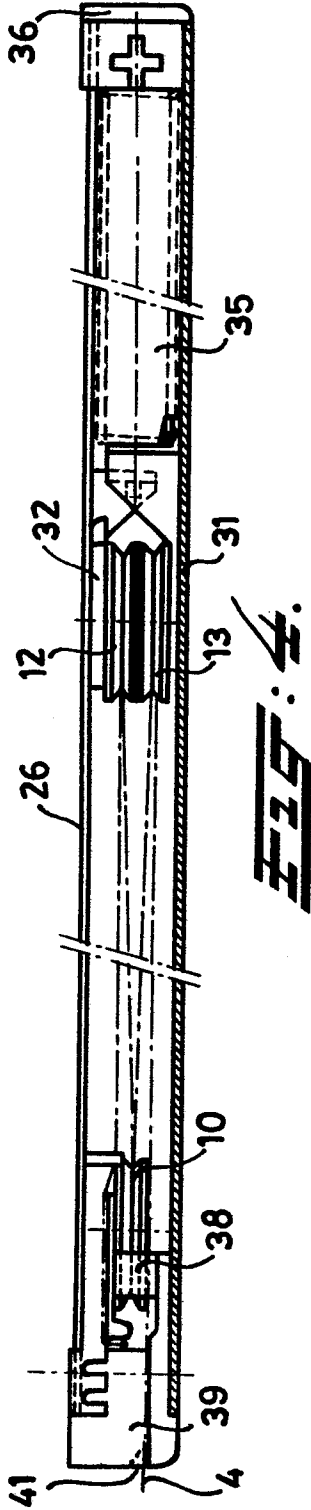
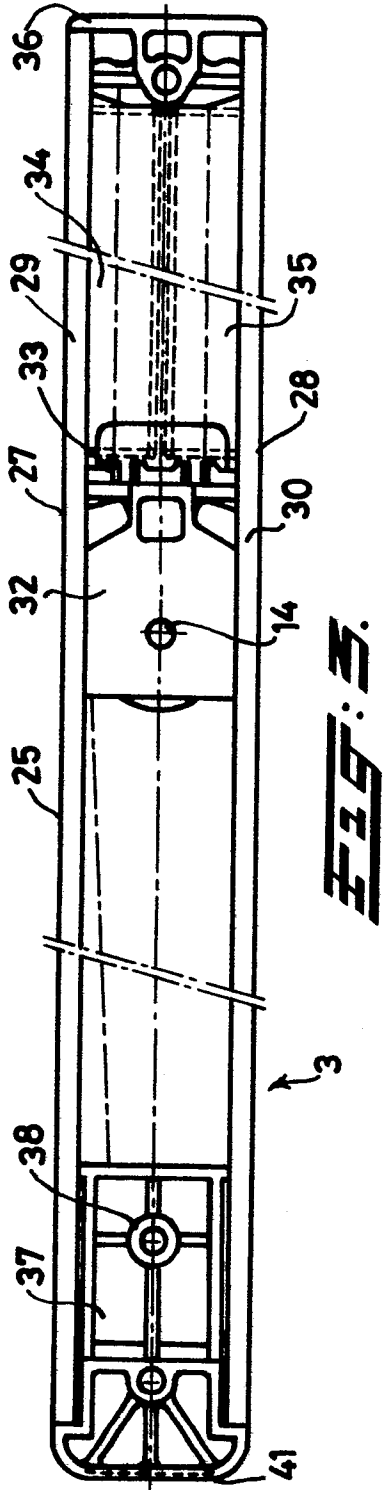


FIG. 2.

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EUROPEAN SEARCH REPORT

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Application number

EP 86 20 0061

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
Y,D	US-A-1 880 870 (DEMO) * Page 1, lines 58-100; page 2, lines 1-36; figures 1-5 *	1,2	E 05 F 1/10
Y	US-A-4 003 102 (HAWKS) * Column 5, lines 61-68; column 6, lines 1-4 *	1,2	
A	DE-C- 187 430 (BAUER) * Page 1, lines 1-6 *	3	
A	BE-A- 415 427 (HAWOTTE) * Figures 4-7 *	4	
A	US-A-2 833 270 (BROWN)		
A	FR-A-2 504 182 (FAUVEL)		E 05 F
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
Place of search THE HAGUE		Date of completion of the search 21-04-1986	Examiner NEYS B.G.

EPO Form 1503 03 82

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- X : particularly relevant if taken alone
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