

No. 865,951.

PATENTED SEPT. 10, 1907.

F. S. SEAGRAVE.  
LADDER.

APPLICATION FILED JULY 2, 1906.

2 SHEETS—SHEET 1.

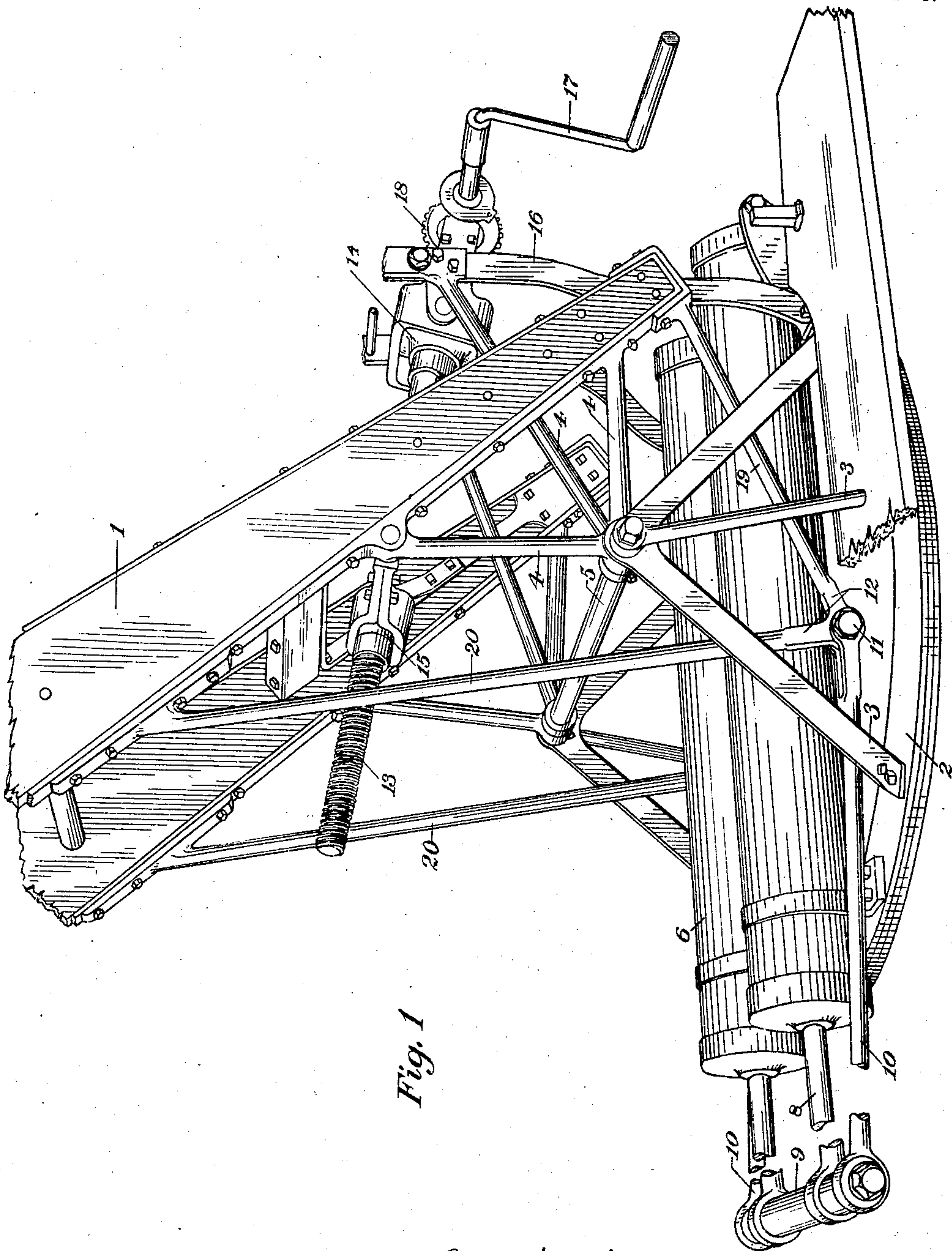


Fig. 1

WITNESSES:

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*R. Rogers*

*Frederic Seath Seagrave* INVENTOR

BY  
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ATTORNEY

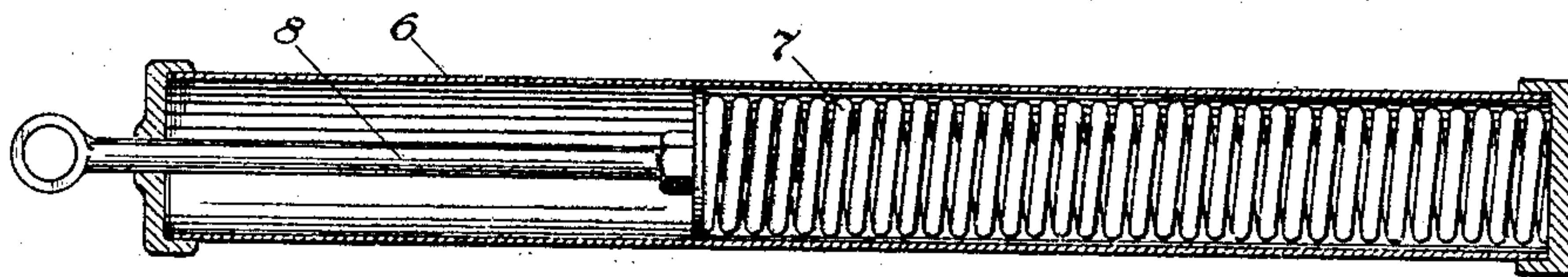
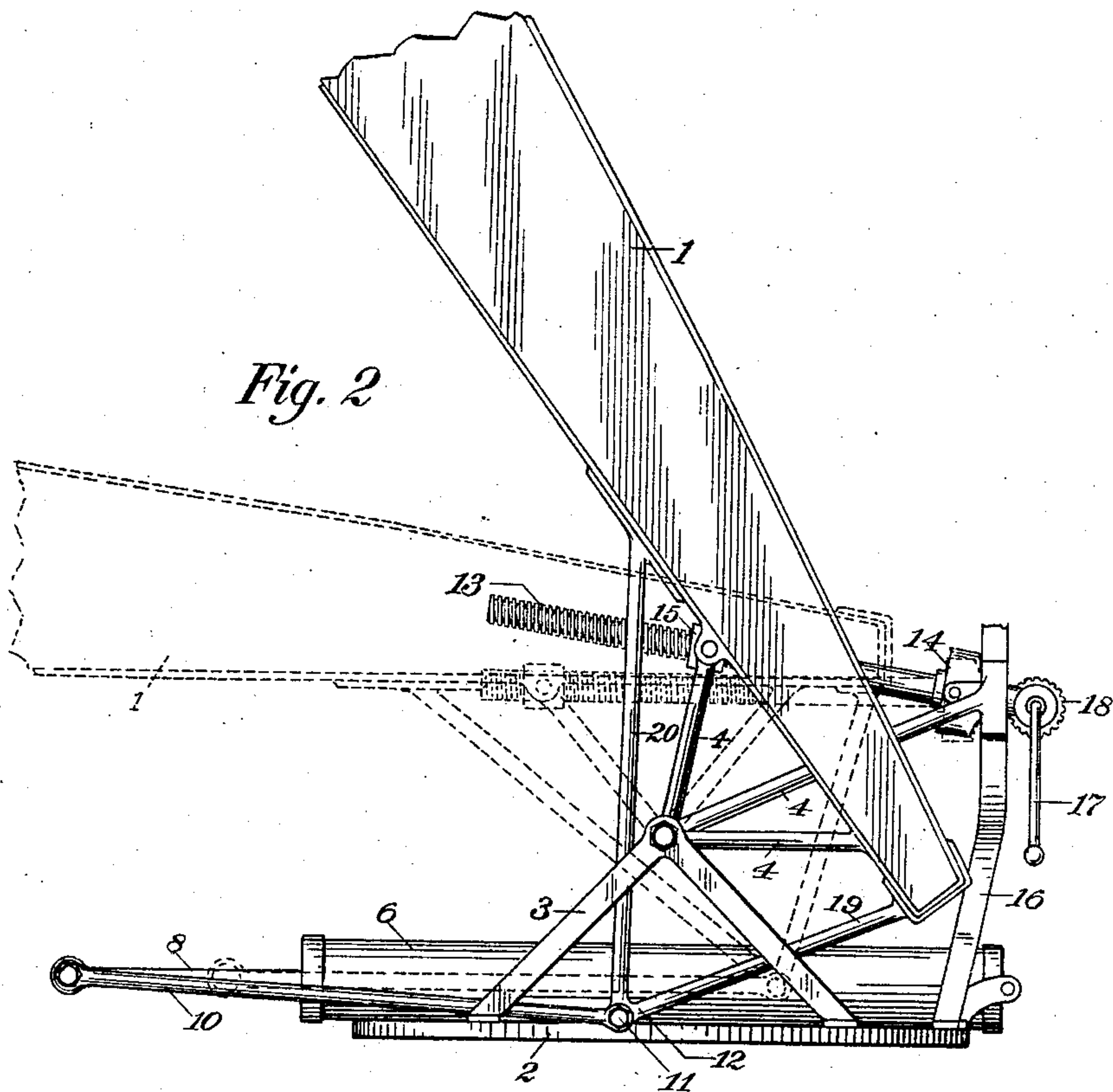
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*Fig. 3*

**WITNESSES:**

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# UNITED STATES PATENT OFFICE.

FREDERIC SCOTT SEAGRAVE, OF DETROIT, MICHIGAN.

## LADDER.

No. 865,951.

Specification of Letters Patent.

Patented Sept. 10, 1907.

Application filed July 2, 1906. Serial No. 324,339.

*To all whom it may concern:*

Be it known that FREDERIC SCOTT SEAGRAVE, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, has invented certain new and useful Improvements in Ladders, of which the following is a specification.

My invention relates to improvements in ladder constructions, especially in the means for elevating and controlling the same, and comprehends parts and arrangements of parts which coact to produce a ladder which may be quickly and securely raised and lowered, and in which the lifting force is exerted largely by springs, the screw serving principally to control the movement and to lock the ladder at any desired elevation. The use of springs in the art is well known, but my arrangement thereof and the manner of applying their expansive force to the ladder in combination with a screw suspended in pivoted bearings for controlling the ladder movement, is new and operates to produce a highly efficient and quickly manipulated ladder elevating construction.

In the accompanying drawings Figure I is a perspective of the ladder hoisting construction with parts broken away; Fig. II is a side view showing in dotted lines the position of the parts when the ladder is in its normal lowered position; Fig. III is a longitudinal section through a casing, showing the spring and plunger.

Referring to the drawings in which the same reference numeral indicates the same part throughout, 1 is a ladder body supported on the turn table 2 by the bracing constructions 3 rising from the turn table and 4 secured to the ladder, the two constructions being connected at the apexes by the rotatable shaft 5, upon which the ladder is supported.

Mounted upon the turn table is a casing 6, within which is carried a strong coiled spring 7, bearing against the rear end of the casing; passing through the front end of the casing is a plunger 8 arranged to lie against the end of the coiled spring and to compress the same. In the construction shown in the drawings a pair of casings is provided, and the plungers at their outer ends are secured to the transverse shaft 9. Pivotally secured to each end of said shaft is a rod 10 which at its other end 11 is pivotally secured to the apex of the frame 12 suspended from the ladder body. As is seen, the parts are in duplicate with the exception of the shafts 9 and 5.

13 is a screw mounted in pivoted bearings at 14 and 15; the bearing 14 is mounted between standards 16 rising from the turn table, and the bearing 15 is suspended from the ladder body, the bearings being on opposite sides of the ladder pivot shaft. The screw is actuated by winches, one being shown at 17, through bevel gearings, one shown at 18, in a well known way. The springs are constructed of great strength so as to

furnish by their expansion the principal part of the force necessary to elevate the ladder, and the screw is adapted to be used chiefly for controlling the movement of the ladder and locking the same at any desired angle of elevation; the latter also exerts some degree of lifting influence upon the ladder. The screw is positioned above the pivot shaft, is swung in pivoted bearings, is applied directly to the ladder body, and therefore more completely and quickly controls the movement of the ladder. The springs are mounted horizontally on the turn table and by their expansion against the plungers, force outwardly the yoke like construction composed of the shaft 9 and the rods 10, which exerts a pull upon the depending frame 12, the rear arm 19 pulling downwardly upon the rear end of the ladder, upon the rear side of the pivot shaft, the arm 20 pushing upwardly on the ladder on the forward side of the pivot shaft.

In the above described construction the pivot shaft is between the ladder body and the turn table and the power of the springs is applied below the pivot while the screw is applied to the ladder body above the pivot. The spring casings are secured firmly to the turn table and the power of the springs is applied along a fixed horizontal line, whereby the full power of the springs is utilized and the objectionable features of the construction in which the springs are tilted to accommodate their direction to the angle of elevation of the ladder, is avoided.

In my construction it is seen that I provide such devices and arrange them in such manner that the elevating of the ladder is done quickly and surely, the power is applied at the points where it is most effective in producing quick results, and a construction is provided which is not likely to get out of order in use.

Having described my invention, what I claim as new and desire to secure by Letters Patent is—

1. A ladder elevating device comprising a ladder body mounted upon a pivot shaft passing through the apexes of supporting frames mounted upon the turn table, casings mounted in fixed horizontal position upon said turn table, springs inclosed within said casings, plungers operating within said casings and adapted to be actuated in a horizontal line by said springs, a transverse shaft connecting the external ends of said plungers, angular frames independent of said ladder supporting frames secured to said ladder body on opposite sides of said pivot shaft, and depending therefrom and having their lower ends in proximity to said turn table, rods pivotally secured to the lower ends of said frames and connecting the same with said transverse shaft, whereby the expansive force of said springs is communicated to said ladder body to elevate the same, and means for controlling the elevation of said ladder and locking the same at any desired point.

2. A ladder elevating device comprising in combination with a ladder body mounted upon a pivot shaft intermediate said ladder body and the turn table, said pivot shaft passing through the apexes of supporting frames secured respectively to the turn table and to the ladder body, of casings mounted in fixed horizontal position upon

said turn table, springs inclosed within said casings, plungers operating within said casings and adapted to be actuated in a horizontal line by said springs, a transverse shaft connecting the external ends of said plungers, angular frames independent of said ladder supporting frames secured to said ladder body on opposite sides of said pivot shaft, and depending therefrom and having their lower ends in proximity to said turn table, rods pivotally secured to the lower ends of said frames and connecting the same with said transverse shaft, whereby the expansive force of said springs is communicated to said ladder body to elevate the same, and a screw mounted above said

pivot shaft, in pivotal bearings disposed on opposite sides of said pivot shaft, one of said bearings being secured to said ladder body, and the other secured upon an independent frame rising from said turn table, said screw being adapted to control the elevation of said ladder and to lock the same at any desired point. 15

In testimony whereof I affix my signature in the presence of two witnesses.

FREDERIC SCOTT SEAGRAVE.

Witnesses:

ARVILLA RAGER,  
GEO. W. RIGHTMIRE.