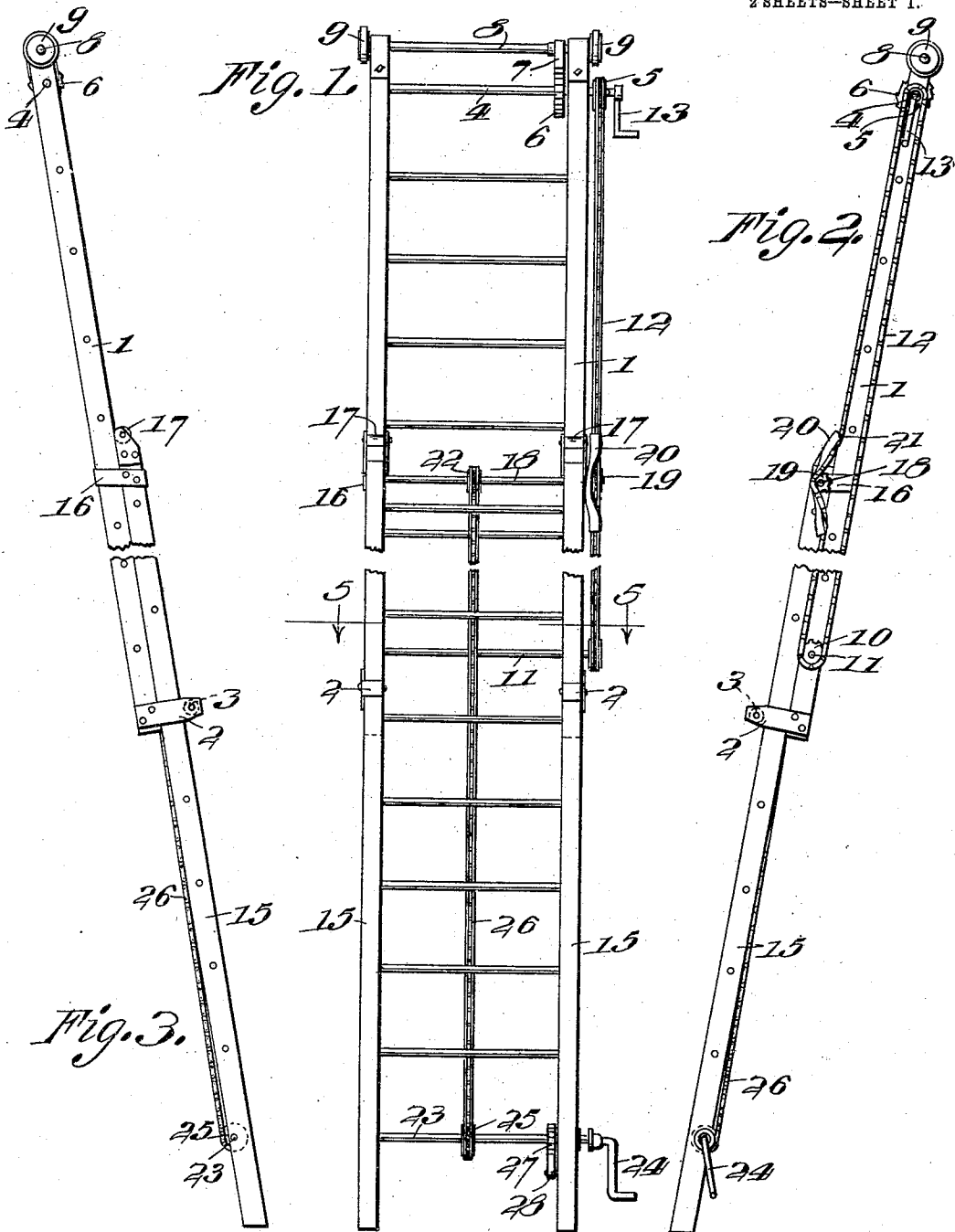


J. L. SETZER.
EXTENSION LADDER.
APPLICATION FILED DEC. 10, 1908.

Patented July 27, 1909.

2 SHEETS—SHEET 1.

929,169.



Witnesses
E. D. Brown.
C. H. Griesbauer

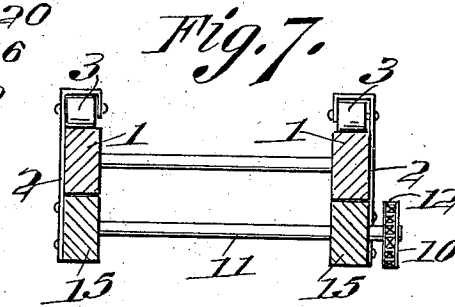
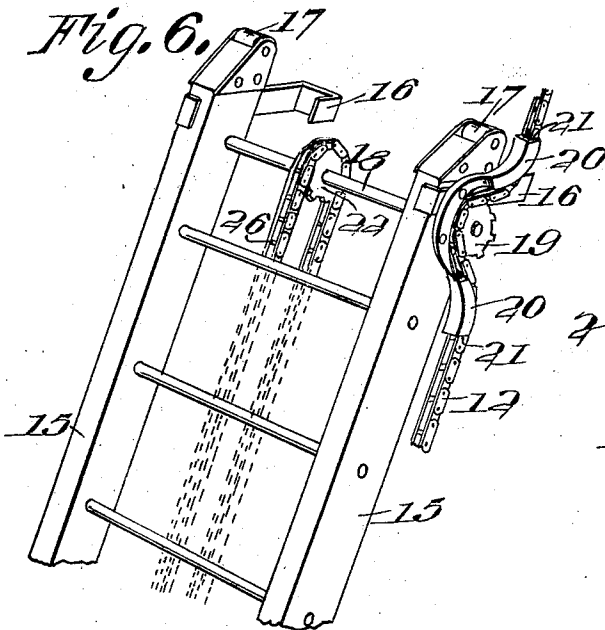
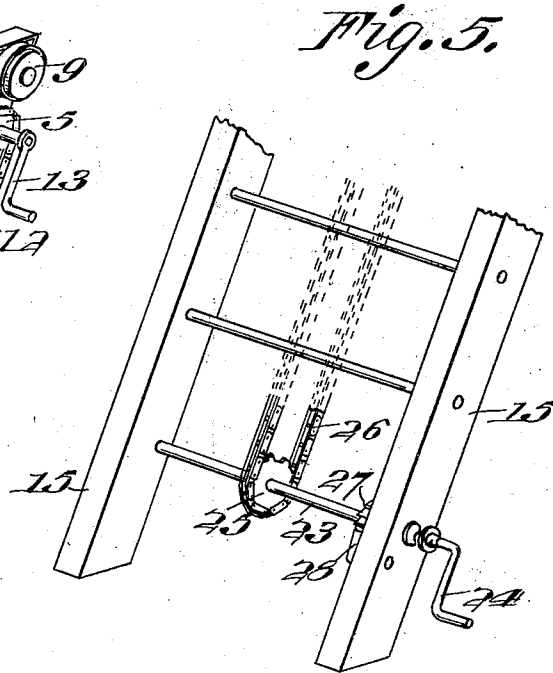
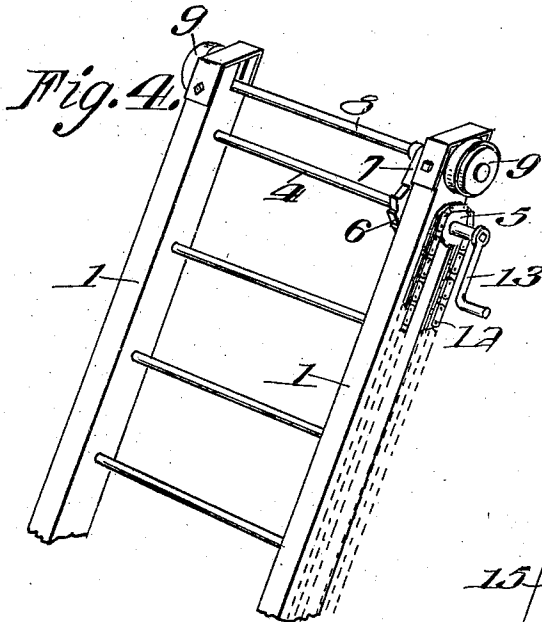
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

JOHN LESLIE SETZER, OF STANBERRY, MISSOURI.

EXTENSION-LADDER.

No. 929,169.

Specification of Letters Patent.

Patented July 27, 1909.

Application filed December 10, 1908. Serial No. 466,848.

To all whom it may concern:

Be it known that I, JOHN LESLIE SETZER, a citizen of the United States, residing at Stanberry, in the county of Gentry and State of Missouri, have invented certain new and useful Improvements in Extension-Ladders; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to extension ladders, and the object thereof is to provide a simply constructed extension ladder which may be raised or lowered by the person on the ladder without necessitating his descending to the ground.

With these and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts, as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a front elevation of this improved ladder, Fig. 2 is a side elevation taken from the right side, Fig. 3 is a similar view taken from the other side, Fig. 4 is an enlarged detail perspective view of the upper end of the upper section, Fig. 5 is a similar view of the lower end of the other section, Fig. 6 is a similar view of the upper end of the lower section, Fig. 7 is a transverse section taken on the line 5—5 of Fig. 1.

In the embodiment illustrated two ladders or sections 1 and 15 are mounted to slide one on the other, the lower section 15 being preferably provided near its inner or upper end with clips or guides as 16, which extend around the upper section 1 to hold the sections against lateral movement relative to each other, and the upper section 1 is provided at its lower or inner end on the outer face thereof with upwardly extending standards 2, having their free ends bent laterally inward and provided with rollers as 3, which engage the upper edges of the section 15, to permit said section to freely move longitudinally and to prevent lateral displacement thereof. This section 1 is provided at its upper or outer end with a rotatable shaft 4, which is loosely mounted in the side members

thereof and projects at one end beyond one of the side members, said end being square at its terminal and having a sprocket wheel 5, mounted thereon with the square terminal extending outside of said sprocket wheel. A ratchet wheel 6 is secured to said shaft between the side members of the section 1 in position to be engaged by a pawl 7, mounted on a fixed shaft 8, which extends through the side members of the section 1 and is provided at its outer end with rollers 9, which are preferably provided with rubber tires for preventing marring of the surface against which they bear. A sprocket wheel 10 is mounted on a shaft 11 at the lower end of the section 1 at the outside thereof, and a chain 12 connects the sprocket wheel 10 and the sprocket wheel 5 at the outer end of the section 1 and is engaged with a similar wheel carried by the other section, as will be hereinafter described, for raising and lowering the section 15 when desired by means of a crank 13 which may be detachably connected with the squared end of the shaft 4.

The lower section 15 is provided at its inner or upper end with rollers 17, which are arranged to bear on the side members of the section 1 to provide a smooth sliding movement of one section relative to the other. A shaft 18 extends through the side members of the section 15 and projects at the side thereof corresponding to the side of the section 1, on which the sprocket wheels and chains are mounted, and has a sprocket wheel 19 and fixed thereto over which the chain 12 passes for a purpose to be described. A guide member 20 for said chain 12 is preferably mounted on one side of the section 15, and is made in the form of an approximately inverted U-shaped member secured to the section 15 in any suitable manner, and the free ends of said yoke or guide are preferably flared outwardly and are provided on their lower faces with grooves 21, through which the chain 12 passes, and is thereby guided in its movement over the sprocket wheel 19, to prevent its disengagement therefrom. A sprocket wheel 22 is fixed on the shaft 18 between the side members of the section 15 over which a sprocket chain to be described is adapted to pass.

A shaft 23 is mounted to revolve in the lower end of the section 15, and extends through one of the side members thereof and is provided with a crank handle 24 for rotating it. A sprocket wheel 25 is fixed to said shaft 23 and a sprocket chain 26 passes over this wheel 25 and the wheel 22 at the upper end of the section 15, and when the shaft 24 is rotated this chain is operated and turns the shaft 18 and the sprocket wheel 19, thereby operating the chain 12 and moving the section 1 upwardly relative to the section 15. A ratchet wheel 27 is also fixed to the shaft 23, and is designed to be engaged by a pawl 28, mounted on the adjacent side member of the section 15, which locks said shaft against rotation in one direction, thereby holding the ladder sections in adjusted position.

It will be obvious that by turning the shaft 23 the chain 26 will be operated to revolve the shaft 18 and sprocket wheel 19, and the chain 12 passing thereover, thereby raising the section 1 into any desired position and the pawl 28 in engagement with the ratchet wheel 27 will prevent the backward turning of the shaft 23 and hold said sections in adjusted position. When the person is at the upper end of the section 1 and desires to raise or lower it he simply turns the crank handle 24 to operate the sprocket wheel 25, which will move the section 1 forward relative to the section 15, and the pawl 28 in engagement with the ratchet wheel 27 will lock said shaft against backward turning and hold the sections in adjusted position.

From the foregoing description taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention as defined in the appended claims.

I claim as my invention.

1. An extension ladder comprising an upper and a lower section slidable one on the other, the upper section having shafts at opposite ends projecting through one side thereof, and sprocket wheels fixed on said projecting ends, a sprocket chain connecting said wheels, means for holding said shafts against turning in one direction, a shaft extending through the lower section and projecting beyond one side thereof and having a sprocket wheel on its projecting end for engagement by said sprocket chain, and means carried by the upper section for operating said last mentioned sprocket wheel to adjust one section relatively to the other.

2. An extension ladder comprising an upper and a lower section slidable one on the

other, the upper section having shafts at opposite ends projecting through one side thereof, and sprocket wheels fixed on said projecting ends, a sprocket chain connecting said wheels, means for holding said shafts against turning in one direction, a shaft extending through the lower section and projecting beyond one side thereof and having a sprocket wheel on its projecting end for engagement by said sprocket chain, a sprocket wheel fixed on said last mentioned shaft between the side members of the lower section, a rotatable shaft at the lower end of said lower section provided with means for operating it, a sprocket wheel fixed on said shaft, and a sprocket chain passing over the sprocket wheels of said upper section, and means for preventing the turning of said rotatable shaft in one direction.

3. An extension ladder comprising an upper and a lower section slidable one on the other, the upper section having shafts at opposite ends projecting through one side thereof, and sprocket wheels fixed on said projecting ends, a sprocket chain connecting said wheels, means for holding said shafts against turning in one direction, a shaft extending through the lower section and projecting beyond one side thereof and having a sprocket wheel on its projecting end for engagement with said sprocket chain, and means arranged adjacent said last mentioned sprocket wheel to hold the chain against disengagement therefrom.

4. An extension ladder comprising an upper and a lower section slidable one on the other, the upper section having shafts at opposite ends projecting through one side thereof, and sprocket wheels fixed on said projecting ends, a sprocket chain connecting said wheels, means for holding said shafts against turning in one direction, a shaft extending through the upper end of the lower section and projecting beyond one side thereof and having a sprocket wheel on its projecting end for engagement with said sprocket chain, and an inverted U-shaped member fixed to the lower section with the free ends of the arms thereof extending on opposite sides of said last mentioned sprocket wheel and provided with means for engaging the sprocket chain to hold it against disengagement from said sprocket wheel.

5. An extension ladder comprising an upper and a lower section slidable one on the other, the upper section having shafts at opposite ends projecting through one side thereof, and sprocket wheels fixed on said projecting ends, a sprocket chain connecting said wheels, means for holding said shafts against turning in one direction, a shaft extending through the lower section and projecting beyond one side thereof and having a sprocket wheel on its projecting end for engagement

with said sprocket chain, an inverted U-shaped member fixed to the lower section and having the free ends of its arms flared outwardly and provided on their lower faces
5 with grooves for engaging said chain to prevent its disengagement from said last mentioned sprocket wheel.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN LESLIE SETZER.

Witnesses:

B. F. Ross,
G. W. Bush.