

No. 731,328.

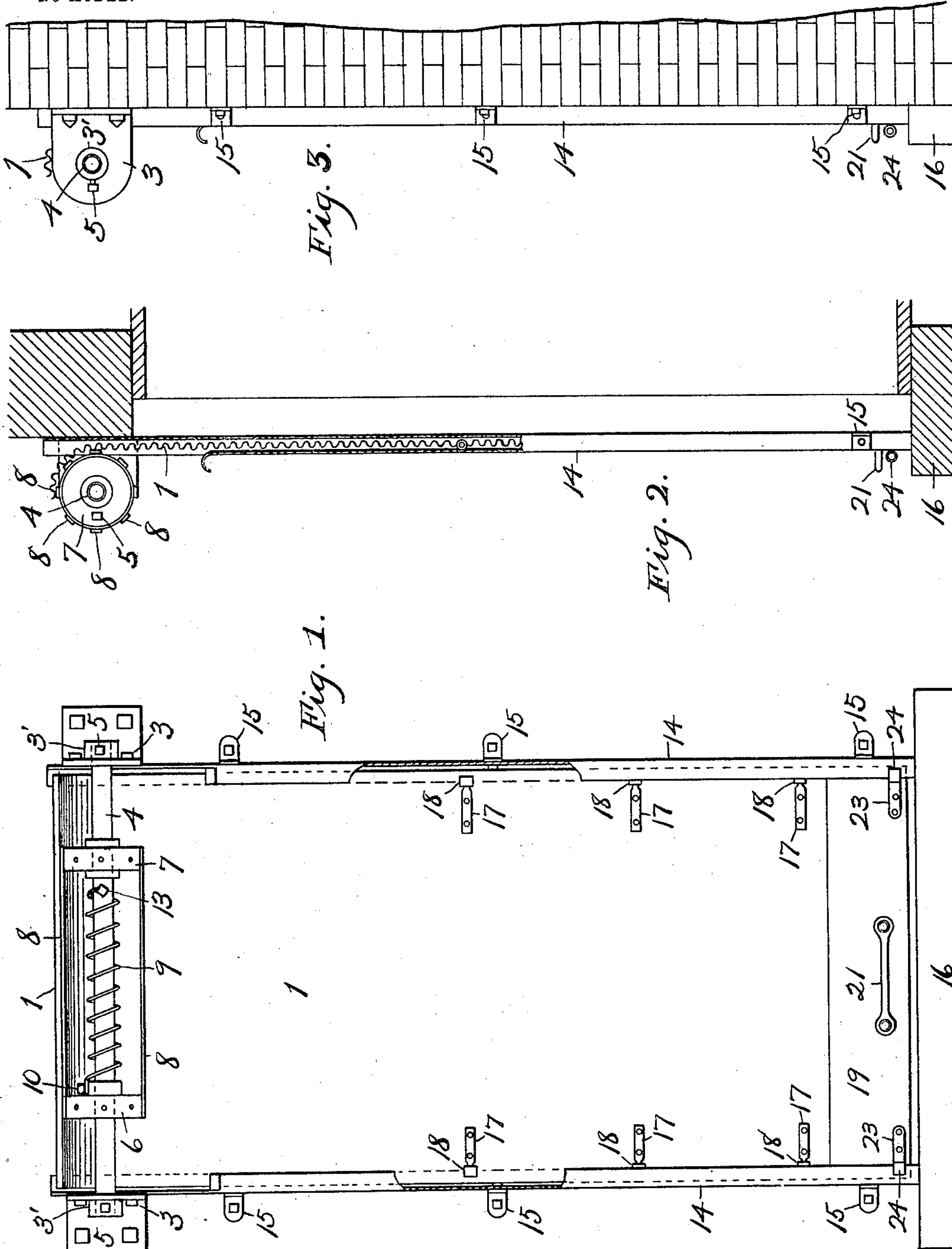
PATENTED JUNE 16, 1903.

J. H. SWEARINGER.
ROLLING STEEL SHUTTER OR DOOR.

APPLICATION FILED APR. 7, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

M. L. Lange,

K. M. Imboden.

INVENTOR,

J. H. Swearinger.

By Higdon & Higdon,
Attys.

No. 731,328.

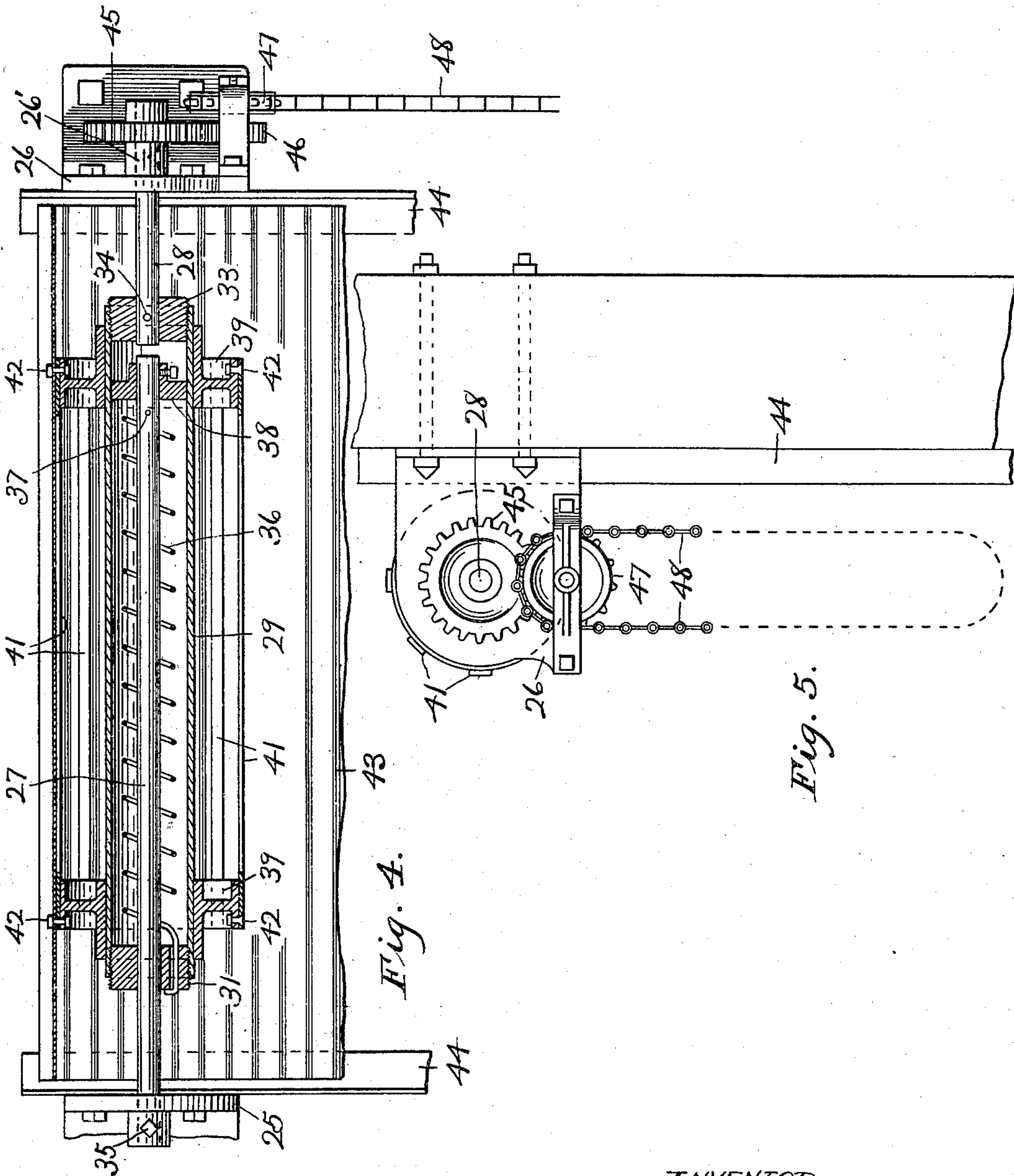
PATENTED JUNE 16, 1903.

J. H. SWEARINGER.
ROLLING STEEL SHUTTER OR DOOR.

APPLICATION FILED APR. 7, 1902.

NO MODEL.

2 SHEETS—SHEET 2.



WITNESSES:
M. L. Lange,
H. M. Imboden.

INVENTOR,
J. H. Swearinger.
By Higdon & Higdon
Attys.

UNITED STATES PATENT OFFICE.

JAMES H. SWEARINGER, OF KANSAS CITY, MISSOURI.

ROLLING STEEL SHUTTER OR DOOR.

SPECIFICATION forming part of Letters Patent No. 731,328, dated June 16, 1903.

Application filed April 7, 1902. Serial No. 101,654. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. SWEARINGER, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented new and useful Improvements in Rolling Steel Shutters or Doors, of which the following is a specification.

My invention relates to rolling fireproof shutters for windows or doors; and the object of my invention is to produce a more reliable and smoothly-working shutter of this class than has been employed heretofore.

My invention consists in the improved devices described hereinafter and pointed out in the appended claims.

Referring to the accompanying drawings, Figure 1 is a front elevation of the preferred embodiment of my invention, the shutter being down and each of the tracks being partly broken away. Fig. 2 is a sectional side elevation of the same, the nearest track-bar being partly broken away to expose the edge of the shutter. Fig. 3 is a side elevation of the shutter complete. Fig. 4 is an enlarged front elevation, partly in section, of a modified raising and lowering device, the tracks, shutter, and chain being broken off. Fig. 5 is a side or end elevation of the gearing and the adjacent bracket, the same parts being broken off as in Fig. 4.

1 is the shutter proper, it being formed of corrugated sheet metal with the corrugations horizontal.

At each side of a window or doorway a bracket 3 is bolted to the wall. Each bracket 3 is provided with a hollow boss 3', and a non-rotatable shaft 4 has its ends secured in said bosses by set-screws 5 or in any preferred manner. Mounted rotatably on said shaft are two wheels 6 and 7. A plurality of thin bars 8 are bolted to the peripheries of said wheels and extend from one wheel to the other to provide a continuous bearing for the shutter 1 therebetween. The upper part of the shutter is bolted to one or more of the cross-bars 8. In Fig. 1 all but two of said bars are omitted for clearness and to expose other parts.

Around the shaft 4, between the wheels 6 7, is placed a helical torsion-spring 9, one end of which is secured to the wheel 6 or to its

hub by a set-screw 10 or in any suitable manner. The other end of said spring is secured to the shaft 4 either by passing through a diametrical hole therein or by a set-screw 13. This shaft is preferably tubular for lightness and cheapness.

In setting up the shutter for use the shutter is rolled up around the wheels 6 7 before the shaft 4 is secured non-rotatably in the brackets 3. Then the set-screws 5 are tightened up. When the shutter is pulled down, it winds up the spring 9; but the spring is made weak enough so that the shutter when fully lowered will be held down by its own weight. The edges of the shutter 1 are guided by a pair of tracks 14, each track being an iron channel-bar, bolted to the wall by means of knees 15. These tracks may also be secured to the respective brackets 3. The bottoms of the tracks rest on the window-sill 16.

Riveted to the outer face of the shutter 1, at each side thereof, are several bearing-plates 17, the outer ends of which are turned round, and antifriction-rollers 18 are mounted on these rounded ends. In diameter said rollers extend nearly from flange to flange of the track-bars 14. Secured to the bottom of the corrugated portion of the shutter is a metal plate 19, provided with a handle 21 for raising and lowering the shutter. Secured to the sides of said plate 19 are bearing-plates 23, carrying antifriction-rollers 24, which touch the front faces of the track-bars 14. Thus the friction between the shutter and its tracks is largely reduced by the aforesaid rollers 18 and 24. The shutter 1 having been lowered, a slight upward pressure on the handle 21 will be sufficient to raise or start the shutter, as the tension of the spring 9 will tend to pull the shutter up with the greatest force when the latter is down.

Figs. 4 and 5 represent my modified raising and lowering apparatus especially designed for the largest and therefore the heaviest rolling steel shutters, which may be manipulated with or without sprocket-wheels and chains, the same as in my preferred forms, Figs. 1 and 3. 25 and 26 are the shaft-supporting brackets bolted to the wall. The shaft is preferably tubular and is made in two pieces—a long shaft 27 and a short shaft 28. Around shaft 27 is a concentric drum

29, having internally-threaded ends, in one of which is a bushing 31, mounted rotatably on shaft 27, and in the other said end is a bushing 33, mounted on shaft 28. The drum 29, bushing 33, and shaft 28 are secured together by a pin 34, making them operatively one piece. The other bushing 31 stays in position in the end of the drum 29 by the friction of the screw-threads. Shaft 27 is secured non-rotatably in bracket 25 by a set-screw 35 or by a pin, if preferred; but the other shaft 28 is rotatable in bracket 26, having a boss 26' thereon. Around shaft 27 within the drum 29 is a helical spring 36. One end of the spring passes through a hole in bushing 31. Its opposite end 37 passes through a hole in said shaft 27. Thus rotation of the drum 29 will wind or relax the spring 36. To hold the inner end of shaft 27 concentric with the drum 29, a wheel 38 is secured thereon, it having a sufficiently loose fit with the inside of the drum to permit rotation of the latter. Two wheels 39 are rigidly secured on the ends of the drum 29, and their peripheries are connected by thin cross-bars 41, two of which are shown, partly in section, in Fig. 4 to show the bolts 42, which connect them to the wheels 39. These bolts 42 pass through the shutter 43 also, thereby securing the top of the shutter indirectly to the wheels 39. 44 represents the track-bars inclosing the edges of the shutter 43. A gear-wheel 45 is secured on the outer end of the short shaft 28 and is engaged by a pinion 46, which is integral with or secured to a sprocket-wheel 47, from which hangs an endless chain 48. The operation of the entire device is that when the shutter 43 is pulled down it rotates the drum 29 and bushing 33, which winds up the spring 36, as the other end of the spring is secured to shaft 27, and hence cannot turn. The weight of the shutter holds it down until the chain 48 is pulled in the direction of the arrow. This turns the aforesaid gearing, shaft 28, bushing 33, drum 29, and wheels 39 and raises the shutter, this operation being facilitated by the elasticity of the spring 36.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A spring-actuated roller for metallic shutters, comprising a non-rotatable shaft, a pair of wheels mounted thereon rotatably, a plurality of cross-bars having their ends se-

cured to the peripheries of said wheels, and a helical spring on said shaft between said wheels, one end of said spring being secured to one of the wheels and its opposite end being secured to said shaft; substantially as described.

2. The combination of a non-rotatable shaft, brackets supporting the same, a pair of wheels mounted rotatably on said shaft, a plurality of cross-bars having their opposite ends connected to the respective peripheries of said wheels, a helical spring on said shaft between said wheels, the ends of said spring being secured to one of said wheels and said shaft, respectively, and a flexible shutter secured to one or more of said cross-bars; substantially as described.

3. In a spring-actuated metallic shutter, the combination of a shaft supported on brackets, an actuating helical torsion-spring and wheels mounted on said shaft, shutter-supporting bars carried by said wheels, guide or track bars secured to the walls of a building, flexible shutters secured to said first-mentioned bars and adapted to loosely engage said guide-bars, and means for opening and closing the shutters, substantially as described.

4. The combination, with a flexible shutter, of a pair of brackets, a non-rotatable shaft supported by one of said brackets, a rotatable shaft in alignment with the aforesaid shaft and supported by the other bracket, a concentric drum around said non-rotatable shaft, bushings 31 and 33 on said shafts, secured in the ends of said drum, a driving connection between said drum and said rotatable shaft, means for holding the non-rotatable shaft concentric with said drum, a helical spring around said shaft, one end of said spring being secured to said bushing 31 and its opposite end to said shaft, a pair of wheels rigidly secured on said drum as on a shaft, and a plurality of cross-bars having their opposite ends secured to said wheels respectively, said shutter being secured to one or more of said cross-bars; substantially as described.

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

JAMES H. SWEARINGER.

Witnesses:

M. L. LANGE,
K. M. IMBODEN.