

No. 639,189.

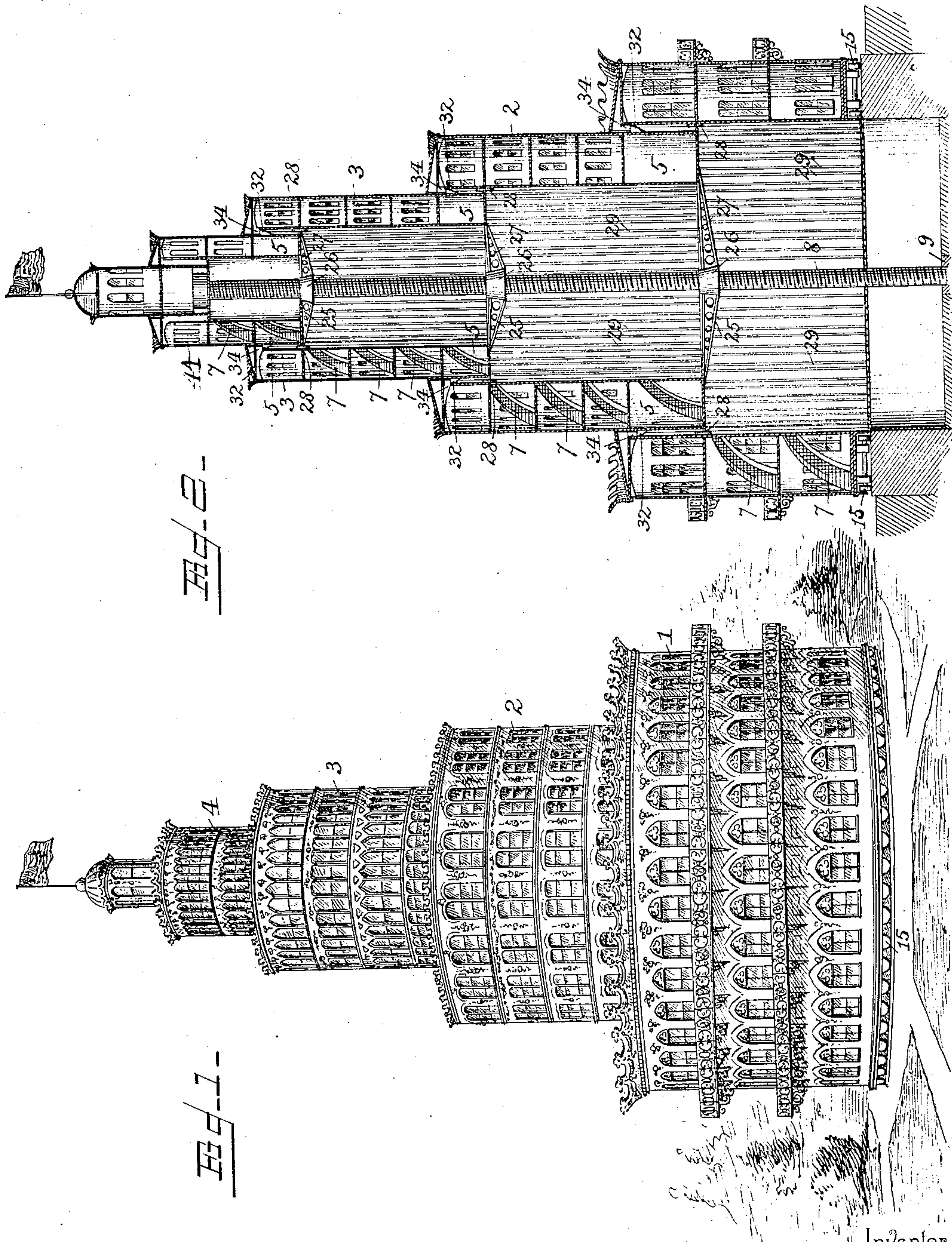
Patented Dec. 12, 1899.

H. A. VAN DER CRUYSSSEN.
TELESCOPIC TOWER.

(Application filed Dec. 20, 1898. Renewed Oct. 27, 1899.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses

Cha H. Ourand
J. J. Riley

By his Attorneys,

H. A. Van der Cruyssen

Inventor

C. A. Snow & Co.

No. 639,189.

Patented Dec. 12, 1899.

H. A. VAN DER CRUYSSSEN.

TELESCOPIC TOWER.

(Application filed Dec. 20, 1898. Renewed Oct. 27, 1899.)

4 Sheets—Sheet 2.

(No Model.)

Fig. 3.

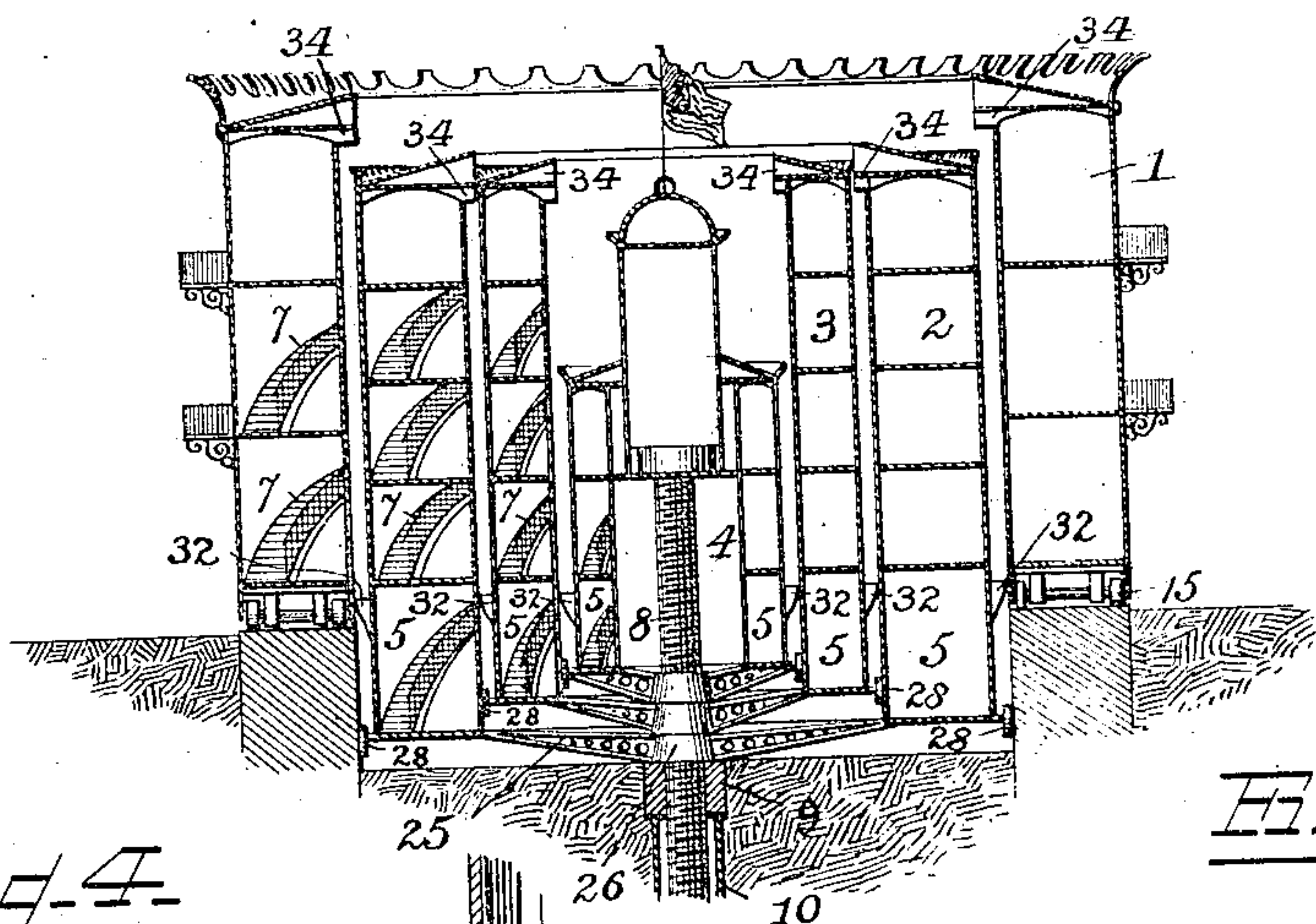


Fig. 4.

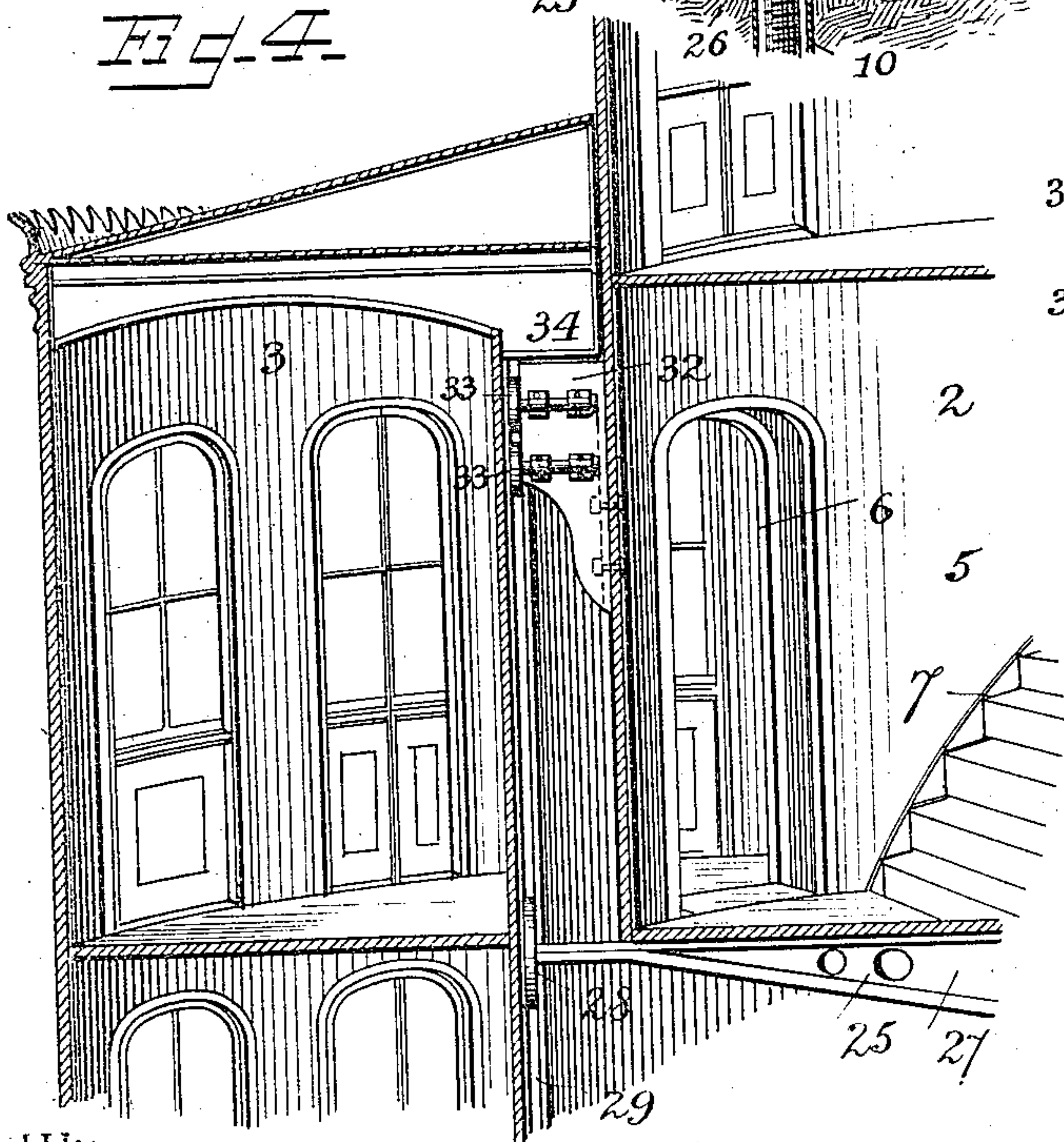
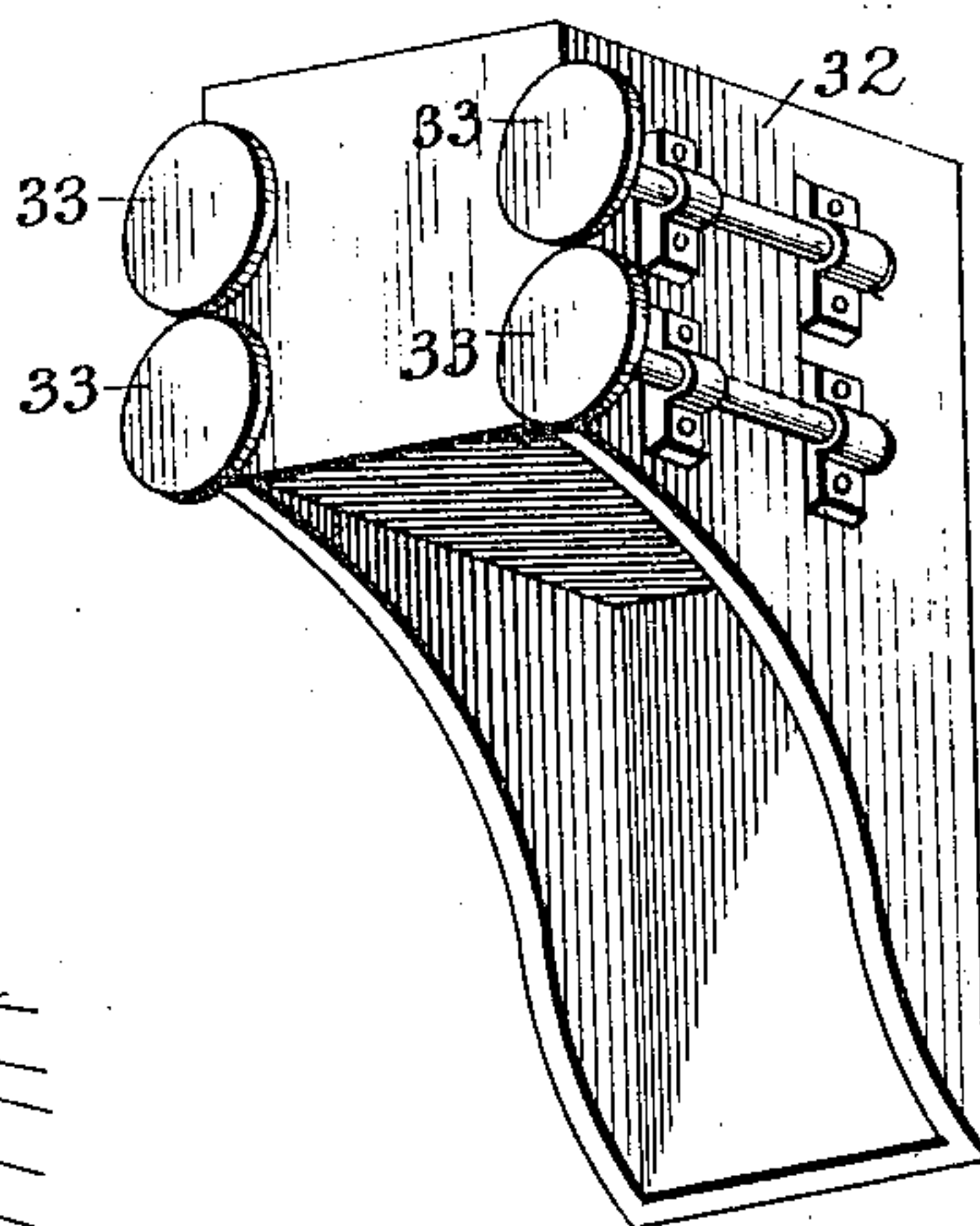


Fig. 14.



Witnesses

Chas. H. Curand
J. J. Pley

By his Attorneys.

Inventor
H. A. Vander Cruysen

C. A. Snow & Co.

No. 639,189.

Patented Dec. 12, 1899.

H. A. VAN DER CRUYSSSEN.
TELESCOPIC TOWER.

(Application filed Dec. 20, 1898. Renewed Oct. 27, 1899.)

(No Model.)

4 Sheets—Sheet 3.

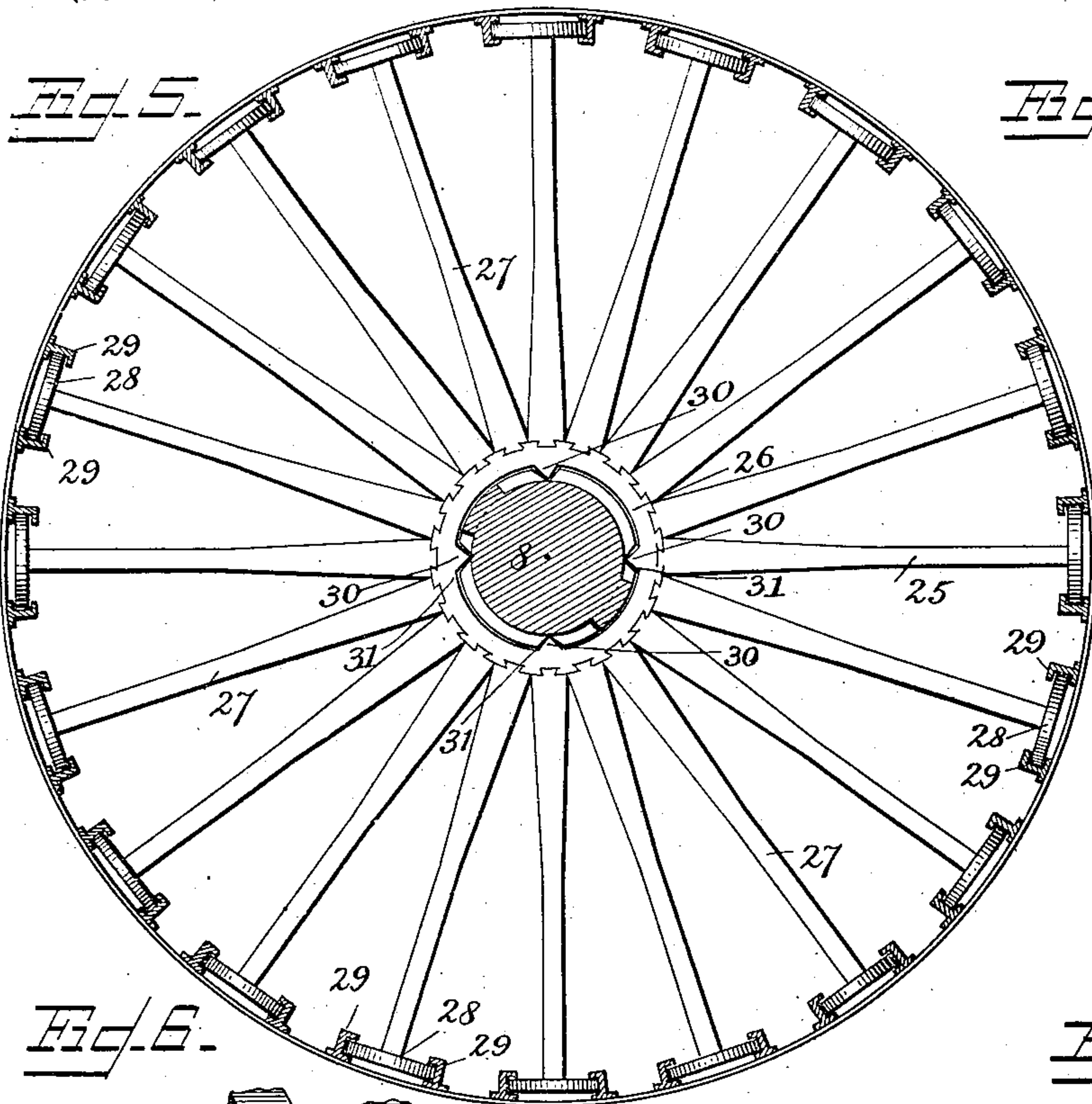


Fig. 7.

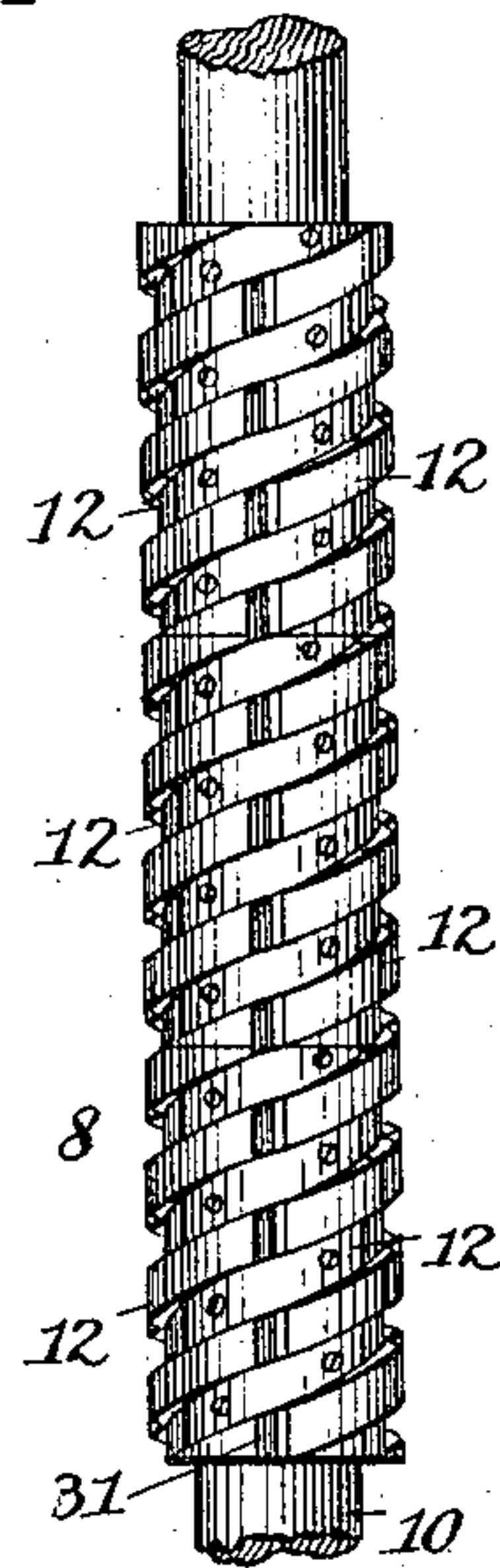


Fig. 6.

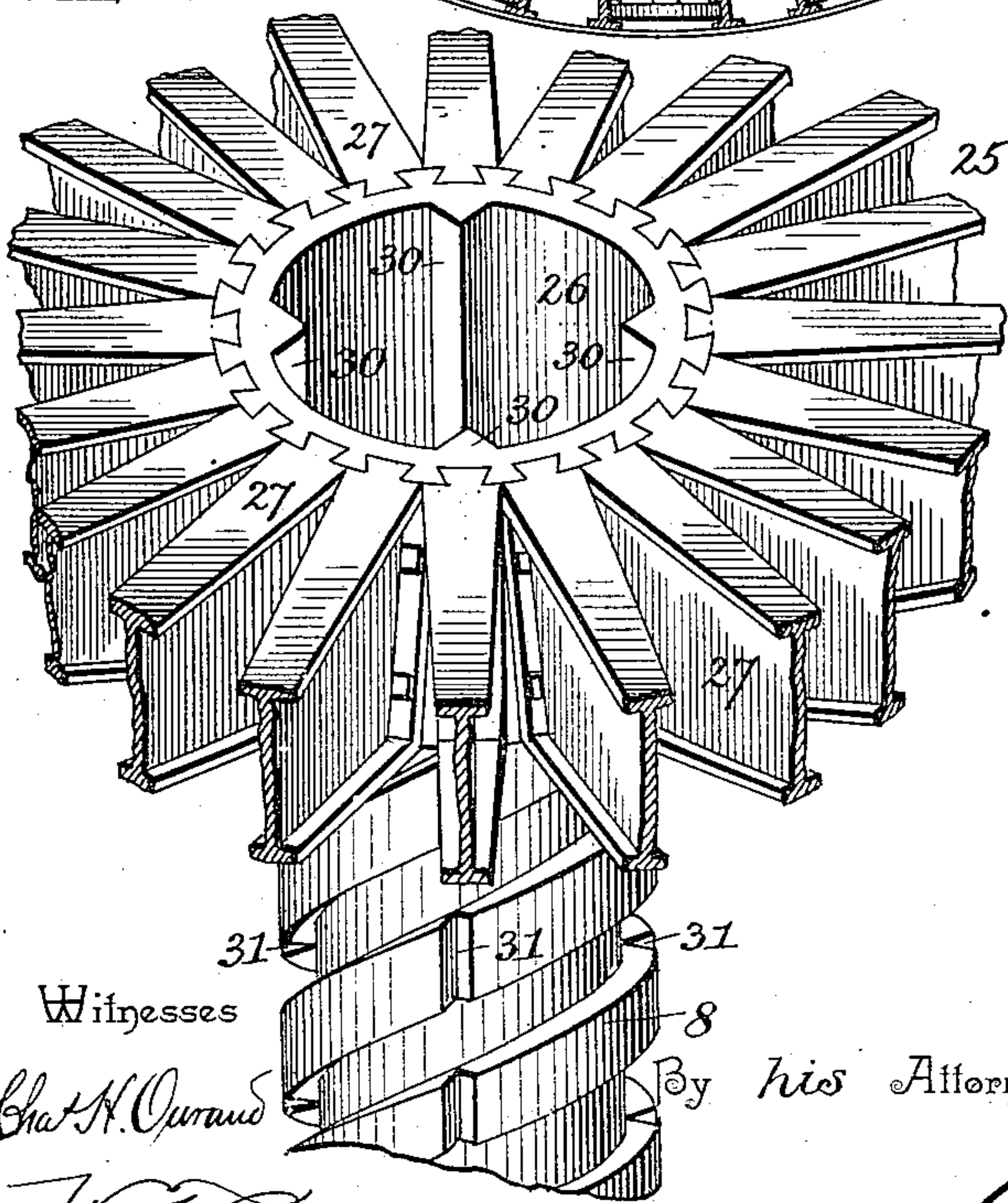


Fig. 8.

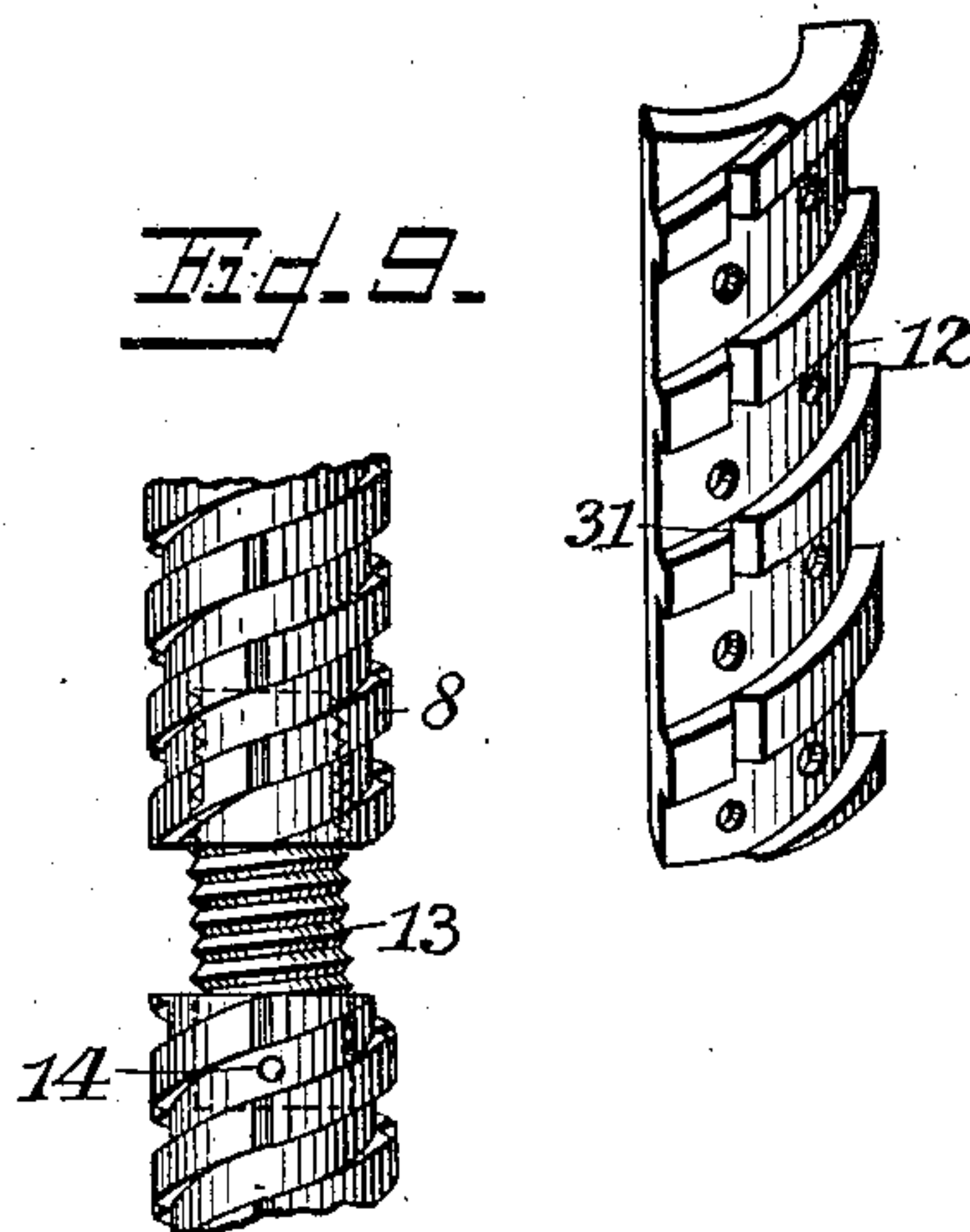
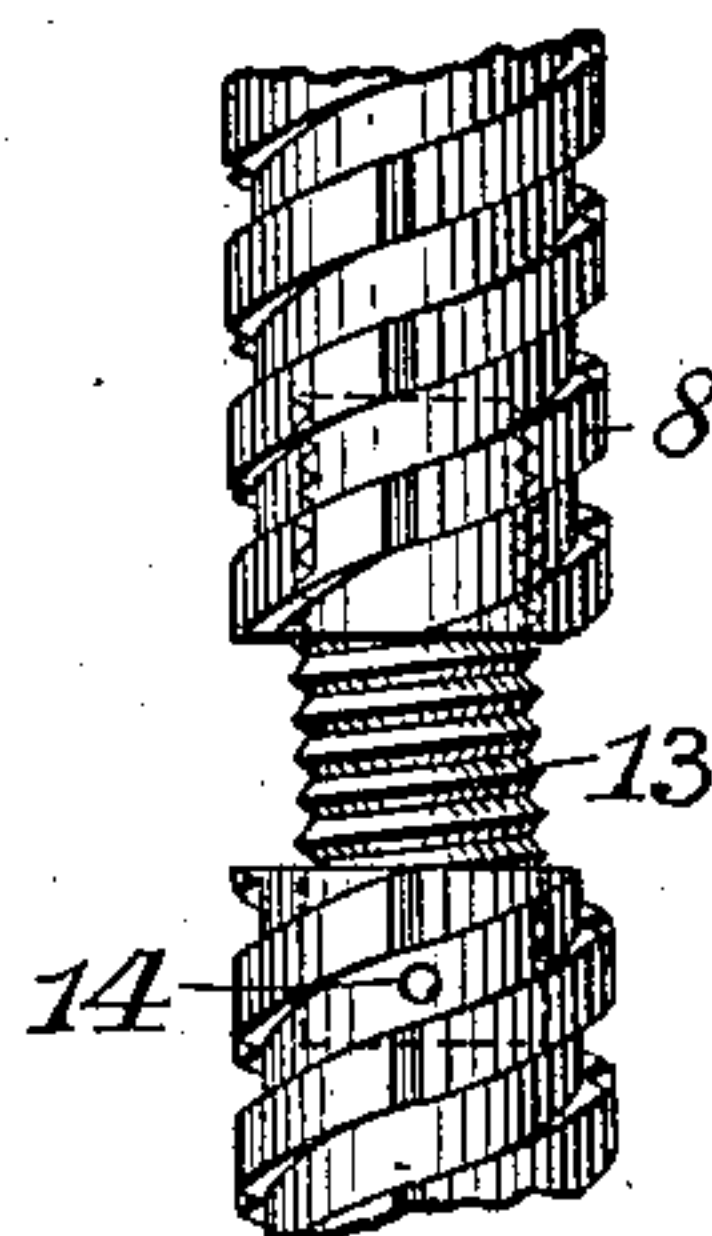


Fig. 9.



Witnesses

Chas. H. Curran

J. J. Riley

By his Attorneys,

H. A. Van der Cruyssen

Ca. Snow & Co.

No. 639,189.

Patented Dec. 12, 1899.

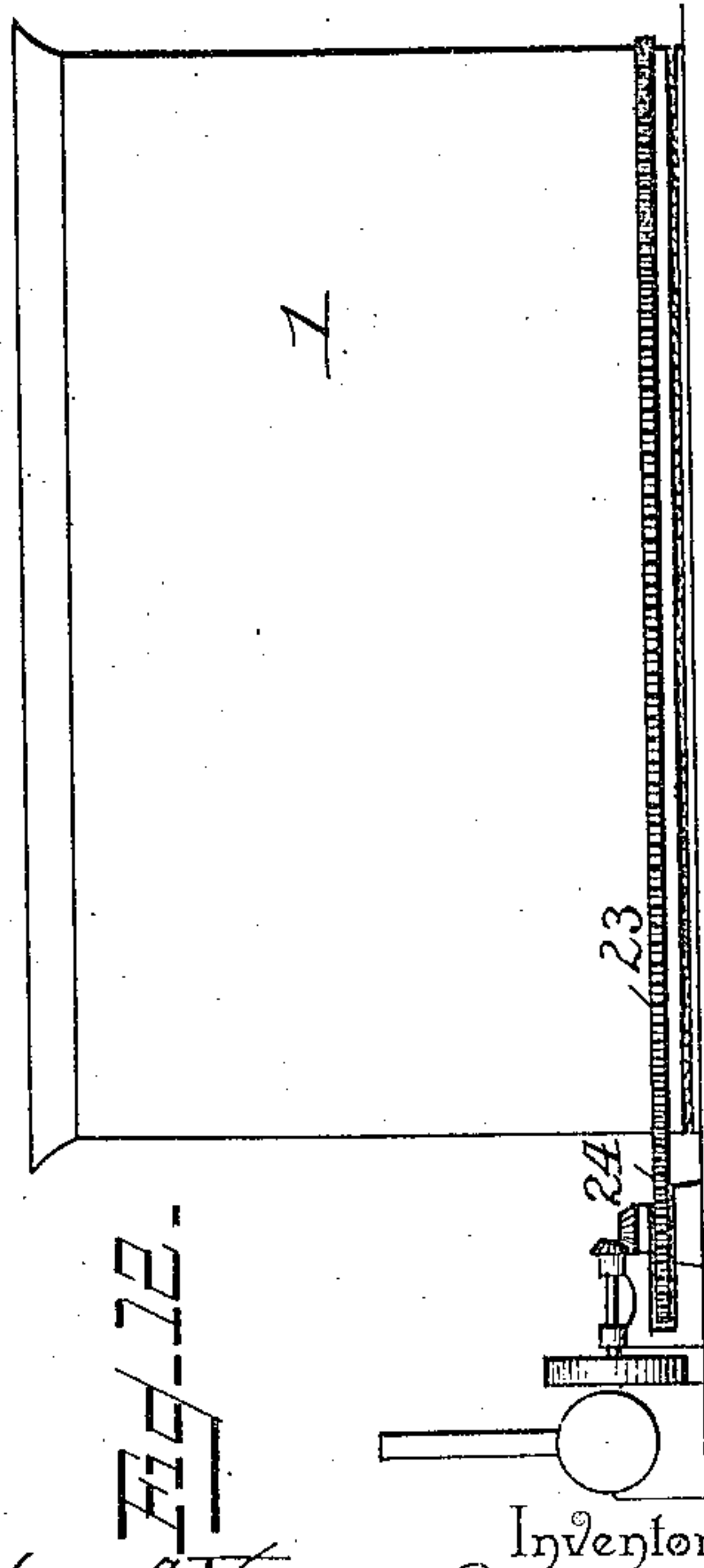
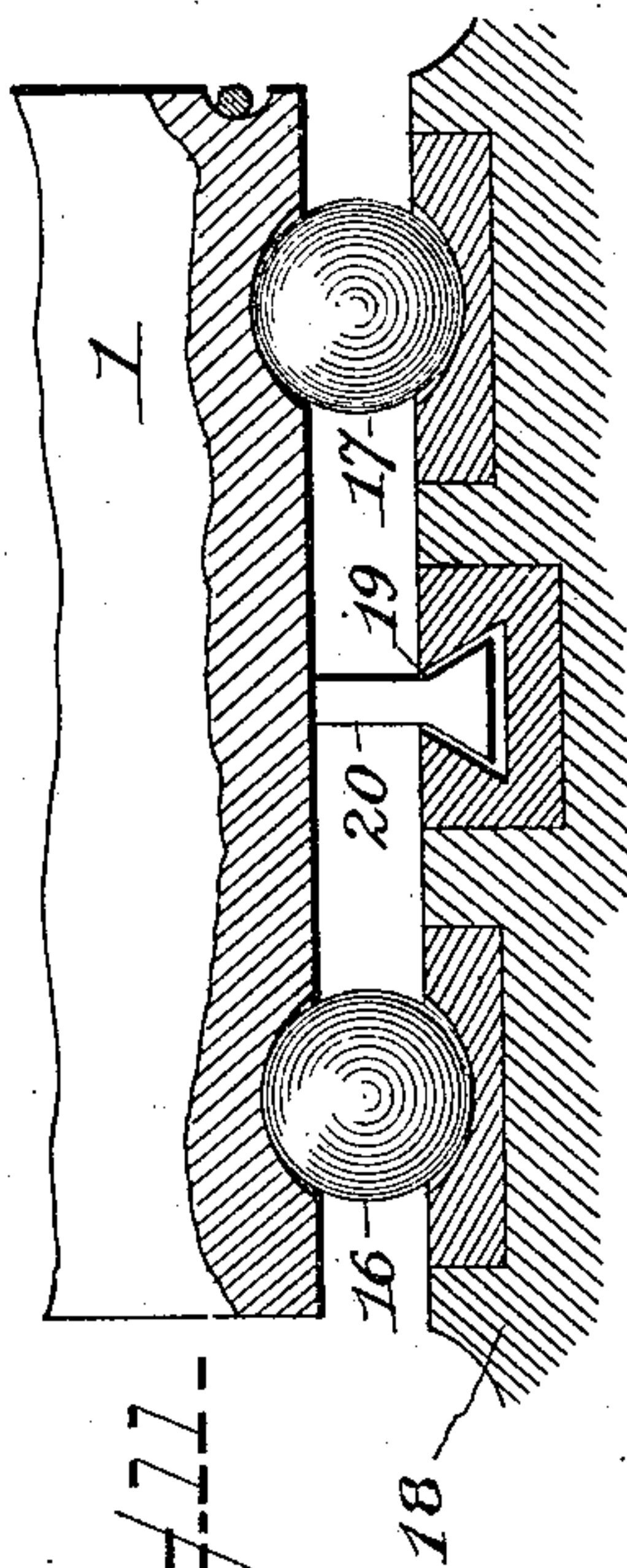
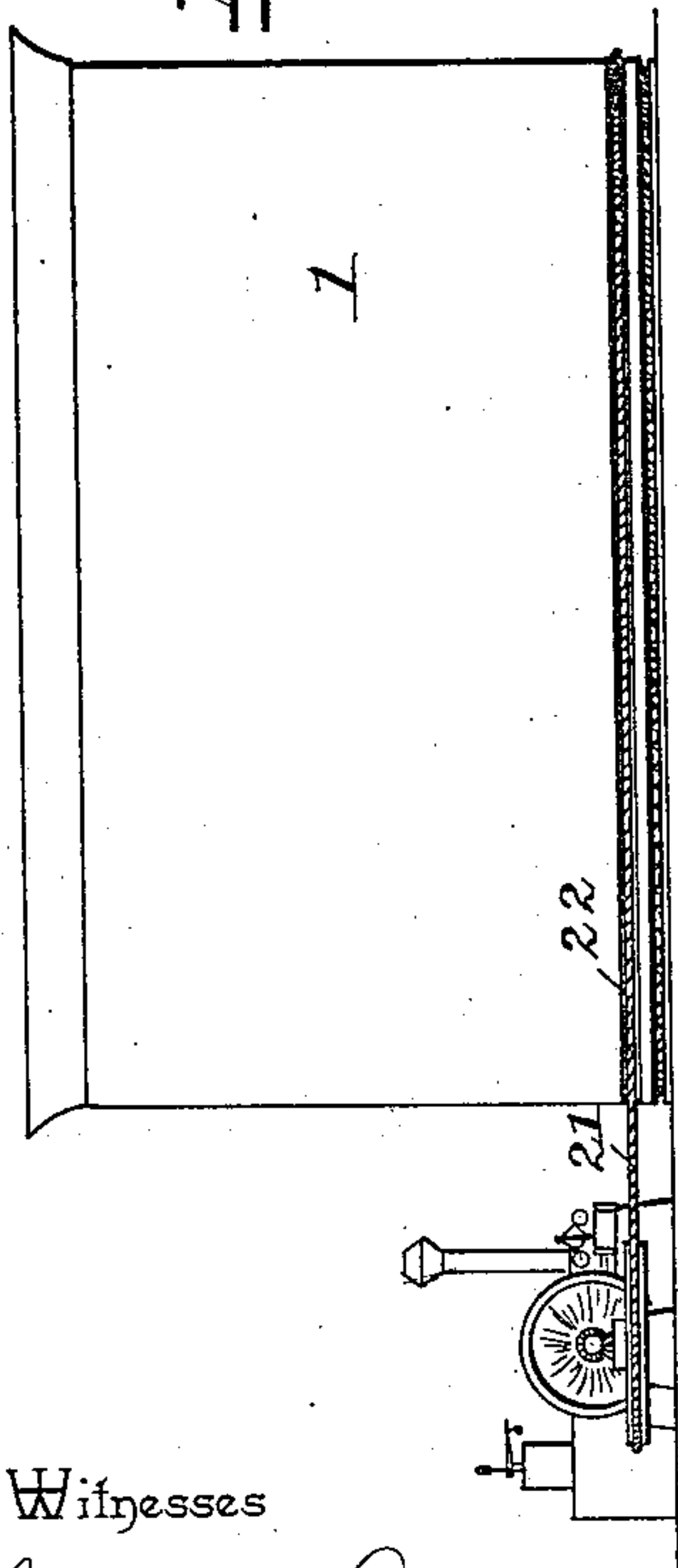
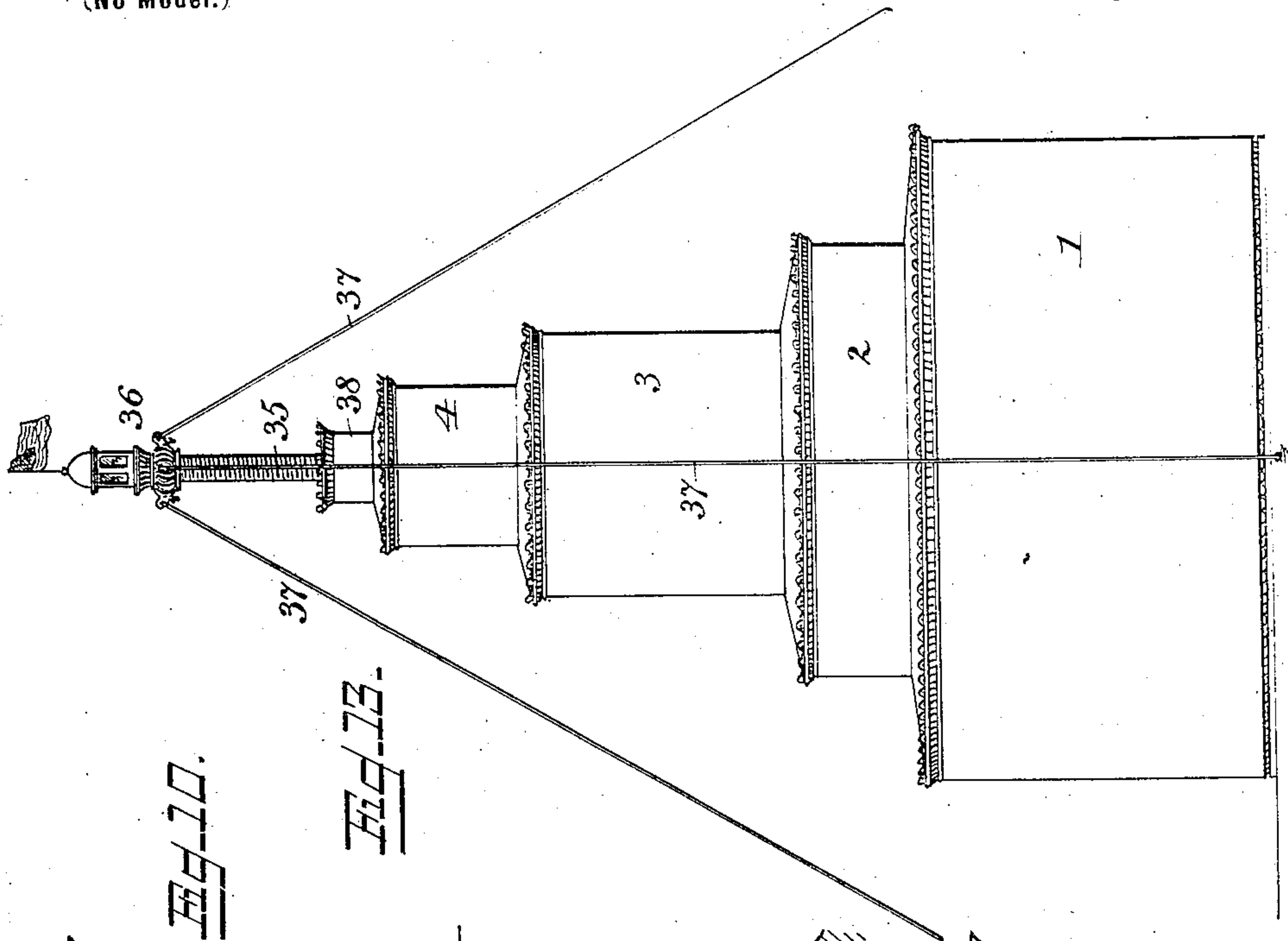
H. A. VAN DER CRUYSSSEN.

TELESCOPIC TOWER.

(Application filed Dec. 20, 1898. Renewed Oct. 27, 1899.)

(No Model.)

4 Sheets—Sheet 4.



Witnesses

Chas H. Curand
J. G. Riley

By his Attorneys,

H. A. Van der Cruysen

Inventor

C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

HENRI ALFRED VAN DER CRUYSSSEN, OF LAFAYETTE, LOUISIANA, ASSIGNOR
OF ONE-HALF TO NATHANIEL PETER MOSS, OF SAME PLACE.

TELESCOPIC TOWER.

SPECIFICATION forming part of Letters Patent No. 639,189, dated December 12, 1899.

Application filed December 20, 1898. Renewed October 27, 1899. Serial No. 734,985. (No model.)

To all whom it may concern:

Be it known that I, HENRI ALFRED VAN DER CRUYSSSEN, a citizen of the United States, residing at Lafayette, in the parish of Lafayette and State of Louisiana, have invented a new and useful Telescopic Tower, of which the following is a specification.

The invention relates to improvements in towers.

10 The object of the present invention is to improve the construction of towers and to provide a telescopic one having a series of galleries or stories in its several sections and adapted to be projected upward to elevate the
15 sections for affording the occupants a view of the surrounding scenery and capable of being readily arranged with its sections in the same horizontal plane at the surface of the ground to afford convenient ingress to and
20 egress from the several sections.

A further object of the invention is to enable the tower to rotate on its vertical axis simultaneously with the raising and lowering of the sections to afford a continual change of
25 view and to present the scenery more completely to the observers.

The invention also has for its object to construct the sections so that their overlapping portions will be hidden from view and will afford communication between the several sections, so that ingress to and egress from all parts of the tower may be had in any position of the sections in order to avoid confining persons within the structure should any accident
35 happen to the operating mechanism and leave the tower projected upward for any length of time.

Another object of the invention is to arrange the parts so that the sections will be
40 firmly supported at any elevation and present a solid structure of great stability in order that the occupants may be subjected to no danger whatever should an accident happen to the operating mechanism when the sections are in an elevated position.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed
50 out in the claims hereto appended.

In the drawings, Figure 1 is a perspective

view of a telescopic tower constructed in accordance with this invention, the sections being elevated. Fig. 2 is a vertical sectional view of the same. Fig. 3 is a similar view, the sections being lowered. Fig. 4 is an enlarged detail perspective view, partly in section, of the adjacent portions of two of the sections. Fig. 5 is a detail view illustrating the arrangement of the annular series of guide-
60 wheels. Fig. 6 is a detail perspective view of one of the sliding sleeves and a portion of the screw. Figs. 7, 8, and 9 are detail views illustrating the manner of constructing sectional screws. Fig. 10 is an elevation of the
65 lower portion of the tower, illustrating one means for operating the same. Fig. 11 is a transverse sectional view illustrating one form of bearings for mounting the lower section or body portion of the tower. Fig. 12 is
70 a view similar to Fig. 10, showing another means for operating the tower. Fig. 13 is an elevation illustrating a modification of the tower. Fig. 14 is a detail perspective view of one of the guiding and supporting brackets.
75

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a main section or body portion arranged at the base of the tower and being
80 of cylindrical or tubular form to receive sections 2, 3, and 4 of similar shape and of gradually-decreasing diameter to enable them to telescope into the bottom or main section, as clearly illustrated in Fig. 3 of the accompanying
85 drawings. Each section consists of an annular shell composed of inner and outer concentric walls and a connecting top and may be constructed of any suitable material, preferably metal and glass, and each section
90 is divided by horizontal floors or partitions into upper observation stories or galleries 4 4 and a lower blind story 5, adapted to overlap the adjacent section when the tower is elevated in order to afford communication be-
95 tween the sections when the tower is in such position. The upper stories or galleries are provided with windows, as indicated, and have doors which are adapted to aline when the sections are lowered to the same horizontal
100 plane, and suitable stairways afford communication between the stories or galleries.

The sections are also provided with suitable inner doors 6, adapted to aline with the stairs 7 of the lower or blind story 5, so that ingress to and egress from the various sections may be had in any position of the same.

The top section 4 is rigidly secured to the upper end of the vertical screw 8, which engages an interiorly-threaded female member or tube 9, located at the base of the tower and suitably fixed in the ground, whereby when the tower is rotated, as hereinafter described, the screw which rotates with the same will operate to raise and lower the sections 2, 3, and 4, as will be readily understood. The female member or tube 9 forms a nut, and a suitable well is provided for the reception of the screw when the tower is lowered, such well being preferably formed by a vertical tube or casing 10, adapted to exclude water from the screw and prevent the same from rusting. The screw, which may consist of a continuous shaft or be constructed of sections of considerable length, can also be composed of a central shaft or core 11 and short exteriorly-arranged plates 12 of semicylindrical shape, with four turns of the thread. As illustrated in Fig. 9 of the accompanying drawings, the shaft can be constructed of sections provided at their adjacent ends with sockets and connected by a screw-coupling 13, having one end fixed by a transverse fastening device 14 or other suitable means in one of the sockets and adapted to have its other end screwed into the adjacent socket of the other section of the screw.

The lower or main section, which may be supported upon wheels 15, can also be provided with a ball-bearing consisting of inner and outer annular series of balls 16 and 17, arranged in suitable ball-races of a circular track or support and in corresponding grooves or ball-races of the bottom of the lower or main section 1 of the tower. When the ball-bearing turn-table or support is employed, as illustrated in Fig. 11 of the accompanying drawings, the circular track is provided with an annular dovetailed groove 19, located at a point between and arranged concentric with the inner and outer ball-races 16 and 17 and receiving a depending guide-flange 20, which is interlocked with the base or track 18, whereby the tower is held against lateral movement. The dovetailed groove 19 has inwardly-inclined side walls, and the depending flange 20 is provided with an enlarged tapering lower edge, as shown, and it may be continuous or constructed of sections arranged at intervals.

The tower may be rotated by means of a continuous cable 21, arranged in an exterior annular groove 22, of the lower or main section 1, and connected with and operated by a suitable engine, as clearly illustrated in Fig. 10 of the accompanying drawings. Instead, however, of employing a cable positive gearing may be used, as illustrated in Fig. 12, wherein is shown a circular rack 23,

mounted on the exterior of the lower or main section 1 and meshing with a suitable gear-wheel 24, which is operated by a stationary engine and connected in any suitable manner therewith. Although only two means are illustrated for rotating the tower to raise and lower the sections, yet it will be readily understood that electric, hydraulic, and various other motive powers may be employed to effect the same result.

The blind section of each of the sections is provided with and supported by a horizontal frame or spider 25, consisting of a central sliding sleeve or hub 26 and an annular series of radial arms 27, provided at their outer ends with journals and receiving guide-wheels 28, arranged in an annular series and adapted to engage vertical guides or ways 29, disposed on the interiors of the sections, as clearly illustrated in Fig. 4 of the accompanying drawings, and these wheels which retain the section in alinement enable them to move freely and frictionlessly on each other. The ways 29 preferably consist of angle-iron tracks or girders, having grooves or ways formed by their flanges for the reception of the rims or peripheries of the wheels. The sliding sleeves or hubs are provided on their inner faces with vertical feathers or ribs 30, preferably triangular in cross-section, as shown, and engaging correspondingly-shaped ways 31, formed by notches cut in the threads of the vertical tube and arranged in alinement. By this construction the spiders or frames are interlocked with the shaft, and while they are adapted to move vertically thereon they are prevented from rotating independently of the same. The spiders or frames are constructed of metal, and in order to render them as light as possible the radial arms are tapered, as shown, and provided at their upper and lower edges with flanges, and the webs have openings varying in size, as shown.

The vertically-movable sections are provided at the tops of their blind stories with brackets 32, firmly secured to the sections and provided at opposite sides with wheels 33, preferably arranged in pairs and engaging the vertical guides or ways 29. These brackets form projections or supports and are adapted to engage projecting portions 34 of the adjacent section, the said projecting portions 34 overhanging the spaces between the sections and being located at the tops of the sections 2 and 3, so that when the tower is operated the screw will elevate the top section 4 its entire length, minus the overlapping portion, and will carry its brackets 32 into engagement with the projecting or overhanging portion 34 of the next section 3, which will be then elevated until its brackets engage the projecting portion of the section 2, when the latter will be raised. In lowering the sections the operation is reversed, all of the sections descending until the section 2 rests upon the ground, when the sections 3

and 4 will continue their descent until the section 3 arrives at the bottom of the tower, and the remaining section 4 will then be lowered by itself. Although the brackets are shown separate from the sections, yet it will be readily understood that the latter may be constructed so that such projecting portions will be integral with the structure.

In Fig. 13 of the drawings is illustrated a modification of a tower. A stationary screw 35 is employed, and this screw, which is designed to be provided with a suitable ornamental cap or head 36, is supported by guy-rods, braces, or cables 37, and the top section 15 is provided with a female screw or nut 38, which engages the screw 35 and raises and lowers the sections as the tower is rotated. This construction may be advantageously employed in the smaller class of towers and in toy structures, and a series of revolving telescoping sections and a screw for operating the same are adapted to be used in the construction of bookcases, trunks, and analogous structures.

The invention has the following advantages: The telescopic tower, which is especially designed for fairs, expositions, gardens, and other pleasure grounds and resorts, is simple and comparatively inexpensive in construction and is capable of being erected to a great height with perfect safety and of accommodating a large number of persons. The tower rotates as the sections move upward and downward and is thereby adapted to afford an ever-changing panorama, and communication is preserved between the sections, so that ingress to and egress from the same may be had in any position of the parts in order to prevent persons from being confined in the tower for any length of time should the actuating mechanism become temporarily inoperative through any form of accident.

Changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

What is claimed is—

1. A revolving tower comprising a series of telescoping sections provided with stories or compartments and adapted to be raised and lowered to uncover the compartments and to return the same, and a centrally-arranged vertical screw cooperating with the rotation of the tower and connected with and adapted to raise and lower the sections, substantially as described.

2. A revolving tower comprising a series of telescoping sections, provided with stories or compartments arranged to communicate when the sections are lowered, and means for raising and lowering the sections simultaneously with the rotation of the tower to uncover the stories or compartments and to return the same, substantially as described.

3. A tower comprising a series of telescoping sections adapted to be raised and lowered

and provided with galleries or compartments adapted to register when the sections are lowered, and means for raising and lowering the sections, substantially as described. 70

4. A tower comprising a series of telescoping sections adapted to be raised and lowered, said sections being provided with galleries or compartments arranged to communicate when the sections are lowered and extending from the top to the bottom of the tower when the sections are raised, substantially as described. 75

5. A tower comprising a series of telescoping circular sections having galleries or compartments, a turn-table or bearing supporting the bottom section, a vertical screw fixed to the top section and rotating therewith, a female member arranged at the base of the tower and engaged by the screw, and means for rotating the entire tower whereby the sections will be raised and lowered, substantially as described. 80 85

6. A rotary tower comprising a series of telescoping sections provided at their lower ends with blind stories or compartments overlapping the adjacent sections and affording communication between the sections when the tower is raised, and means for raising and lowering the tower, substantially as described. 90

7. A tower comprising a series of telescoping sections having overlapping stories or compartments provided with exit-openings, said sections having vertical series of doors or openings arranged at their inner walls and disposed in alinement with the openings of the overlapping stories or compartments, and means for raising and lowering the sections, substantially as described. 95 100

8. A tower comprising a series of telescoping sections mounted for rotation, a rotary screw connected with the top section and provided with vertical ways, and horizontal frames or spiders connected with the sections and provided with sliding sleeves or hubs arranged on the screw and interlocked with the ways thereof, substantially as described. 105 110

9. A rotary tower comprising a series of telescoping sections, a rotary screw provided with vertical ways consisting of aligned notches formed in the threads, and horizontal frames secured to the sections and provided with hubs or sleeves having ribs interlocked with the said notches, substantially as described. 115

10. A rotary tower comprising a series of telescoping sections provided at their inner faces with vertical ways, a rotary screw rigid with the top section, and a series of spiders or frames slidingly mounted on and interlocked with the screw and provided with annular series of antifriction-wheels arranged in said ways, substantially as described. 120 125

11. A tower comprising a series of telescoping sections provided at their inner faces with vertical ways, a centrally-arranged vertical screw, a series of horizontal frames or spiders composed of hubs sliding on the screw, and spokes extending radially from the hub, and 130

wheels mounted on the ends of the spokes and arranged in said ways, substantially as described.

12. A tower comprising a series of telescoping sections provided with upper projecting portions 34 arranged at their tops and extending inward, ways located at the inner faces of the sections and disposed vertically, and brackets mounted at the bottoms of the sections, provided with wheels to fit the said ways and adapted to interlock with the projections 34, substantially as described.

13. In a device of the class described, the combination of a rotary tower provided with a depending dovetailed flange and having grooves or races at opposite sides thereof, a circular base having a dovetailed groove to interlock with the said flange and provided with ball-races at opposite sides of the grooves, and balls arranged in the said races, substantially as described.

14. In a device of the class described, the combination with a rotary tower, and a base having ball-races, one of the parts being also provided with a dovetailed groove, of a dovetailed flange carried by the other part and interlocked with the groove, and balls arranged in said ball-races, substantially as described.

15. A rotary tower composed of a series of telescoping sections having compartments or galleries, and means for raising and lowering the sections as the tower is rotated, substantially as described.

16. A device of the class described comprising a rotary tower consisting of telescoping sections, and a screw connected with the sections and adapted to raise and lower the same as the entire tower is rotated, substantially as described.

17. A device of the class described comprising a rotary tower-like structure having telescoping sections or members, and means for automatically raising and lowering the sections or members when the device is rotated, substantially as described.

18. A device of the class described comprising a tower-like structure having telescoping sections or members and provided with platforms or supporting-surfaces carried by the sections or members and arranged at different elevations when the said sections or members are extended, and a screw mechanism for raising or lowering the sections or members, substantially as described.

19. A device of the class described comprising a rotary tower-like structure having telescoping sections or members, and a screw mechanism for automatically raising and lowering the sections or members when the device is rotated, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

HENRI ALFRED VAN DER CRUYSEN.

Witnesses:

R. B. MARTIN,
F. K. HOPKINS.