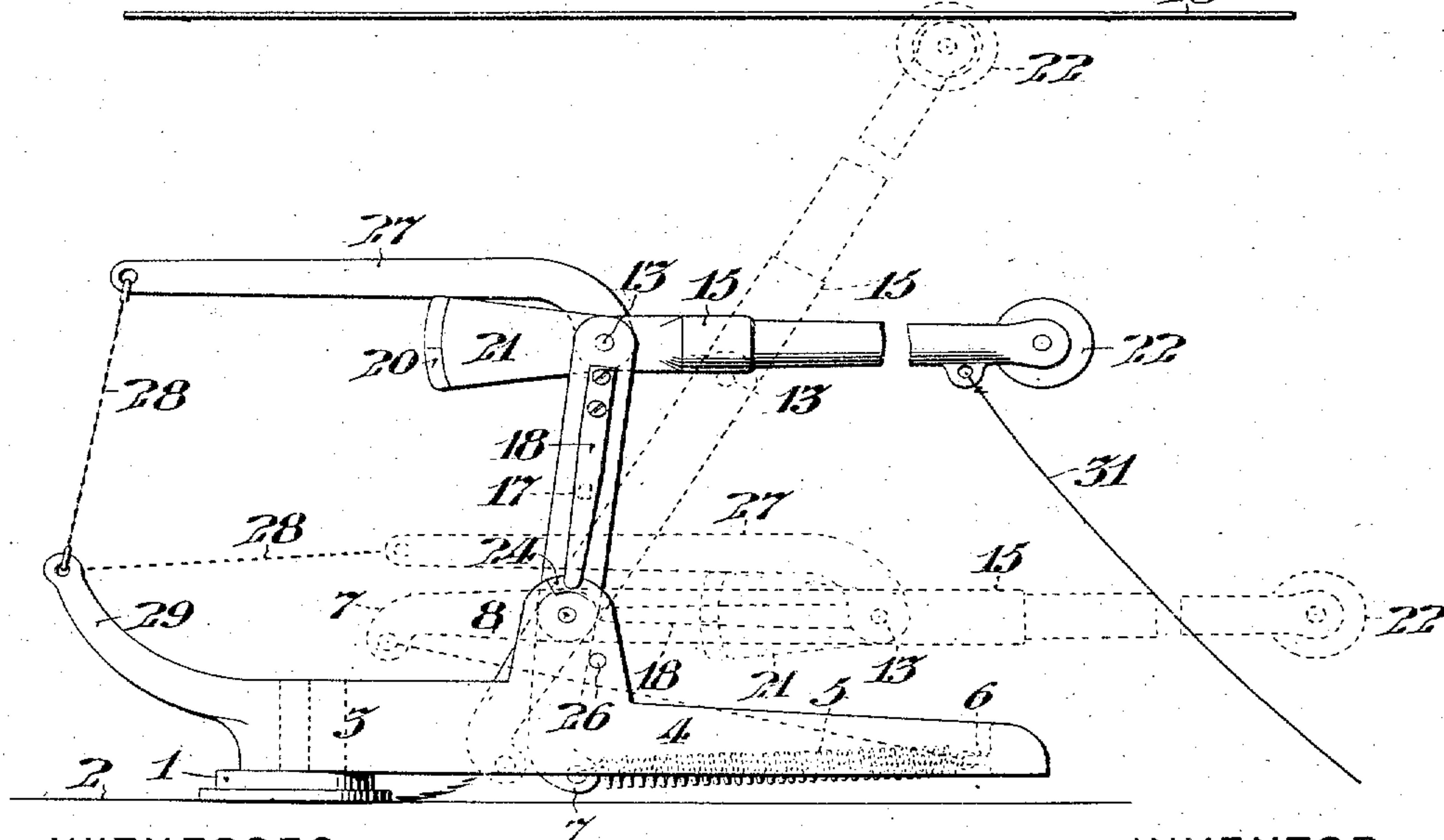
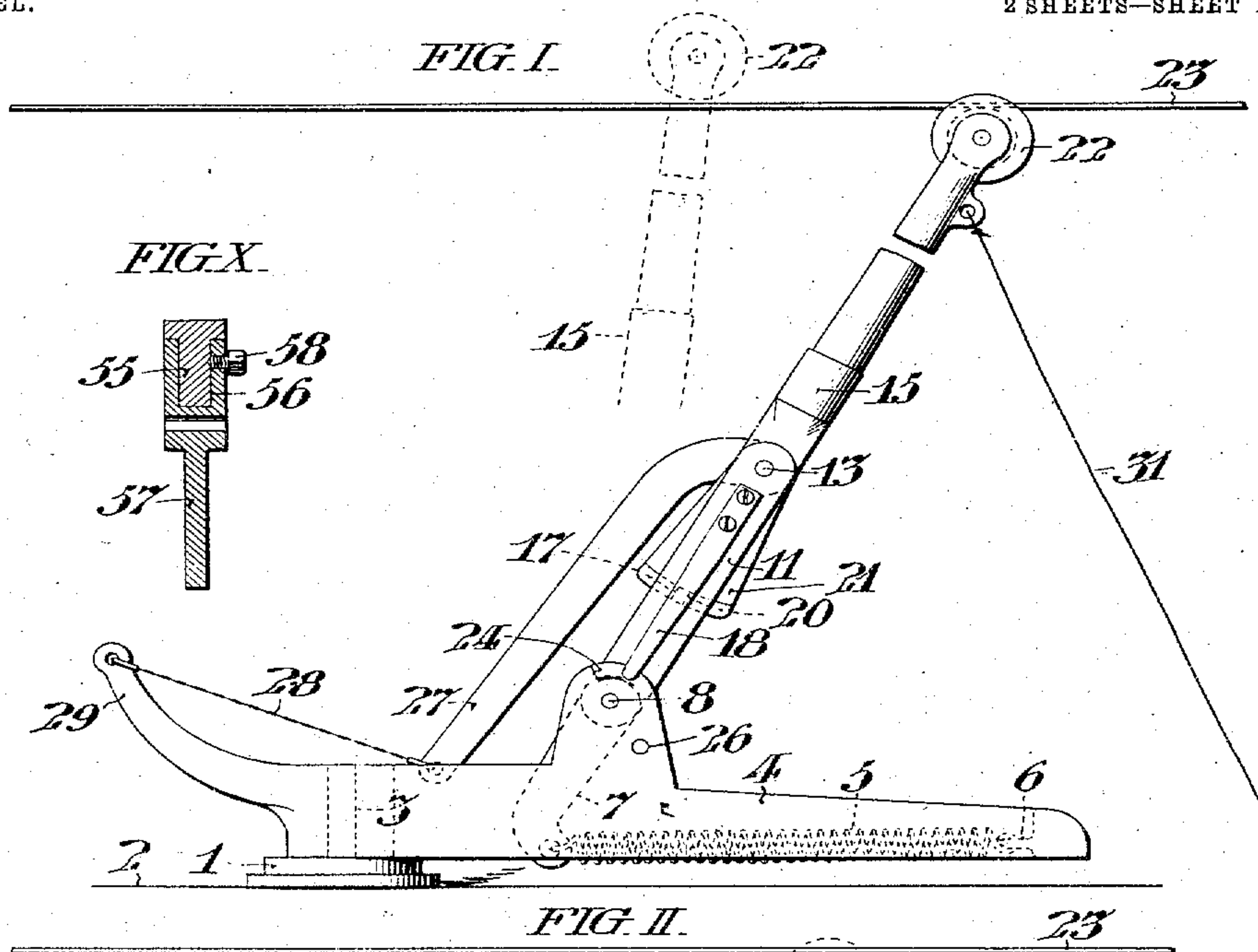


W. E. HARMON.
TROLLEY POLE.

APPLICATION FILED FEB. 9, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

Clifton C. Halliwell
John C. Dargatzis

INVENTOR:

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TROLLEY POLE.

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2 SHEETS—SHEET 2.

FIG. III.

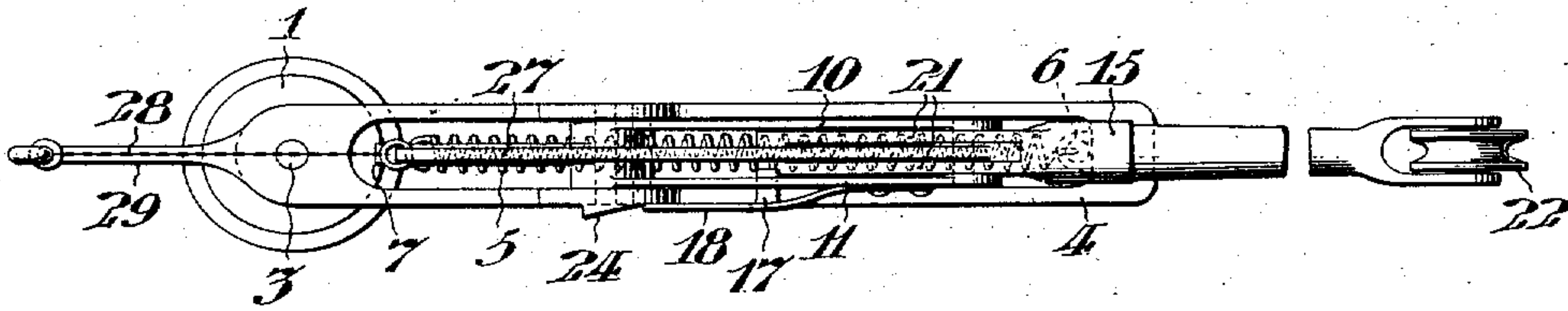


FIG. IV.

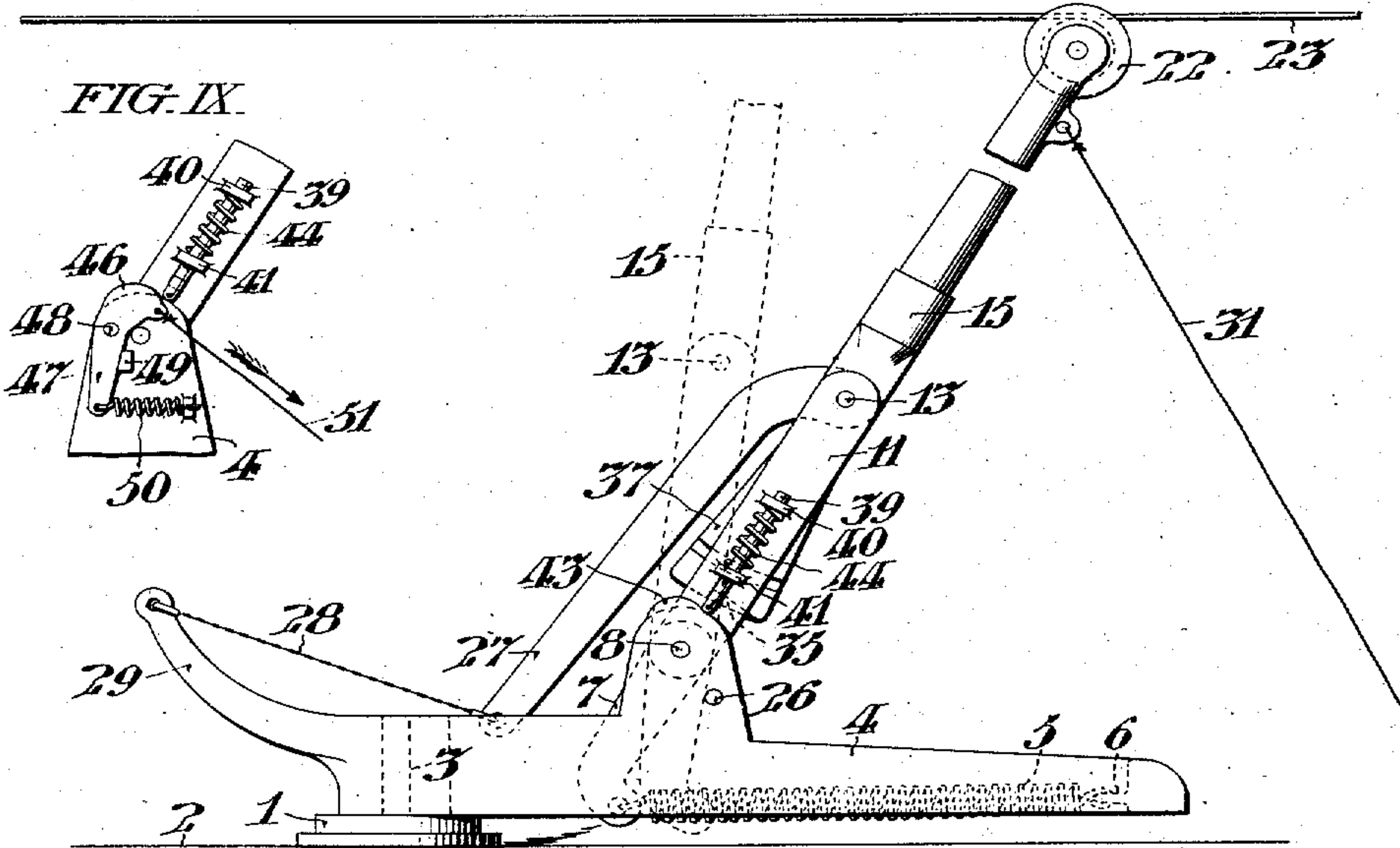


FIG. VI.

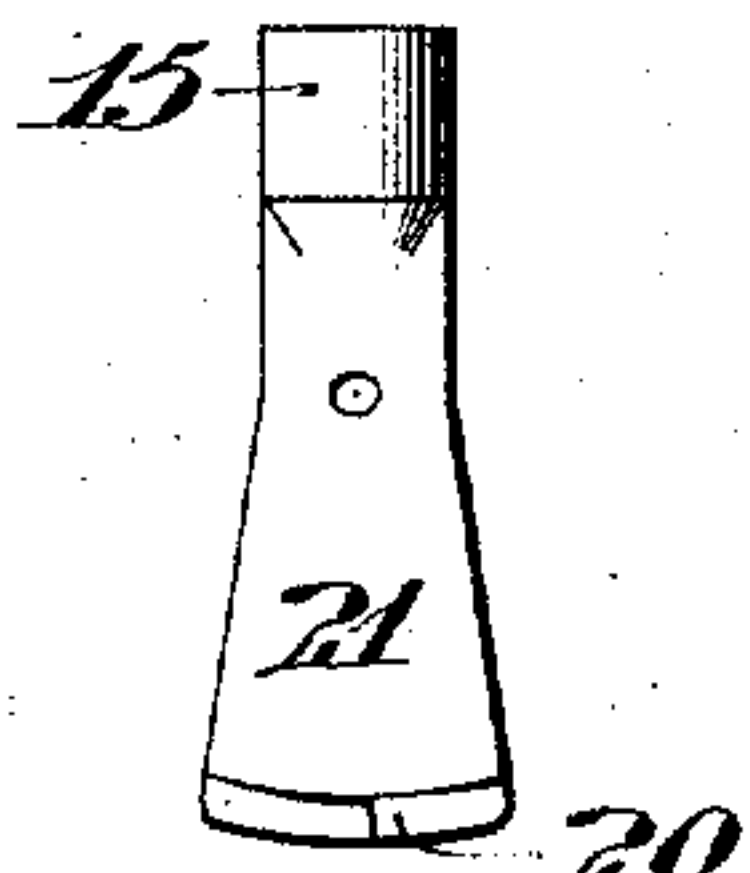


FIG. V.

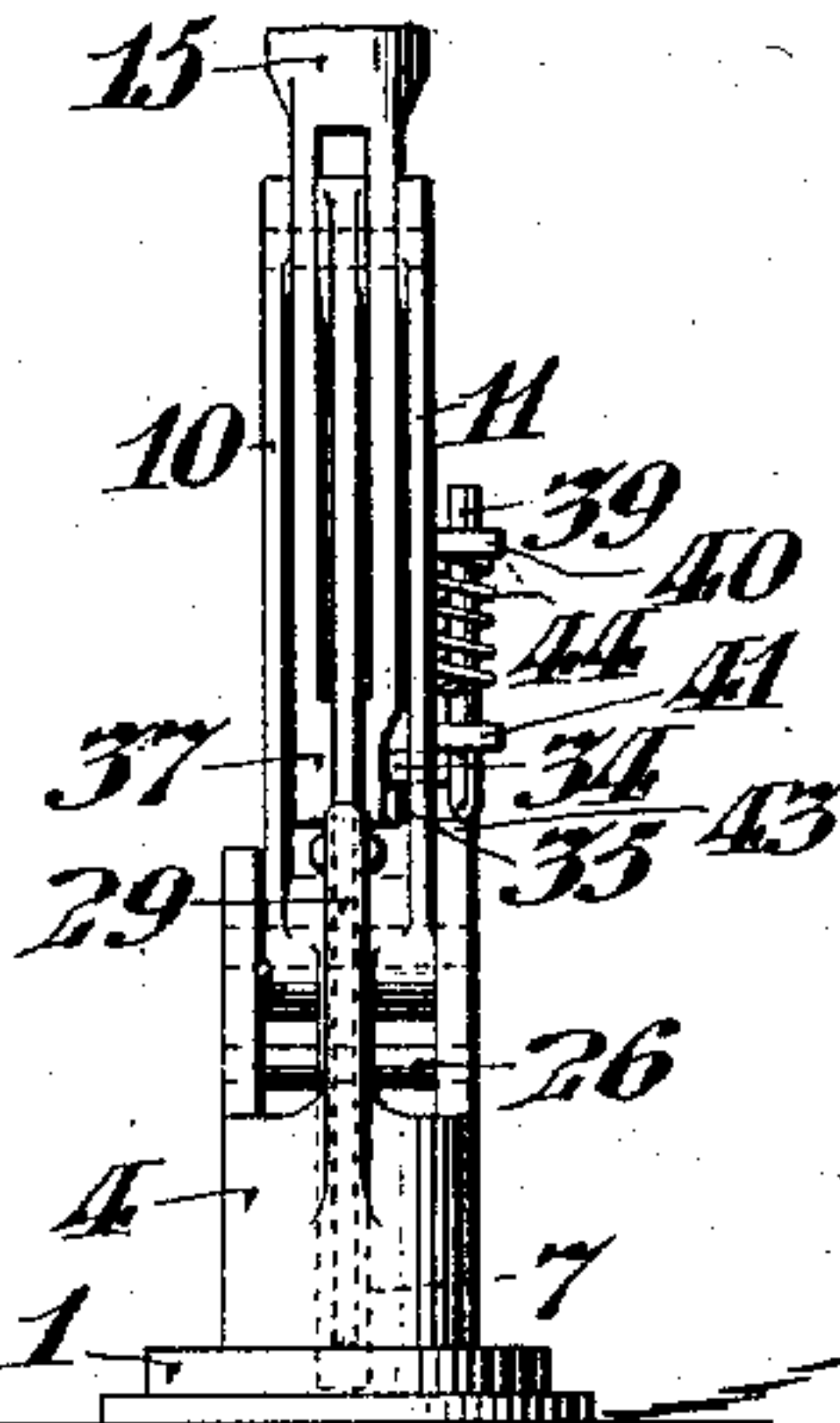


FIG. VIII.

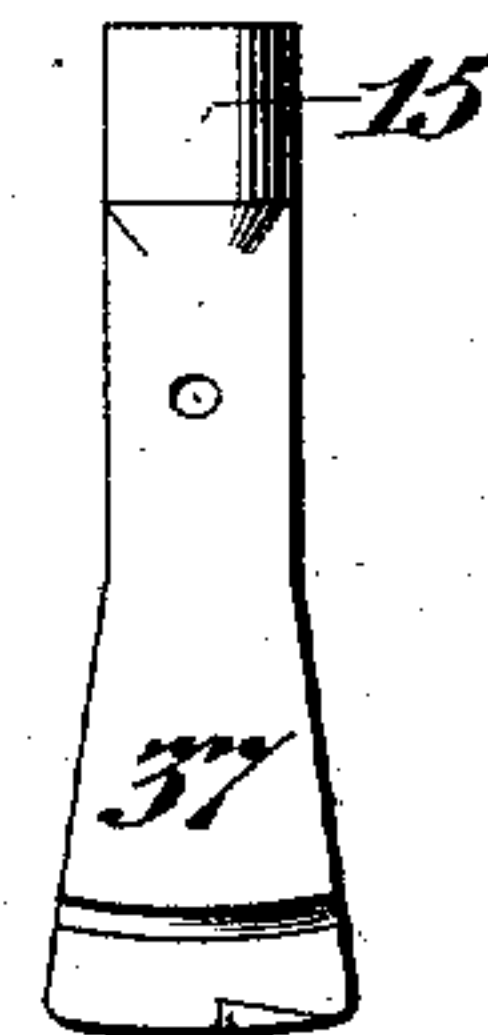


FIG. VII.

WITNESSES:

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Atty's

UNITED STATES PATENT OFFICE.

WILLIS E. HARMON, OF MECHANIC FALLS, MAINE, ASSIGNOR OF THREE-FOURTHS TO CHARLES W. ROEPPER, OF GERMANTOWN, PHILADELPHIA, PENNSYLVANIA.

TROLLEY-POLE.

SPECIFICATION forming part of Letters Patent No. 775,531, dated November 22, 1904.

Application filed February 9, 1904. Serial No. 192,732. (No model.)

To all whom it may concern:

Be it known that I, WILLIS E. HARMON, of Mechanic Falls, in the State of Maine, have invented certain new and useful Improvements in Trolley-Poles, whereof the following is a specification, reference being had to the accompanying drawings.

It is the object of my invention to provide a trolley-pole and supporting mechanism for the same so constructed and arranged that upon the pole becoming disengaged from the trolley-wire and rising above its ordinary angle with respect to the top of the car upon which the pole is mounted a releasing device will be actuated to permit the trolley-pole to fall below the level of the trolley-wire, and thus avoid damage to the latter and its supporting connections.

The form of my invention hereinafter described comprises a trolley-pole having a pivotal connection with a base-frame upon which the entire pole may oscillate while in normal engagement with the overhead trolley-wire and having a second connection between, respectively, upper and lower sections of the pole. During normal operation said sections of the pole are maintained in rigid relation by a detent which may be automatically released by a cam on the base-frame and permit the upper section of the pole to swing down with respect to its lower section when the pole accidentally rises above its normal angle.

My invention also contemplates the provision of means to render said releasing-cam idle when it is desired to permit the pole to rise above its normal angle without causing the upper section of it to fall.

My invention comprehends the various novel features of construction and arrangement hereinafter more definitely specified.

In the accompanying drawings, Figure I is a side elevation of a trolley-pole and supporting mechanism conveniently embodying my improvements in normal engagement with a trolley-wire. Fig. II is a side elevation similar to Fig. I except that the trolley-pole is in its released position consequent upon its erection to the abnormal angle indicated in dotted lines in Fig. I. Fig. III is a plan view of the

mechanism in the position shown in Fig. II. Fig. IV is a side elevation similar to Fig. I, but showing a modified form of my invention. Fig. V is a left-hand end view of the mechanism shown in Fig. IV. Fig. VI is a side elevation of the keeper-arm of the mechanism shown in Figs. I, II, and III. Fig. VII is a view of the lower edge of said keeper-arm shown in Fig. VI. Fig. VIII is a side elevation of the modified keeper-arm shown in Fig. IV. Fig. IX shows a modified form of my invention wherein the releasing-cam may be manually displaced from its normal position, so as to permit the pole to rise above its normal angle without dropping. Fig. X shows a modified form of my invention wherein the trolley-pole is detachably connected with its supporting mechanism.

Referring to the form of my invention shown in Figs. I, II, III, VI, and VII, the base-plate 1, secured upon the top of the car 2, is provided with the pivot-stud 3 for engagement with the oscillatory base-frame 4. The spring 5, engaged at one end with the lug 6 in said frame, connects at its opposite end with the spring-lever 7, which is mounted to rock upon the pivot 8 in said frame 4. The arms 10 and 11, which extend in rigid relation with said lever 7, form the lower section of the trolley-pole carrying the pin 13, upon which the upper section 15 of said pole is pivotally connected. The aforesaid pivotally-connected sections of the trolley-pole are normally maintained in rigid relation by the detent 17 on the spring 18, which tends to engage it with the lug 20 on the keeper-arm 21, carried by the pole-section 15 below the pivot-pin 13.

Referring to Fig. I, the angular position of the trolley-pole shown in full lines is that which it assumes when its wheel 22 is in normal engagement with the trolley-wire 23, and the cam 24 upon the frame 4 above the pivot-pin 8 is so constructed and arranged as to thrust the spring 18 outwardly, and thus release the detent 17 from the lug 20, when the pole rises to the position indicated in dotted lines in Fig. I, with the lever 7 against the stop-bar 26, which latter position may be as-

sumed when said trolley-wheel is accidentally disengaged from the trolley-wire.

Upon the disengagement of the detent 17, as above described, the upper section 15 of the trolley-pole is free to fall to the position shown in full lines in Fig. II below the level of the trolley-wire 23, and such downward movement of said pole-section 15 is checked, as shown in Fig. II, by the arm 27, whose free extremity is secured by a chain or other suitable flexible connector 28 to the arm 29 upon said base-frame 4.

It may be noted that although in the operation above described the arm 27 operatively connects the chain 28 with the upper section 15 of the pole and checks the downward movement of the latter by encountering the keeper-arm 21, as shown in Fig. II, said arm 27 being pivotally connected with the upper pole-section by the pin 13 does not limit the upward movement of said pole, for, as indicated in Fig. I, said arm 27 swings outwardly with respect to the pole as the latter rises.

The upper and lower sections of the trolley-pole may be restored to their normal rigid relation by drawing down the upper section 15 conveniently by the rope 31 to the lower position shown in dotted lines in Fig. II, wherein the detent 17 resumes its engagement with the lug 20 on the keeper-arm 21. Thereupon by releasing said rope 31 the pole may be allowed to resume its normal engagement with the trolley-wire 23, as indicated by the upper dotted lines in Fig. II, which correspond with the position of said pole shown in full lines in Fig. I.

In the form of my invention shown in Figs. IV, V, and VIII the upper and lower sections of the trolley-pole are normally maintained in rigid relation by the engagement of the detent 34 with the lug 35 on the keeper-arm 37, which latter is carried by the upper section of said pole. Said detent 34 is carried by the slide-bar 39, which is mounted to reciprocate in the bearings 40 41 on the lower section of the pole shown in Fig. IV, so that when the pole rises to the abnormal position indicated in dotted lines in Fig. IV the lower extremity of said bar 39 rides up the releasing-cam 43 on the frame 4 until the detent 34 is above the lug 35 upon the keeper-arm 37 and permits the upper section of the pole to fall below the level of the trolley-wire 23 in the manner described with reference to Fig. II. When free of said cam 43, said slide-bar 39 is restored to its normal position (shown in Fig. IV) by the spring 44.

In order to permit a trolley-pole jointed as above described to be uplifted to the abnormal position indicated in dotted lines in Fig. I without permitting its upper section to fall, I find it convenient to provide releasing means, such as are shown in Fig. IX, wherein the cam 46, which otherwise operates like the cam 43, is carried by a lever 47, pivoted on a stud

48, projecting from the side of the base-frame 4. Said cam 46 being normally maintained in its operative position against the lug 49 by the spring 50, as shown, the lever 47 may be tilted to remove said cam from the range of movement of the slide-bar 39 by drawing the cord 51 in the direction indicated by the arrow. After the desired manipulation of the pole, with said cam 46 in inoperative position, said cam-lever 47 may be released and returned to its normal operative position by the spring 50.

Although I have shown the lower section of the trolley-pole in permanent connection with the spring-lever 7 in Fig. I, &c., it is to be understood that a jointed trolley-pole provided with means for normally maintaining its two sections in rigid relation and permitting them to be swung relatively to each other under abnormal conditions may have its lower section provided with a shank 55, as shown in Fig. X, for engagement in a corresponding socket 56 in a spring-lever 57, which otherwise is constructed and arranged like the spring-lever 7 shown in Fig. I. Said pole-shank 55 may be detachably secured in rigid relation with said spring-lever 57 by the set-screw 58, as indicated in Fig. X. It may also be noted that although I find it convenient to make the arm 27 (shown in Fig. I, &c.) primarily separate from the pole and to independently mount it upon the pivot 13, so as to control the pole-sections 15 by contact with the corner of the keeper-arm 21, said arm 27 may be rigidly connected with said keeper-arm 21 or with the pole-section 15, whose movement it serves to limit.

I do not desire to limit myself to the precise details of construction and arrangement hereinafter described, as it is obvious that various modifications made without departing from its essential feature.

I claim—

1. The combination with a trolley-pole provided with a pivotal connection; of a detent rendering said connection idle; means arranged to automatically release said detent; and, adjustable means to render said releasing means idle, substantially as set forth.

2. The combination with a trolley-pole provided with a pivotal connection; of a detent normally rendering said connection inoperative; a cam arranged to automatically release said detent; and, manually-operative means to render said releasing-cam idle, substantially as set forth.

3. The combination with a base-frame; of a spring attached to said base-frame; a lever operatively engaged with said spring; a trolley-pole carried by said spring-lever, comprising pivotally-connected upper and lower sections; a detent normally maintaining said sections in rigid relation; means arranged to automatically release said detent; an arm extending from the pivotal connection of said pole-sections

tions; and, a flexible connector extending from the free end of said arm to said base, substantially as set forth.

4. The combination with a base-frame; of a spring attached to said base-frame; a lever operatively engaged with said spring; a trolley-pole carried by said spring-lever, comprising pivotally-connected upper and lower sections; a detent normally maintaining said sections in rigid relation; means carried by said base-frame arranged to automatically release said detent; an arm extending from the pivotal connections of said pole-sections; and, a flexible connector extending from the free end of said arm to said base, substantially as set forth.

5. The combination with a trolley-pole provided with a pivotal connection, of a detent normally rendering said connection inoperative; and, an adjustable cam arranged to automatically release said detent, substantially as set forth.

6. The combination with a trolley-pole comprising respectively upper and lower sections pivotally connected; of a detent rendering said connection normally inoperative; means arranged to automatically release said detent; a base-frame; and, a second pivotal connection between the lower section of said pole and said base-frame; the construction being such that said detent may be reset by traction upon the upper section of said pole, substantially as set forth.

7. The combination with a trolley-pole comprising respectively upper and lower sections pivotally connected; of a detent rendering said connection normally inoperative; means arranged to automatically release said detent; a base-frame; a second pivotal connection, between the lower section of said pole and said base-frame; and, a flexible connector having its opposite ends respectively connected to the upper section of said pole and to said base-frame, arranged to limit the fall of said upper section with respect to said base-frame, substantially as set forth.

8. The combination with a trolley-pole provided with a pivotal connection; of a detent rendering said connection normally inoperative; means arranged to automatically release said detent and permit the pole to fall below its normal position; a base-frame; and means limiting the downward movement of the pole comprising an arm having one end pivotally connected with said pole and its opposite end connected with said base-frame, substantially as set forth.

In testimony whereof I have hereunto signed my name, at Philadelphia, Pennsylvania, this 6th day of February, 1904.

WILLIS E. HARMON.

Witnesses:

JAMES H. BELL,
E. L. FULLERTON.

Corrections in Letters Patent No. 775,531.

It is hereby certified that in Letters Patent No. 775,531, granted November 22, 1904, upon the application of Willis E. Harmon, of Mechanic Falls, Maine, for an improvement in "Trolley-Poles," errors appear in the printed specification requiring correction, as follows: On page 2, line 106, after the word "modifications" the words *may be* should be inserted, and in line 107, same page, the misspelled word "featurse" should read "*features*"; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 6th day of December, A. D., 1904.

[SEAL.]

F. I. ALLEN,
Commissioner of Patents.

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4. The combination with a base-frame; of a spring attached to said base-frame; a lever operatively engaged with said spring; a trolley-pole carried by said spring-lever, comprising pivotally-connected upper and lower sections; a detent normally maintaining said sections in rigid relation; means carried by said base-frame arranged to automatically release said detent; an arm extending from the pivotal connections of said pole-sections; and, a flexible connector extending from the free end of said arm to said base, substantially as set forth.

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