(No Model.) 4 Sheets—Sheet 1.

C. B. PRICE.

FROGLESS SWITCH.

No. 353,002. Patented Nov. 23, 1886.

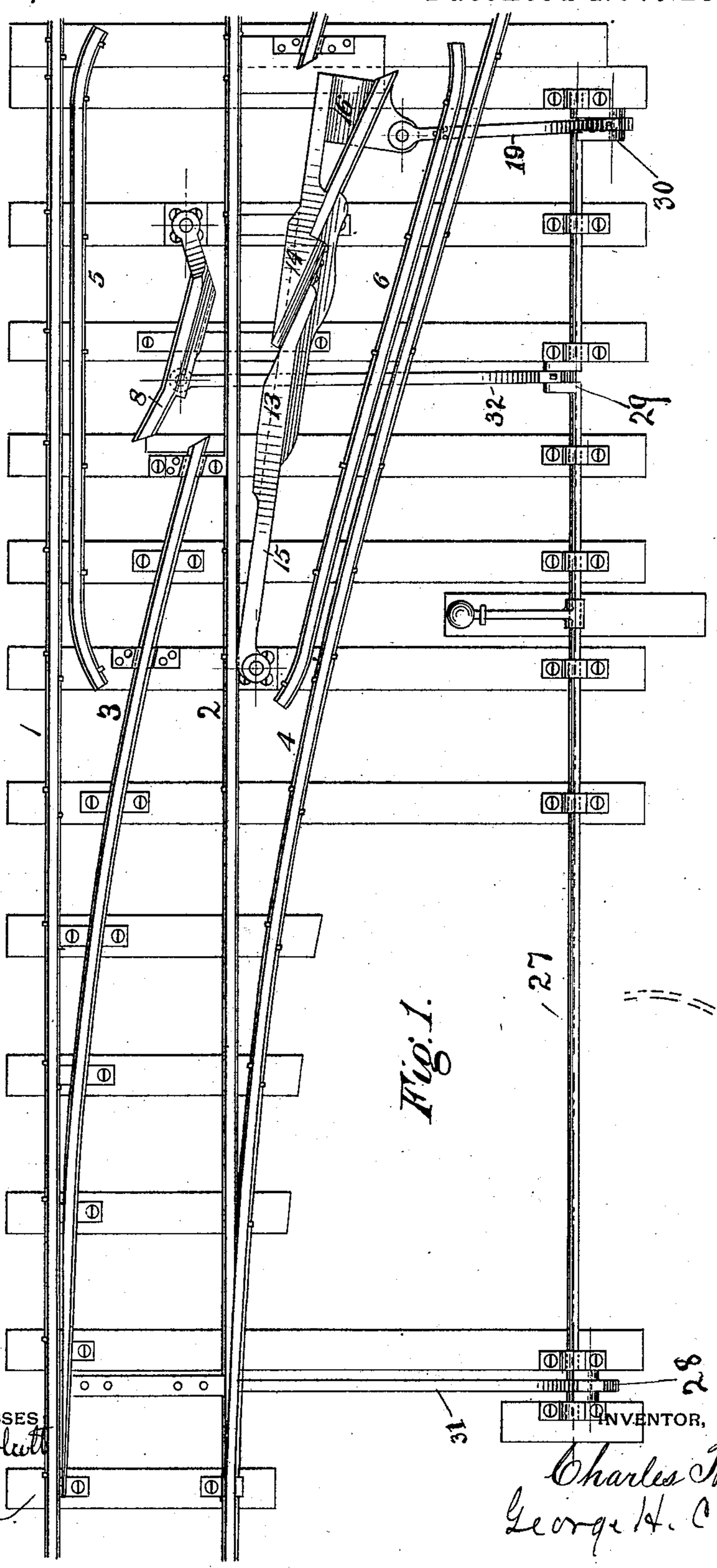


Fig. 1.

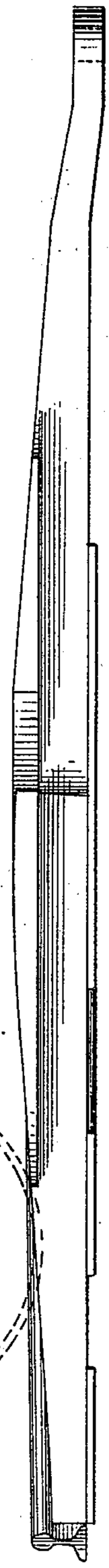


Fig. 2.

WITNESSES:
Damon S. Wolcott
C. M. Clarke

INVENTOR,
Charles B. Price
George H. Christy
Att'y.

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 4 Sheets—Sheet 2.

C. B. PRICE.

FROGLESS SWITCH.

No. 353,002. Patented Nov. 23, 1886.

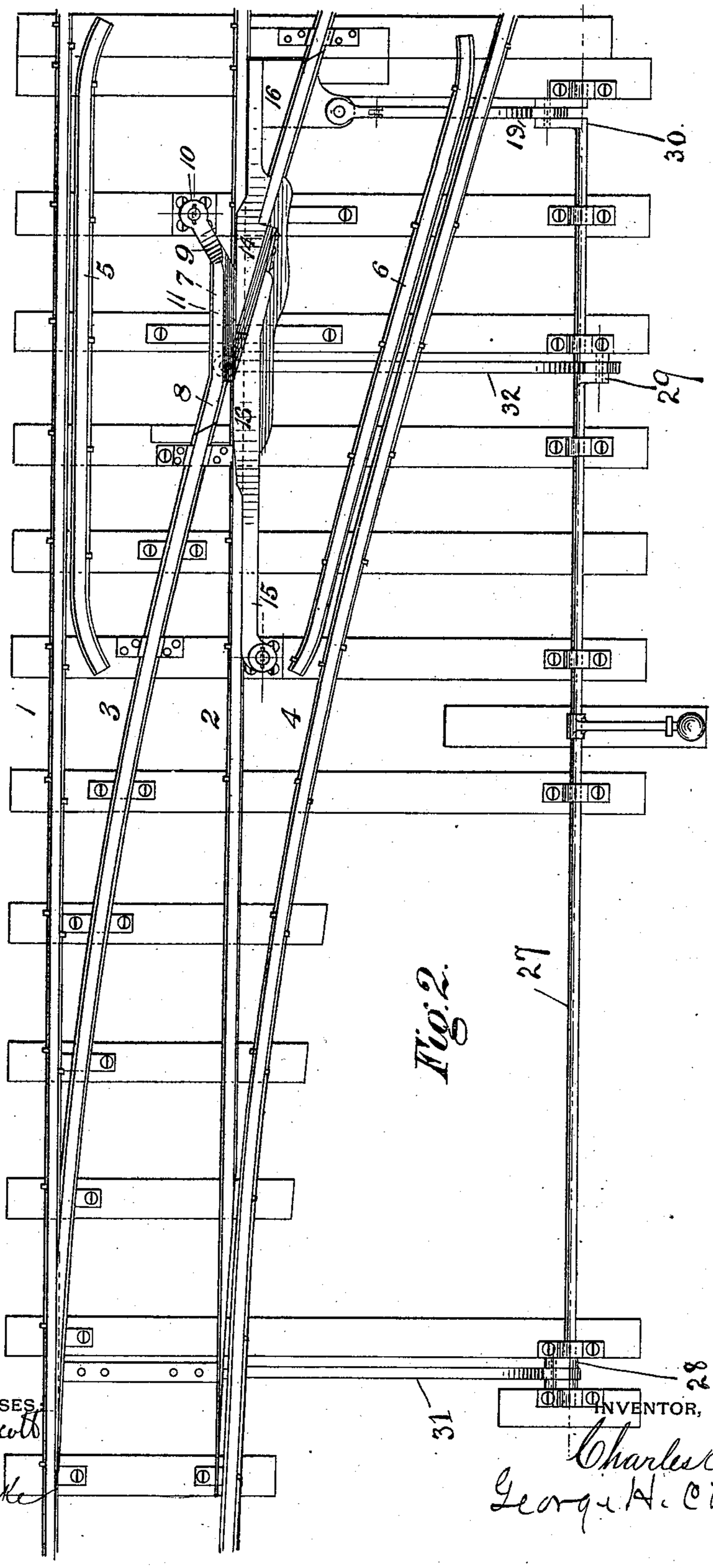


Fig. 2.

WITNESSES:
Dawin S. Wolcott
L. M. Clarke

INVENTOR,
Charles B. Price
George H. Christy
Att'y.

(No Model.) 4 Sheets—Sheet 3.

C. B. PRICE.

FROGLESS SWITCH.

No. 353,002. Patented Nov. 23, 1886.

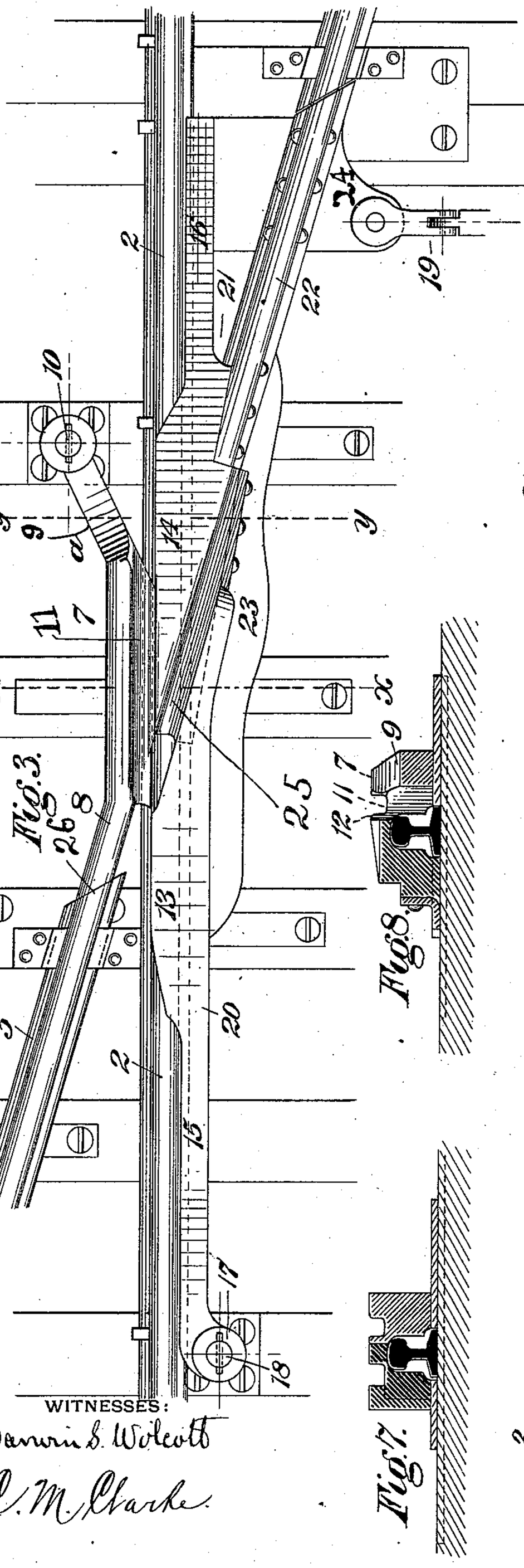


Fig. 3.

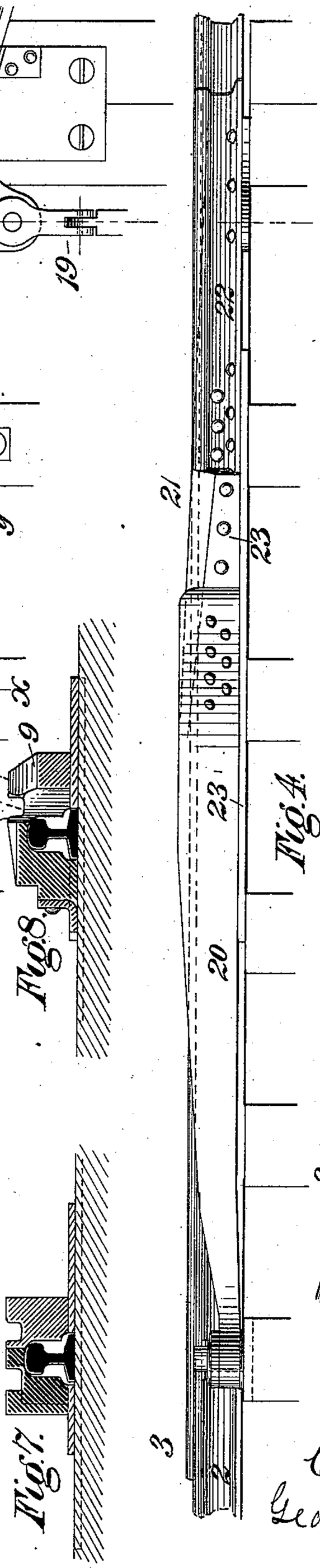


Fig. 8.

Fig. 7.

Fig. 4.

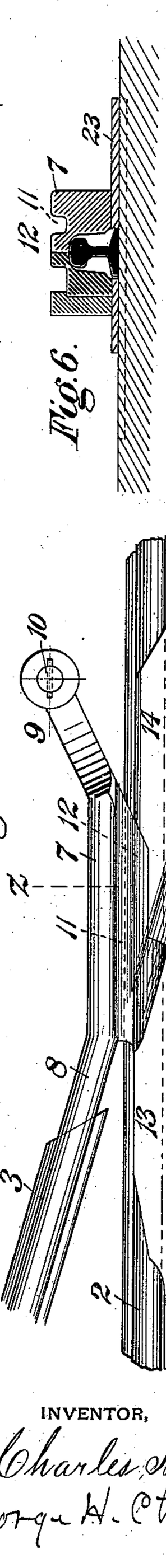


Fig. 6.

Fig. 5.

WITNESSES:

Darwin S. Wolcott

C. M. Clarke.

INVENTOR,

Charles B. Price

George H. Christy Att'y.

(No Model.)

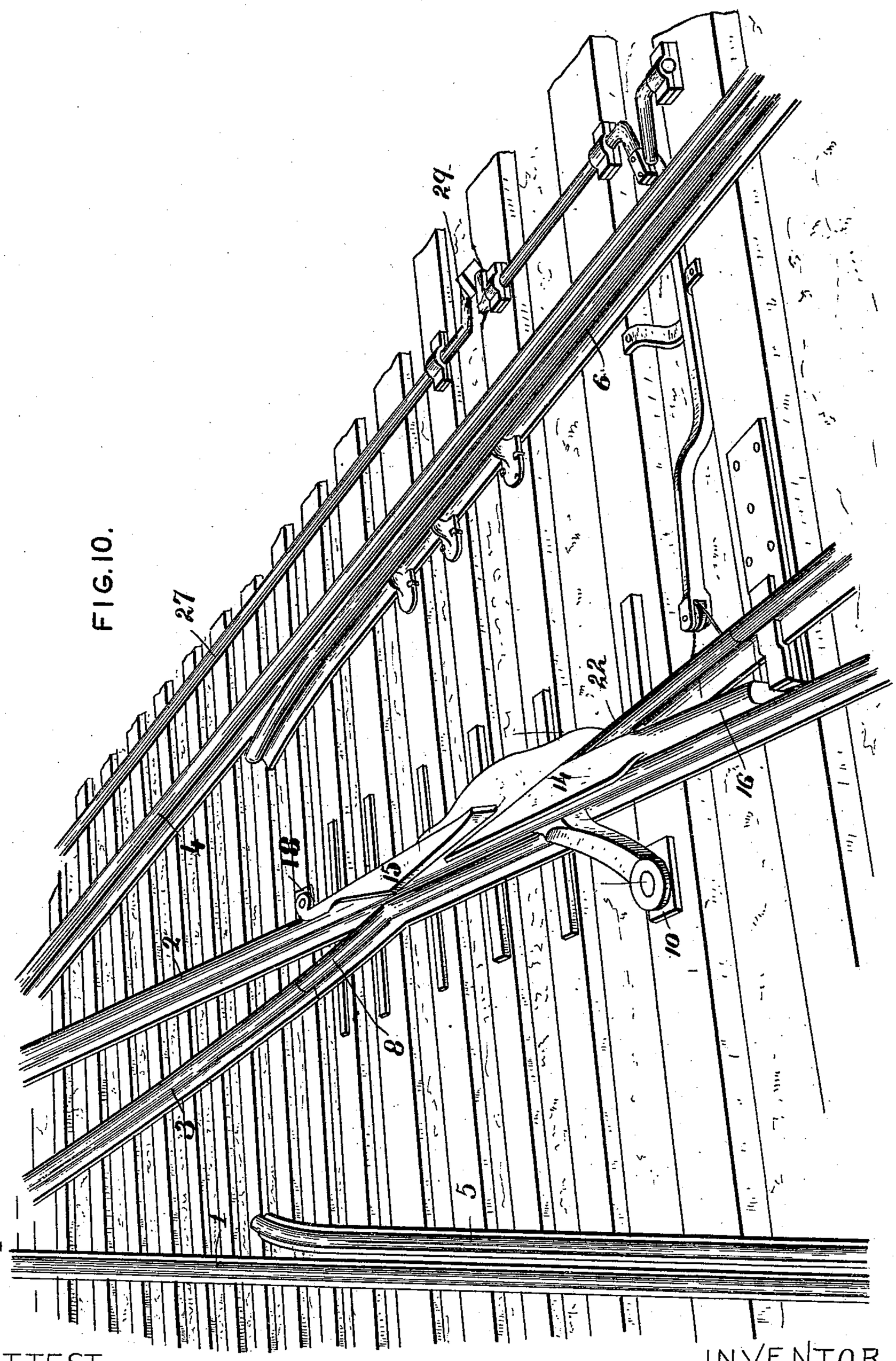
4 Sheets—Sheet 4.

C. B. PRICE.

FROGLESS SWITCH.

No. 353,002. Patented Nov. 23, 1886.

FIG. 10.



ATTEST.

J. Henry Kaiser

Wm. A. Scott

INVENTOR

Charles B. Price

By Darwin S. Wolcott

Asst. Atty.

UNITED STATES PATENT OFFICE.

CHARLES B. PRICE, OF PITTSBURG, PENNSYLVANIA.

FROGLESS SWITCH.

SPECIFICATION forming part of Letters Patent No. 353,002, dated November 23, 1886.

Application filed May 1, 1886. Serial No. 200,894. (No model.)

To all whom it may concern:

Be it known that I, CHARLES B. PRICE, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in Frogless Switches, of which improvement the following is a specification.

In the accompanying drawings, which make part of this specification, Figure 1 is a plan view of a railway switch or siding having my improved movable frog embodied therewith, the switch being shown closed to the siding and the frog clear of the main rails. Fig. 2 is a similar view, the switch being shown open to the siding and the movable frog in position. Fig. 3 is a plan view of the movable frog on an enlarged scale. Fig. 4 is a view in side elevation of the frog, looking in the direction of the arrow *a*, Fig. 3. Fig. 5 is a view similar to Fig. 3, showing a modification of the frog. Fig. 6 is a sectional view on the line *z z*, Fig. 5. Figs. 7 and 8 are similar views in the lines *x x* and *y y*, respectively, of Fig. 3. Fig. 9 is a view in side elevation of the movable frog, looking toward the inner side thereof. Fig. 10 is a perspective view of a portion of a railway, showing my improved frogless switch.

The invention herein relates to certain improvements in that class or kind of switches in which an unbroken main-line rail is preserved, special reference being had to that peculiar construction and arrangement of switch shown, described, and claimed in Letters Patent No. 310,613, January 13, 1885, No. 323,569, August 4, 1885, and No. 335,238, January 2, 1886, which have been granted to me.

In each of the above-mentioned patents provision is made for raising up the wheels of cars passing to and from the siding to such a height that the flanges of the wheels will ride over the main rail, and at the same time a practically clear main line will be preserved for the passage of trains therealong while the frog-rail is in position for the siding. While the construction and arrangement of switch set forth in said patents are effective in producing the desired result, they are open to certain objections in practical operation—as, for example, the safety-wings of the crossing-frog, which are of necessity very thin at their extremities, in order that wheels passing along the main track may meet with as slight obstruction as possible, might in use be broken off by sudden blows from passing wheels. Another feature which might be objectionable is the position of the frog across the line of the leading-in rail when the switch is closed or set for main line, so that in case the frog is moved before the car-wheels entering the switch have passed over the movable frog the wheels will strike the frog and either break it or be derailed.

The object of the invention herein is to provide for the raising of the car-wheels to the desired height in passing along the main line when the switch is open or set for siding without injuriously weakening the safety-wings; to provide such a movement for the frog that it will be entirely out of the line of the leading-in rail when the switch is closed or set for main-line; to provide a practically continuous tread for the wheels while passing from the leading-in rail to the frog, and to provide a movable leading-in-rail section in order that the same may be moved entirely away from the main rail when the switch is closed or set for main line; and to these ends the invention consists, in general terms, in the construction and combination of parts, substantially as hereinafter described and claimed.

The main rails 1 and 2 and the switch-rails 3 and 4 are arranged as customary in switches or sidings, and adjacent to the point where the leading-in rail 3 crosses the main rail 2 are arranged the guard-rails 5 and 6, alongside the main rail 1 and the outer switch-rail, 4. In lieu of extending the inner end of the leading-in rail 3 close up to the main rail 2 at the point of crossing, a movable section is arranged between the end of the rail 3 and the main rail 2. This rail is so constructed that the main or body portion 7 thereof will, when in operative position, lie close alongside of the main rail, and is of such a height that when the tread of a wheel is resting thereon the flange will be slightly above the tread of the main rail. The forward end of the portion 7 is provided with an extension, 8, arranged at such an angle to the portion as to be when in operative position in line with the rail 3, forming a continuation of said rail. The rear end of the mova-

ble rail 7 is provided with a vertically-inclined and angular extension, 9, having an eye at its end, through which passes the pin 10, on which the movable section 7 turns as a pivot. Along the inner edge of the movable section 7 is formed a groove, 11, for the passage of the flanges of car-wheels moving along the main line when the swich is open or set for siding. Ordinarily the rib 12 lies alongside or very slightly over the tread of the main rail when the section 7 is in operative position, as shown in Figs. 7 and 8; but, if desired, said section may be widened, so that the rib will extend farther over the main rail, as shown in Figs. 5 and 6.

The movable frog A is constructed somewhat similar to the frog shown and described in the Letters Patent above referred to, having the safety-wings 13 and 14, constructed as set forth in said patents, to extend over and rest upon the main rail 2 when the switch is open or set for siding; but in lieu of said wings being tapered down to a thin or knife edge at their ends, so as to form an inclined or wedge-like path for the car-wheels, said wings are made comparatively short and are only slightly inclined, thus leaving the wings comparatively thick at their ends, and thereby avoiding any liability of breakage by the passage of wheels. Provision is made for the gradual raising of passing wheels to the desired height by extensions 15 and 16 from the ends of the wings, said extensions being constructed to rest against the outer side of the main rail, as shown in Figs. 2, 3, and 6, and being inclined upwardly from their outer ends, which are made of a height slightly less than the height of the main rail, as shown in Figs. 4 and 9. These extensions 15 and 16 have a firm bearing on the cross-ties or upon plates fastened thereon, and are so proportioned as to engage the outer edges of the tread of the car-wheels and raise them an inch (more or less) above the tread of the main rail before said wheels engage or bear upon the wings 13 and 14.

In the patents above referred to the frog is shown pivoted at its rear end adjacent to the end of the inner switch-rail. If in such an arrangement the switch should be thrown before the last pair of wheels of any trains entering the switch has passed over the movable frog, the latter will be thrown across the path of the wheels on the leading-in rail at such an angle as to insure a derailment of the wheels, if not the destruction of the frog.

I now propose to pivot the movable frog at its point—*i. e.*, the end toward the switch-points—for which purpose the forward wing-extension, 16, is provided with an eye, 17, for the reception of the pivot-pin 18, secured to one of the cross-ties, the operating-rod 19 being connected to the movable frog at or near its rear end. In this arrangement the frog is thrown entirely out of the path of wheels moving along the leading-in rail 3 in case of premature shifting of the switch, and in such case the wheels will, with the help of the guard-rail 6, be kept in line with the siding-rails and have an opportunity of regaining the track after jumping across the main rail 2.

The movable frog proper is preferably made of three or more parts--to wit, the part 20, having the front safety-wing, the part 21, having the rear safety-wing, and the heel-rail 22. These parts are all bolted, riveted, or otherwise secured to a base-plate, 23, the part 21, having the rear safety-wing, being bolted to the heel-rail, the latter parts being further held in proper relation to each other at their rear ends by the cross-plate 24, to which the rod 19 is also connected.

The making of the several parts of the frog separable from each other renders it possible to renew or repair one of the parts without disturbing the others. The portion 21 of the frog carrying the rear safety-wing, 14, is made V-shaped, as shown in Figs. 3 and 5, and is provided with an angular recess along its upper and outer edge, said recess forming, in connection with the part 20, a groove, 25, for the passage of wheel-flanges, as clearly shown.

As shown in Figs. 7 and 8, the safety-wings 13 and 14 extend almost entirely across the tread of the main rail when in operative position; but, if desired, said wings may extend only partially across the main rail, the remaining portion of the tread of the main rail being covered by the flange 12 of the movable section of the leading-in rail, as shown in Fig. 6.

In order to obtain a practically uniform and continuous tread for wheels passing from the leading-in rail to the movable section, and from the heel-rail of the frog to the inside rail of the siding, the meeting ends of the stationary and movable portions of the leading-in rail are beveled off, as shown at 26 in several views, as are also the meeting ends of the heel-rail and the inner siding-rail. In addition to the absence of jar incident to the continuity of tread, this beveling off of meeting ends of rails avoids all difficulty of placing the movable frog and leading-in rail into operative position, as is occasionally caused where butt-joints are used by the expansion of the rails.

Alongside of the siding, and extending from the points of the switch-rails to or slightly beyond the location of the frog, is arranged the shaft 27, provided with cranks 28, 29, and 30, connected, respectively, by suitable rods, 31, 32, and 19, to the movable switch-rails, the movable section of the leading-in rail, and to the movable frog, as clearly shown. The cranks 28 and 30 are arranged on the same side of the shaft, the crank 29 projecting from the opposite side thereof as the movable section 7 is moved in an opposite direction from that of the switch rails and frog. As will be noticed, the throw of these cranks is proportioned to the amount of movement required in the several parts, that of the switch-rails being least and that of the frog being greatest, while the movable section 7 is intermediate between the two.

In making a portion of the leading-in rail

movable all wearing away of the flanges of the wheels or the inner edge of the leading-in rail adjacent the frog is entirely avoided.

In the herein-described location and arrangement of the pivot-pins of the movable frog and leading-in-rail section at points where wheels never pass over them they are freed from the jarring to which they would be subjected if located at such points as would bring them close to the path of the wheels and within the influence of the hammer-like blows of such wheels passing in or out of the siding.

I claim herein as my invention—

1. A movable frog-rail constructed to be thrown upon the main rail and provided with inclined extensions adapted to lie alongside the main rail, and to raise the wheels of cars passing along the main rails above the level of such rails, substantially as set forth.

2. A movable frog-rail arranged outside of and constructed to form a bridge across the main rail for wheels of cars moving into a siding, said frog-rail being pivoted at the end nearest the switch-points, substantially as set forth.

3. A movable frog-rail constructed to form a bridge across the main rail for wheels of cars moving into a siding, in combination with a leading-in rail having a movable section, said section being pivoted at its rear end, substantially as set forth.

4. A movable frog-rail having the end of its heel-rail beveled, in combination with the inner siding-rail having its end adjacent to the frog correspondingly beveled, sustantially as set forth.

5. A movable frog-rail constructed to form a bridge across the main rail for the wheels of cars moving into a siding, in combination with a leading-in rail having a movable section provided with a groove for the reception of the flanges of wheels moving along the main rail, substantially as set forth.

6. A movable frog-rail constructed to be thrown upon the main rail and to partially cover the tread thereof, in combination with a leading-in rail provided with a movable section constructed to be thrown upon and partially over the main rail, forming in connection with the movable frog a tread for the wheels moving along the main rail, said movable section being provided with a groove for the flanges of such wheels, substantially as set forth.

7. A movable frog-rail having in combination the part 20, forming the front safety wing and extension, the part 21, forming the rear safety wing and extension, and the heel, said parts being detachable from each other, substantially as set forth.

In testimony whereof I have hereunto set my hand.

CHARLES B. PRICE.

Witnesses:

DARWIN S. WOLCOTT,

R. H. WHITTLESEY.