

(No Model.)

H. L. PYLE.

AUTOMATICALLY ADJUSTABLE LOCOMOTIVE HEAD LIGHT.

No. 356,787.

Patented Feb. 1, 1887.

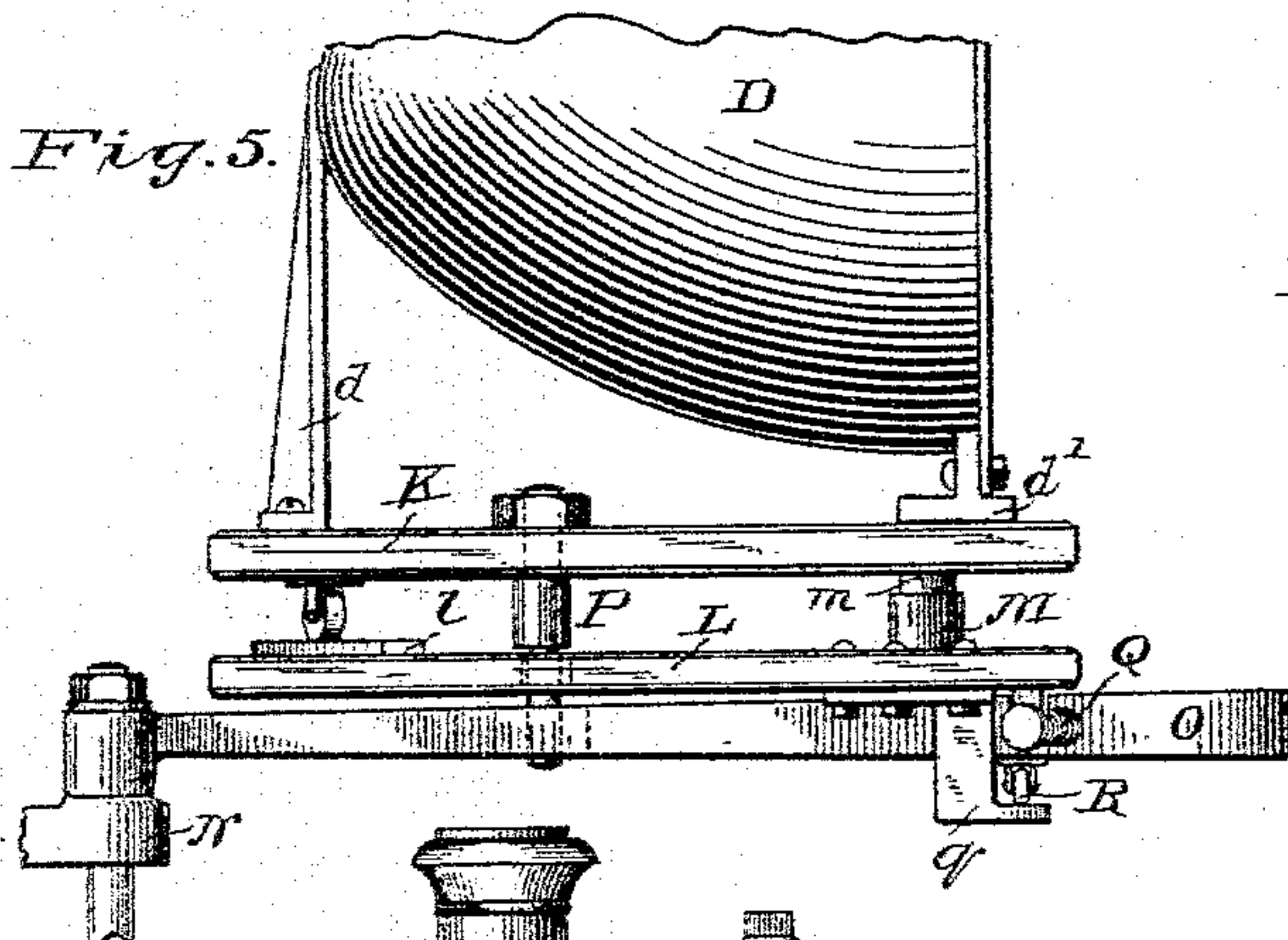
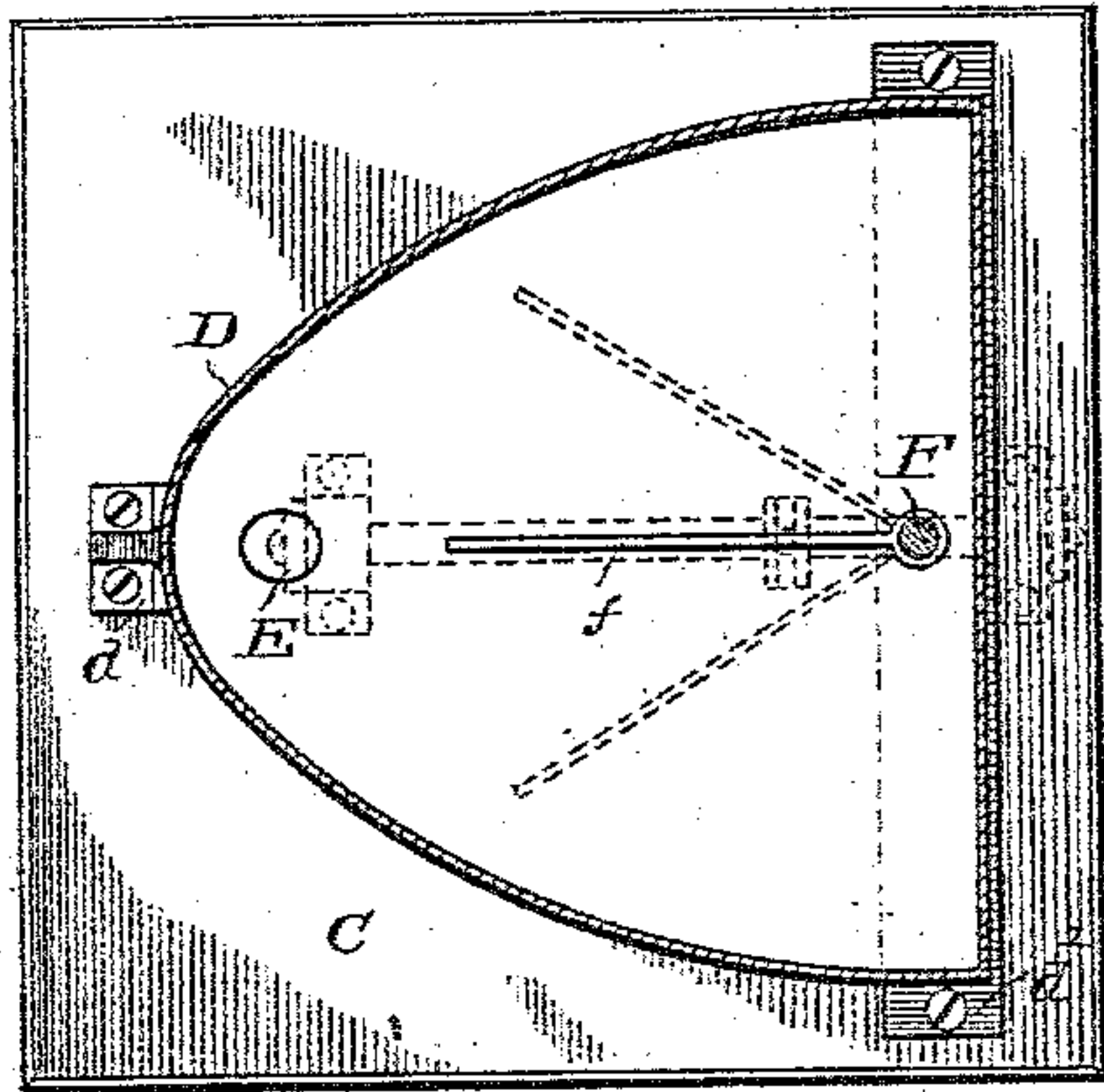
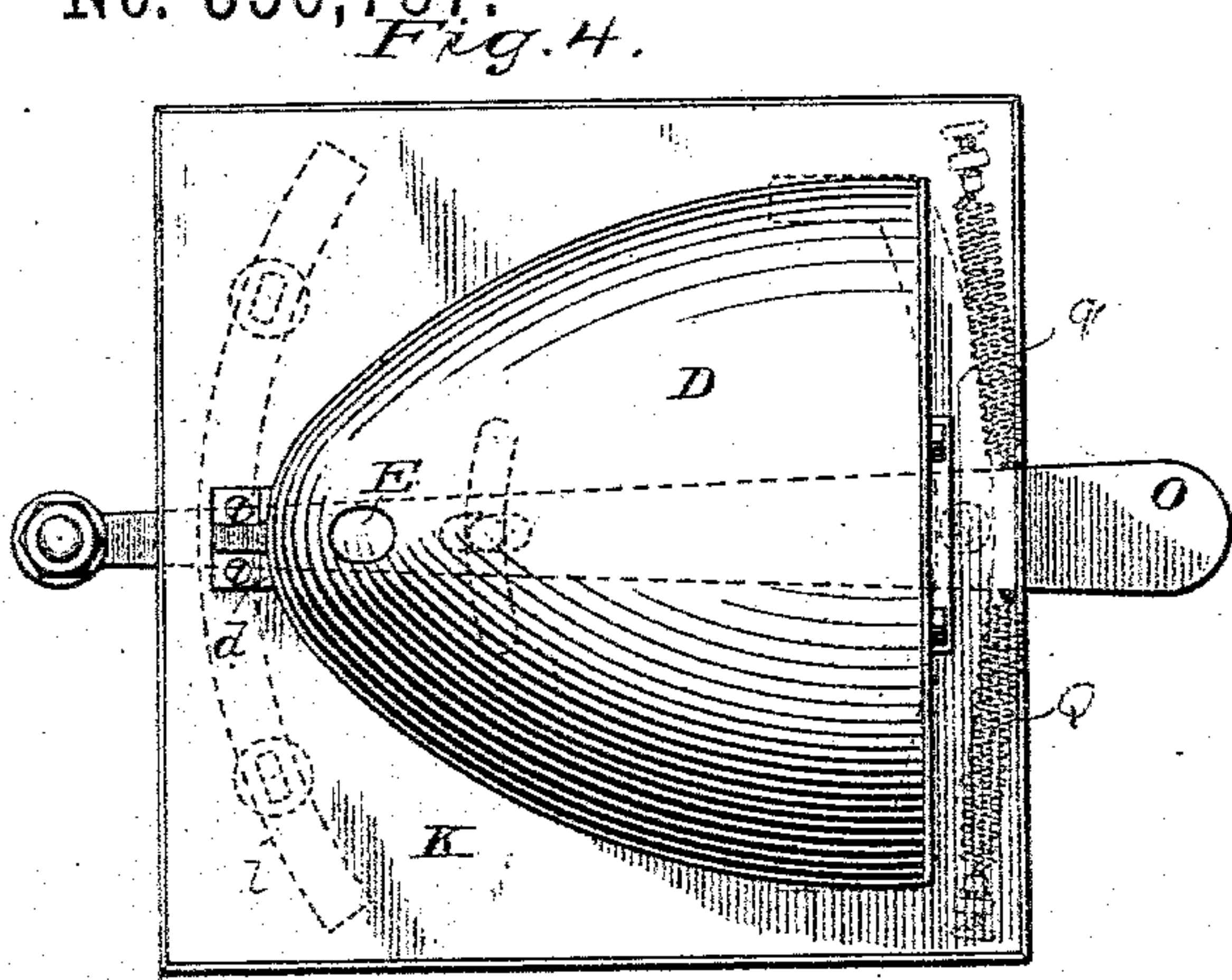
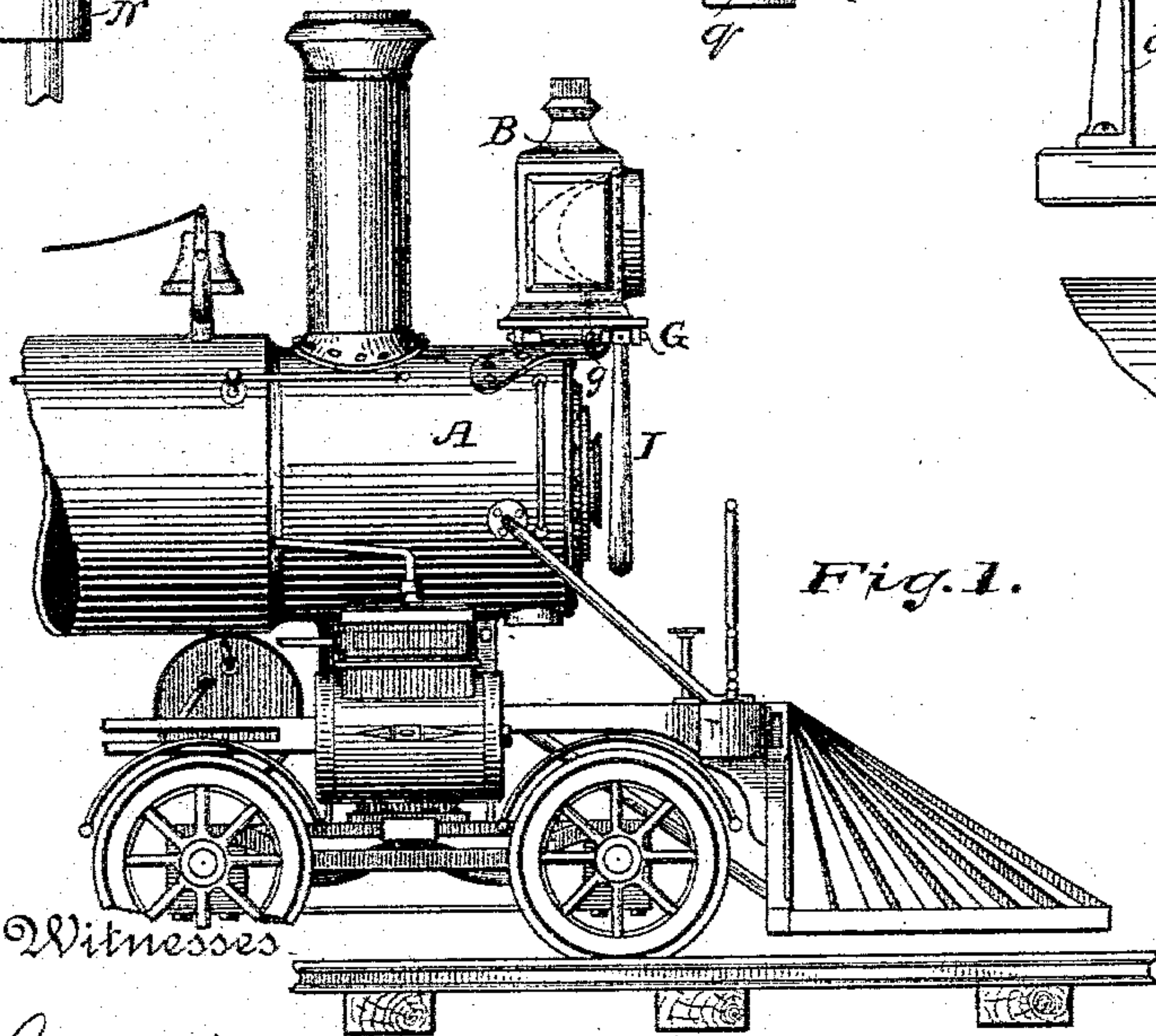
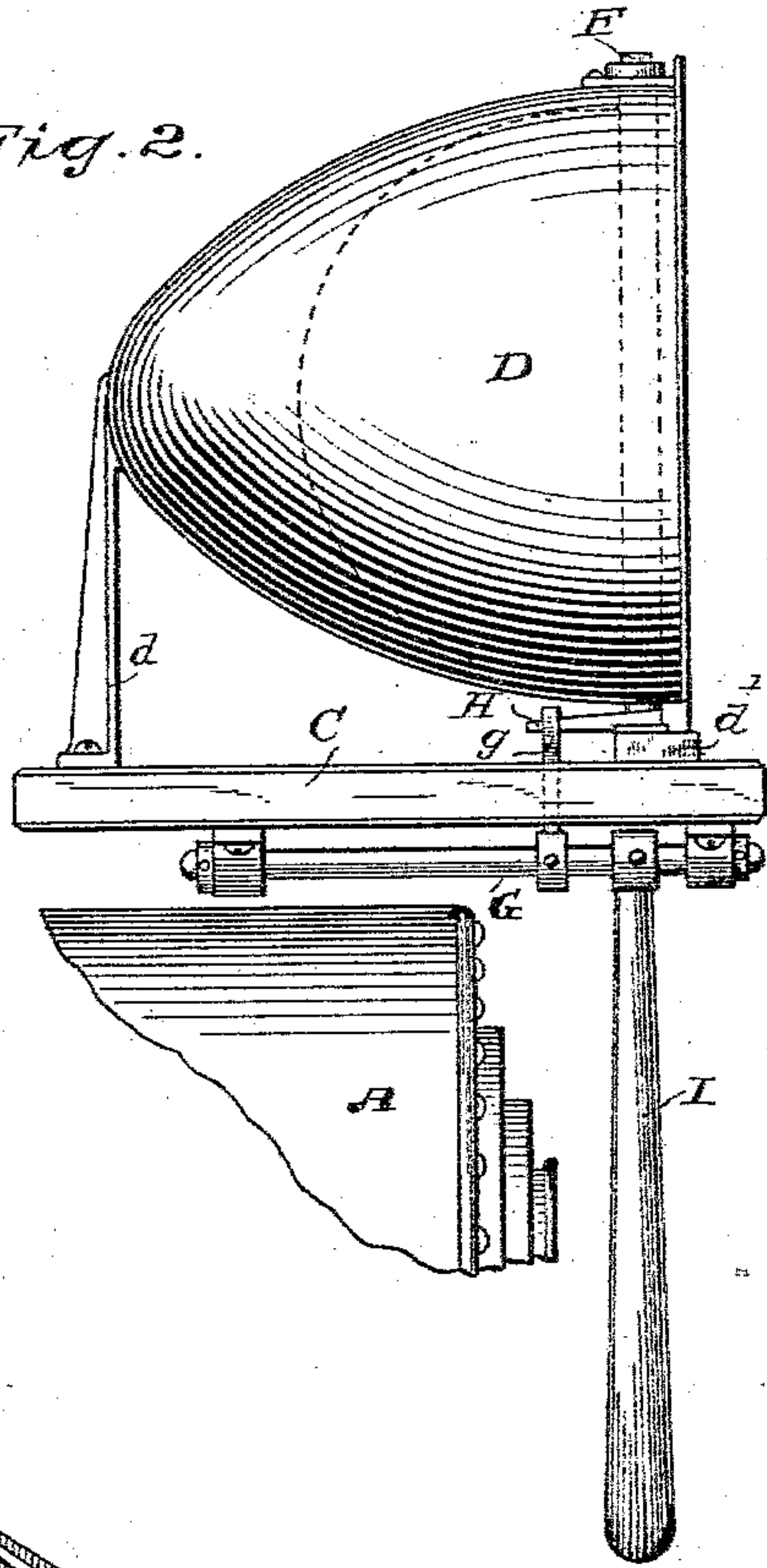


Fig. 2.



Witnesses

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HOWARD L. PYLE, OF AKRON, OHIO.

AUTOMATICALLY-ADJUSTABLE LOCOMOTIVE HEAD-LIGHT.

SPECIFICATION forming part of Letters Patent No. 356,787, dated February 1, 1887.

Application filed March 24, 1886. Serial No. 196,387. (No model.)

To all whom it may concern:

Be it known that I, HOWARD L. PYLE, a citizen of the United States, residing at Akron, in the county of Summit, State of Ohio, have
5 invented certain new and useful Improvements in Automatically-Adjusted Locomotive Head-Lights, of which the following is a description.

My invention relates to improvements in locomotive head-lights; and it consists in so constructing and arranging the entire lamp that the light and its reflector and their supports, or a separate structure placed with each lamp, will be automatically moved and adjusted so as to throw the light across the chord of the
15 circle as the locomotive begins to turn a curve, and in that manner so divert and direct the beam of light that the track will be illuminated in front of the train even on the sharpest curves.

I am aware that it is not new to mount a head-light pivotally upon the front portion of a locomotive, and to provide a rod or bar extending back to within reach of the engineer, so that he might turn the head-light and direct the beam of light issuing therefrom in the
25 desired direction in front of the engine. It has also been proposed to mechanically connect a pivoted head-light with some portion of the front truck of a locomotive, so that as the truck turns under the engine in rounding curves the head-light would be directed in the direction of the curve, and so illuminate the track in front of the train. A serious objection to this latter method consists in the fact
35 that at highest speeds the action will necessarily be spasmodic and violent; and, further, there being so many different patterns of trucks now in use, the application thereto of such an arrangement would require an immense amount of fitting and a great many mechanical complications. I have therefore embodied my invention in a form free from such defects, the mechanical device by which my head-light is
45 track being operated by the swaying of the locomotive as it responds to the increased height of the outer rail on a curve, and consisting in a swinging weight, which may be operated by centrifugal action or take the form of a pendulum. With either form the movement of the parts is directly in proportion to the radius of the curve as exemplified by the height of the outside rail, and therefore auto-

matically adjusts itself to the varying demands resulting from the variations in the radius of the curve and the speed of the train, as will be hereinafter more fully set forth.

In the accompanying drawings, which form a part of this specification, Figure 1 is a view in elevation showing the front portion of a locomotive provided with my improved automatically-adjusted head-light. Fig. 2 is an enlarged view, also in elevation, of the head-light shown in Fig. 1, the exterior casing thereof being removed. Fig. 3 is a central
65 transverse section through the reflector shown in Fig. 2. Fig. 4 is a top plan view of a lamp with exterior casing attached, exhibiting a modification of the arrangement shown in the three preceding figures. Fig. 5 is an elevation of the devices shown in Fig. 4, a portion of the reflector being broken away for convenience.

Similar letters denote like parts throughout.

A represents the front portion of the smoke-box of a locomotive, upon which is mounted in the usual or any well-known manner a head-light, of which B is the fixed outer casing. Within the casing B, and mounted upon a suitable base, C, is a parabolic reflector, D. This reflector is preferably fixed upon its base, and is supported thereon in any suitable manner—as, for instance, by the post *d*, at its rear end, and an angle-plate, *d'*, at its front edge, said front portion being covered and protected from the weather by the usual glass screen, which is carried by the exterior casing, B. A
85 suitable aperture, E, is provided near the rear end of the reflector D, through which the illuminating medium, which may be an electric-arc light or any other desired illuminator, is introduced.

Close to the front edge of the reflector is placed a small vertically-pivoted rod, F, to which is secured a thin, light metallic blade or vane, *f*, which extends from its support F rearwardly to a point near the focus of the reflector, and is rounded at its edges, so that by means of its support it can be swung from side to side within the reflector. The vane is to be either composed entirely of or covered with some metal capable of receiving and retaining a high polish and forming a good reflector.

The base C is a fixture, and to it is secured the longitudinal shaft G, from which extends a crank-arm, *g*, which engages an arm, H, which is secured to and projects laterally from

the vertical rod F. A pendulum, I, is secured to and depends vertically from the shaft G, lying in front of the end of the boiler-extension, in which position it is free to swing to one side 5 as the engine leans over on leaving the straight track and rising onto the high rail placed on the outside of all curves. The swinging of the pendulum I is communicated to the shaft G, oscillating the crank *g*, rotating the rod F, and 10 moving the vane toward that side of the reflector nearest the outside of the curve, the effect of which will be to divert the beam of light ordinarily projected directly in front of the train to one side and in the direction of 15 the curve being traversed.

The ordinary rocking of the locomotive, while in some instances both frequent and severe, is usually as much in one direction as the other, and will not materially affect the 20 described arrangement, as there will not be a sufficient amount of time between the movements from one direction to the other to allow of any important shifting of the vane *f* or pendulum I. Being very thin, and polished on 25 both sides, the vane *f*, when in its central position, will absorb little or no light and not interfere to any material extent with the light thrown forward.

In Figs. 4 and 5 I have shown a modification of the foregoing, in which the base K is 30 pivoted at its forward end and provided with suitable anti-friction rollers to support its rear portion. A fixed base, L, supports the movable one, K, and is provided with a track, *l*, 35 for the rollers, attached to the under side of the movable base, and a suitable socket, M, for the pivot *m*, secured to the under side of the aforesaid movable base K. In a suitable support, N, attached to the boiler-extension or 40 some fixed portion of the casing of the head-light, is a bearing, N, within which is pivoted a weight, O, arranged to swing horizontally therein. To the base K is secured the bolt P, which projects downward through a 45 radial slot in the fixed base L and into a longitudinal slot in the weight O. Tension-springs Q Q are attached at each side of the weight O, near its outer extremity, and are adjustably secured in suitable brackets fixed 50 at the under side of the fixed base L. A frame or track, *g*, depends from the base L and supports the roller R on the under side of the weight O. With this construction the direction of the lamp as a whole is altered and 55 made to correspond with that of the curve upon which the locomotive is running, the centrifugal action of the weight O propelling the reflector in the opposite direction and producing the desired result whenever the direction of the locomotive varies from a direct 60 line. By means of the tension-springs Q the weight is always brought back to a central position, and the vibration and ordinary movements of the locomotive caused by slight irregularities in the track are absorbed and prevented from affecting the direction in which 5 the light issues.

It will be obvious that many modifications and changes may be made in the above-described apparatus without in any way departing 70 from the spirit of the invention—as, for instance, it is immaterial where the pendulum I or weight O are placed, the positions shown are convenient; but they may equally well be placed above, behind, inside, or at the side of 75 the exterior casing of the head-light. So, also, with the movable vane. It may be placed outside and in front of the casing, and may be centrally pivoted, instead of as shown.

Having described my invention, what I 80 claim, and desire to secure by Letters Patent, is—

1. The combination, with a pivoted reflector and source of light, of an arm weighted at one end and pivoted at or near its other and 85 carried by the locomotive, the said reflector being pivoted at or near its front and positively connected with the weighted arm, whereby the light is directed in a direction opposite to the movement of the weighted arm, substantially as set forth. 90

2. The combination, with a fixed reflector and suitable source of light, of a pivoted auxiliary reflector in front of the burner, whereby the beam of light can be directed away from 95 the stationary plane of projection, substantially as shown and described.

3. The combination, with a reflector and a suitable source of light, of an auxiliary reflector pivotally mounted within said reflector, 100 whereby the light can be directed away from the stationary plane of projection, substantially as shown and described.

4. The combination, with the locomotive, of a head-light provided with a suitable parabolic 105 reflector and a source of light, an auxiliary reflector pivoted within the reflector, and an arm weighted at one end and pivoted at or near its other and carried by the locomotive, the pivoted reflector being connected in the rear 110 of its pivot with the weighted arm, whereby said auxiliary reflector will be swayed from one side to the other, in accordance with the swing or lean of the locomotive when moving upon a curve, substantially as shown and de- 115 scribed.

5. The combination, with the moving vehicle, of a parabolic reflector and a suitable source of light, an auxiliary reflector pivoted near the front end of the reflector, the pivots 120 of said auxiliary reflector provided with a laterally-extending arm, a longitudinal shaft, a weight depending from said shaft, a crank-arm extending upward therefrom and engaging the arm of the pivot of the auxiliary reflector, whereby the position of said auxiliary 125 reflector is caused to respond to that of the swinging weight, substantially as set forth.

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

HOWARD L. PYLE.

Witnesses:

GEO. W. YOUNG,
HENRY A. LAMB.