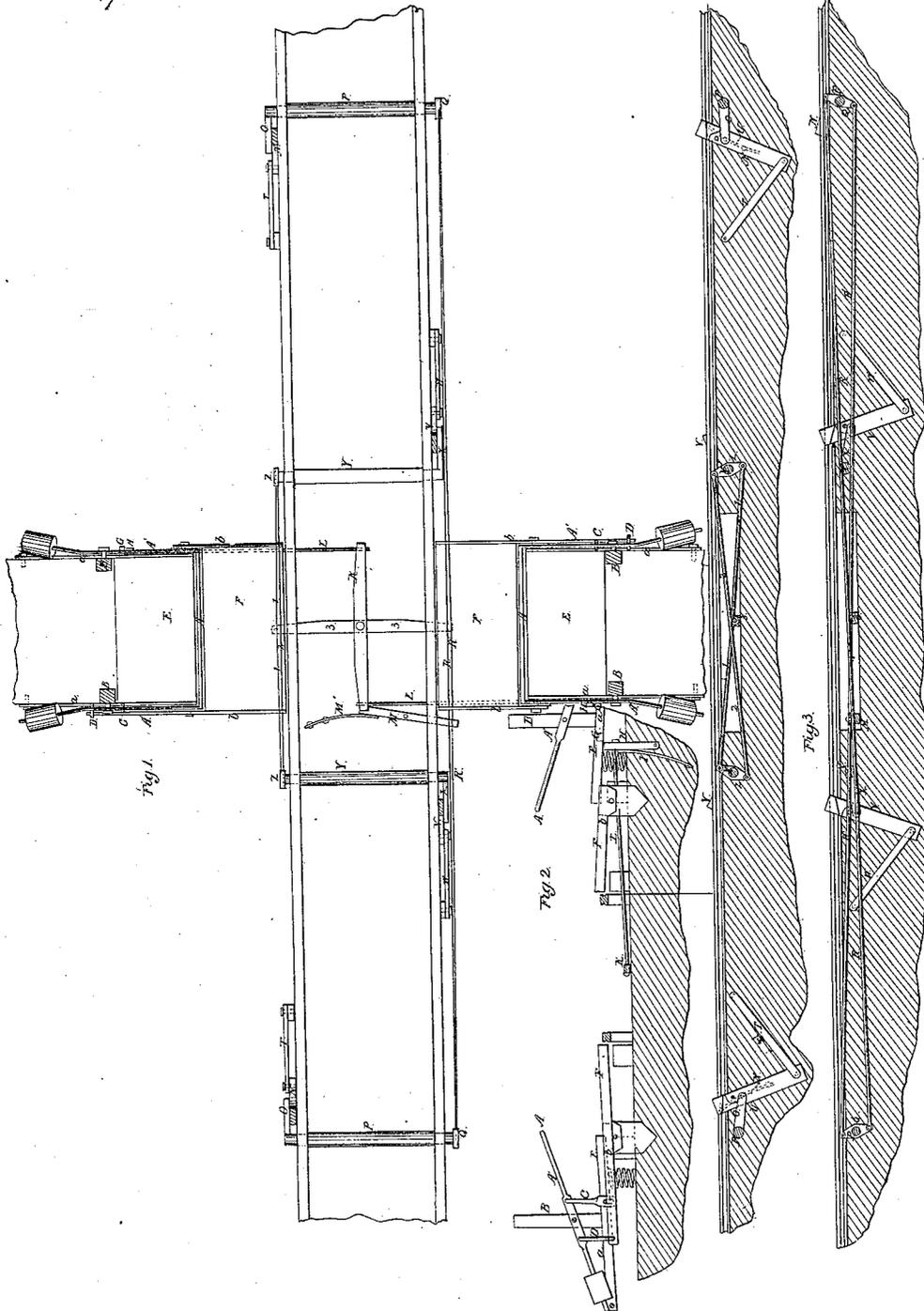


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*N<sup>o</sup> 13,956.*

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# UNITED STATES PATENT OFFICE.

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## AUTOMATIC GATE FOR RAILROAD-CROSSINGS.

Specification of Letters Patent No. 13,956, dated December 18, 1855.

To all whom it may concern:

Be it known that I, GEORGE B. PULLINGER, of the city and county of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in Automatic Gates or Barrier - Bars at Railroad - Crossings; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making part of this specification.

Figure 1, is a top or bird's-eye view of a section of rail road track and crossing with the safety apparatus applied thereto. Fig. 2, is a side elevation of the rail road track and inclined bars for detaching the notched lever upon the approach of the locomotive and cars to prevent the descent of the gates or barrier bars by the gravity of vehicles or other objects on the flaps outside the same. Fig. 3, is a side elevation of the opposite side of the rail road track and similar inclined bars, for attaching the notched lever, after the locomotive or head of the train of cars has passed the crossing to enable the gates or barrier bars to descend by the weight of vehicles or other objects on the flaps. Fig. 4, is a transverse section of the rail road near the point where a common road or crossing intersects the same, showing the automatic gates or barrier bars, and parts for operating the same, as well as the parts for preventing the descent of the outside flaps and consequently the descent of the gates or barrier bars.

Where the same letters occur in the several figures they indicate corresponding parts.

The nature of this invention and improvements consists in providing rail roads and common roads where they intersect or cross each other and at proper distances from the point of intersection such a combination and arrangement of mechanism as to cause a locomotive or train of cars, or a single car to operate on the portion of the mechanism situated at the crossing and at such a distance from said crossing as to prevent automatic gates or barrier bars, descending to allow the passage of vehicles or other objects on the rail road track, until after the said locomotives or cars have passed the crossing, when said vehicles or other objects will be enabled to depress said gates or barrier bars, by their own gravity, as they will at all times when approaching locomotives and cars are not sufficiently near the cross-

ing to create danger, or after the vehicles or other objects have passed over the gates onto the track and allow the said gates or barrier bars to be raised behind them to prevent another vehicle or other object following in the event of the near approach of the locomotive or cars and thus avoid all liability of accident to the locomotive and cars and vehicles or other objects crossing the rail road track.

To enable others skilled in the art to make and use my invention I will proceed to describe its construction and operation.

The automatic gates or barrier bars A, consist of bars or rods extending the full width of the crossing one on either side of the rail road track, and near to and parallel with the same, bent at right angles at the sides of the crossing so as to form side bars A', extending at right angles from the track and suspended at their centers by bolts, upon which they move to upright posts B, fixed permanently in the sides of the crossing, said side bars having weights attached at their ends sufficient to overcome the weight of the cross gates or barrier bars and other parts hereafter mentioned, so as to always keep them raised when not operated upon by vehicles or other objects.

One of the side bars of each of the gates or barrier bars is provided with upright connecting rods C, D, jointed to it near the bolt on which it is suspended, the connecting rod C on the inside of the bolt having a slot at its lower end where it is attached to an inclined bar secured to the end of a rising and falling flap E, extending the full width of the passage way of the crossing by a bolt passing through said slot into the end of the flap bar, said flap having a corresponding bar secured to its opposite end, and both of said bars extending some distance beyond the upright posts B, and being attached by bolts upon which they move to suitable uprights fixed in the ground. The other connecting rods D, outside the bolt on which the side bar or piece moves, are jointed to the ends of bars similar to the bars of the flaps E and arranged outside the same being secured at their opposite ends to other flaps F, similar to the said flaps E and arranged between them and the rail road track, and having other bars on their opposite ends, which like the first mentioned bars are secured by bolts upon which they move to permanent posts in the ground so as to enable the flaps F, to have an up and down move-

ment similar to the flaps E but entirely independent of it, the slots in the inside connecting rods C, allowing the bolts passing through them to rise freely without effecting the flaps E, when the flaps F are depressed and with them the gates or barrier bars, and yet enabling the said gates or barrier bars to be depressed when the said flaps E are pressed upon and depressed from any cause.

On the opposite ends of the flaps E to those where the slotted connecting rods C, are attached are secured projections or studs G, immediately under which are arranged upright bars H jointed by bolts to a permanent structure and having the upper flexible ends or springs T secured at their lower ends to the structure just mentioned and pressing against their inner edges near their upper ends in such a manner as to force the upper ends of said jointed upright bars H under the projections or studs G when not otherwise held (as hereinafter stated), and prevent the depression of the said flaps E and consequently of the gate or barrier bars by the weight of a vehicle or other object on said flaps E. These upright bars H are prevented from being forced under the projections or studs G except when the locomotive is nearly approaching the crossing by means of a vibrating lever K moving on a bolt at its center midway between the rails of the track and at the center line of the crossing, and attached respectively by rods L near its ends to the centers of the upright bars H in such a manner as to enable said lever K when vibrated on its center bolt to draw the upper ends of both uprights from under the projections or studs G of both flaps E, to allow their descent, when a locomotive or cars are not sufficiently near the crossing to endanger vehicles crossing the track as before stated, the said vibrating lever K being held firmly after it has drawn the uprights H from under the projections or studs by a lever M turning on a stud at its center and arranged in front of one end of the lever H and having a notch on its end against the upright edge of which the end of the lever K is attached or caused to press when the upper ends of the upright bars H are drawn toward the track by the action of the locomotive or cars after they have passed the crossing. The notched end of the lever M is pressed against the end of the vibrating lever K by a spring M', and is detached from the same to allow the springs I to force the upright bars H under the projections or studs G and thus prevent a vehicle or other object depressing the outer flaps and the gates or barrier bars when they press upon the former, by means of inclined bars N N, projecting above the track at distances from the crossing of say 300 yards so as to enable the tread or rim of the wheels of the locomotive or cars approaching the crossing to pass over and depress them, by pressing against their raised ends and also depress radial arms O, O, to which they are jointed near their upper ends secured to transverse rock shafts P, below the tread of the rails of the track, on one of the ends of which each of which rock shafts P are secured other double radial arms Q having rods R R, attached at their ends, one of these rods (R) being attached to the upper end of one of the double radial arms Q and extending and attached to the lower end of the other double radial arm Q', and the other, R being attached to the lower end of the radial arm Q and extended and attached to the upper end of the other radial arm Q', crossing the rod R in its course and being attached to the end of the lever M, so as to detach its notched end from contact with the end of the vibrating lever K and make the respective movement of the inclined bars N N double radial arms Q, Q', and lever M correspond and enable the depression of either of the inclined bars N N to remove the notched end of the lever M from contact with the end of the vibrating lever K. After the notched end of the lever M is in this manner detached from the end of the vibrating lever K the upper ends of the upright bars H are pressed under the projections or studs J by the springs I as stated, the flaps E being held in an elevated position by spiral springs S arranged under them to allow this result. The lower ends of the inclined bars N N, are jointed to the ends of inclined rods T, T, jointed at their opposite ends to the side of the rail of the track, for the purpose of guiding them with the assistance of the radial arms O, O, in their up and down movements the upward movement of said inclined bars being effected by the action of the spring M' acting upon the notched lever M so as to bring their upper ends the proper distance above the track.

The treads or rims of the locomotives and cars are allowed to pass over the upper ends of the inclined bars N, N, by jointing them a short distance below their upper ends somewhat after the manner of a rule joint as represented in figure, and having springs U, secured to their sides, which springs press at their flexible ends against pins projecting from the sides of their upper parts in such a manner as to keep their upper ends above the track, so that they may assume an angle of about forty five degrees for the tread or rim of the wheel of the locomotive or cars to press against to force the bars down as before stated when approaching a street or crossing but to allow said upper ends to yield and

descend with the springs U level with the line of the track without affecting the position of the lower parts of said inclined bars N, N, when the locomotive and cars pass over them after passing the crossing.

After the locomotive and cars have passed the crossing the tread or rim of their wheels operate on and depress other inclined bars V, situated a sufficient distance from the crossing to allow the longest train of cars to pass by the crossing before its front end reaches the same, and suspended on jointed bars W attached to the rail of the track and to radial arms X on the ends of rock shafts Y having double radial arms Z on their opposite ends, the said inclined bars V being jointed after the manner of a rule near their upper ends and provided with springs similar to the springs U, and arranged and operated upon by the locomotive and cars so as to give a vibratory movement to the double radial arms Z in every respect similar to the inclined jointed bars N, N, except that they arranged outside the opposite rail and incline in reverse directions, the upper inclined ends of the inclined bars V being toward the crossing, while the corresponding ends of the inclined bars N, N, incline from the crossing in such a manner as to cause the locomotive and cars to depress the bars N, N, in their approach to the crossing and simply depress their upper jointed parts in passing over them after passing the crossing, and to depress the entire inclined bars V after they have passed the crossing and simply depress their upper jointed parts in their approach to the same.

The double radial arms Z are attached to each other by rods, 1, 2, extending from the upper end of one to the lower end of the other and crossing each other in the same manner as the rods R, R', do, one of the rods (1) being jointed to the end of a lever 3 secured at its center to the center of the vibrating lever K and arranged at right angles to and moving with the same in such a manner as to enable the locomotive and cars when they depress either of the inclined bars V after passing the crossing to move the lever 3, through the agency of the radial arms X rock shafts Y double radial arms Z and rods 1, 2, and with it the vibrating lever K so as to draw the upper ends of the upright bars H from under the projections or studs G on the ends of the flaps E and bring the end of the vibrating lever K in the proper relation to the notch on the end of the lever M. to cause it to engage with or hold the same, and enable the flaps E to be depressed by the weight of vehicles or other objects approaching to cross the track and with them the gates or barrier bars A.

It will be observed from the foregoing that the locomotive and cars passing by a crossing do not act upon the gates or bar-

rier bars A in any other manner than to allow the upper ends of the upright bars H to be forced under the projections or studs G on the ends of the flaps E, by the springs I to prevent the depression of the flaps E and consequently of the gates or barrier bars A but yet allow the vehicle or other object to depress the inner flaps F to lower the gates or barrier bars to allow the vehicle or other object to pass out from between the same in case they should have passed over the outer flaps E and be situated between the two outer flaps E when the locomotives or cars reach either of the inclined bars N N, in their approach to the crossing, and on the other hand that the vehicles and other objects can pass over the flaps E, and railroad from either side without producing any other effect than depressing the said flaps and gates or barrier bars to be again brought to their raised positions by the weights on the ends of the side bars or pieces and the spiral springs under the flaps E, except in the event of a locomotive or cars being sufficiently near to detach the notched lever from the vibrating lever the nearest point likely to place such vehicle or other object in jeopardy.

What I claim as my invention and desire to secure by Letters Patent is—

The combination of the mechanism attached to the rail road track and operated upon by the locomotive or cars for detaching from and bringing in contact the notched end of the lever M, with the end of the vibrating lever K, with the upright spring bars H, studs or projections G, on the ends of the flaps E, and the means of operating the flaps E, F, and gates or barrier bars, so as to enable the said gates or barrier bars, to be depressed by the weight of the horse or other object when no danger is to be apprehended, from the near approach of the locomotive or cars, but prevent the said gates or barrier bars being depressed to allow the passage on to the track of any object after the locomotive or cars have reached a point on the track sufficiently near the crossing to render the passage of such object unsafe, and yet allow the said object to depress the gates or barrier bars through the agency of the inner flaps F, to get out from between the same in case the locomotive or cars should have reached the point where it operates on the inclined bars N, to prevent the depression of the outer flaps E, and consequently of the gates or barrier bars through this agency until after the passage by the crossing of the said locomotive and cars, in the manner and for the purpose before described.

GEORGE B. PULLINGER.

Witnesses:

CHARLES D. FREEMAN,  
JOS. R. HARBESON.