(No Model.) 3 Sheets—Sheet 1.

F. W. WITTKOWSKI.

AUTOMATIC RAILWAY SWITCH.

No. 524,187. Patented Aug. 7, 1894.

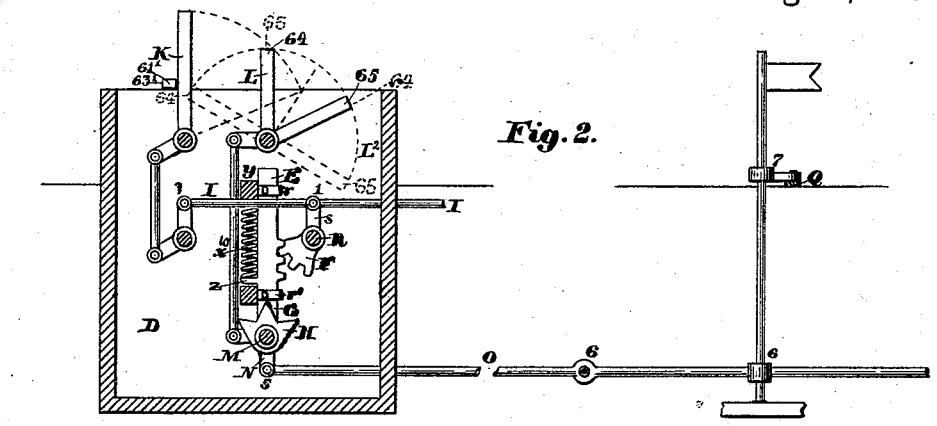

Fig. 2.

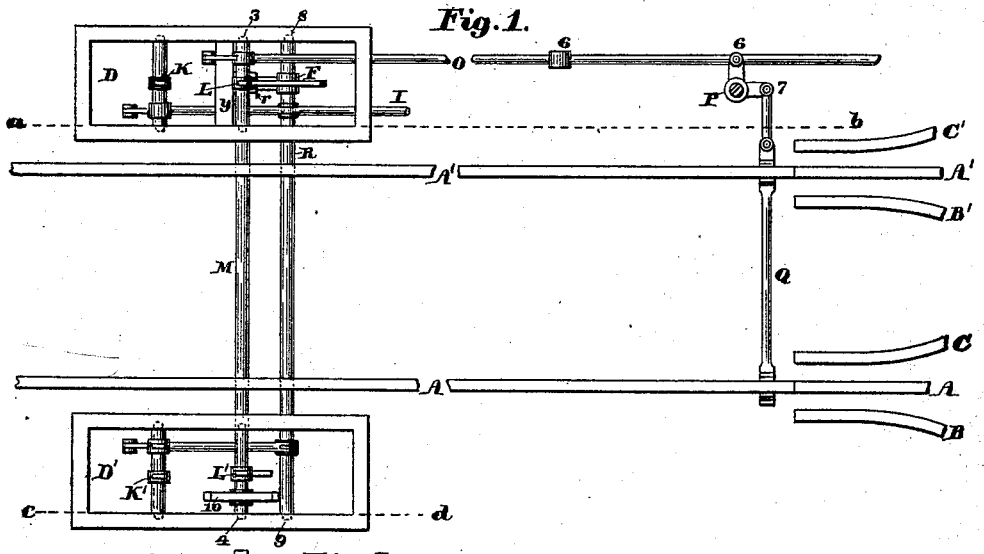

Fig. 1.

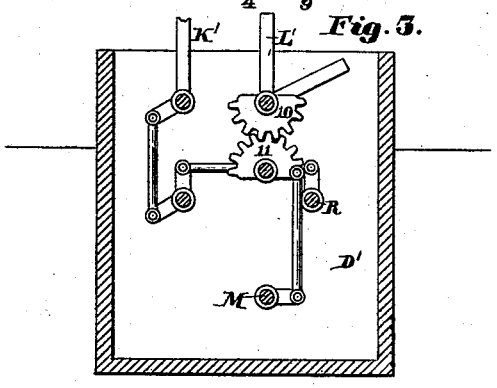

Fig. 3.

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(No Model.) 3 Sheets—Sheet 2.

F. W. WITTKOWSKI.

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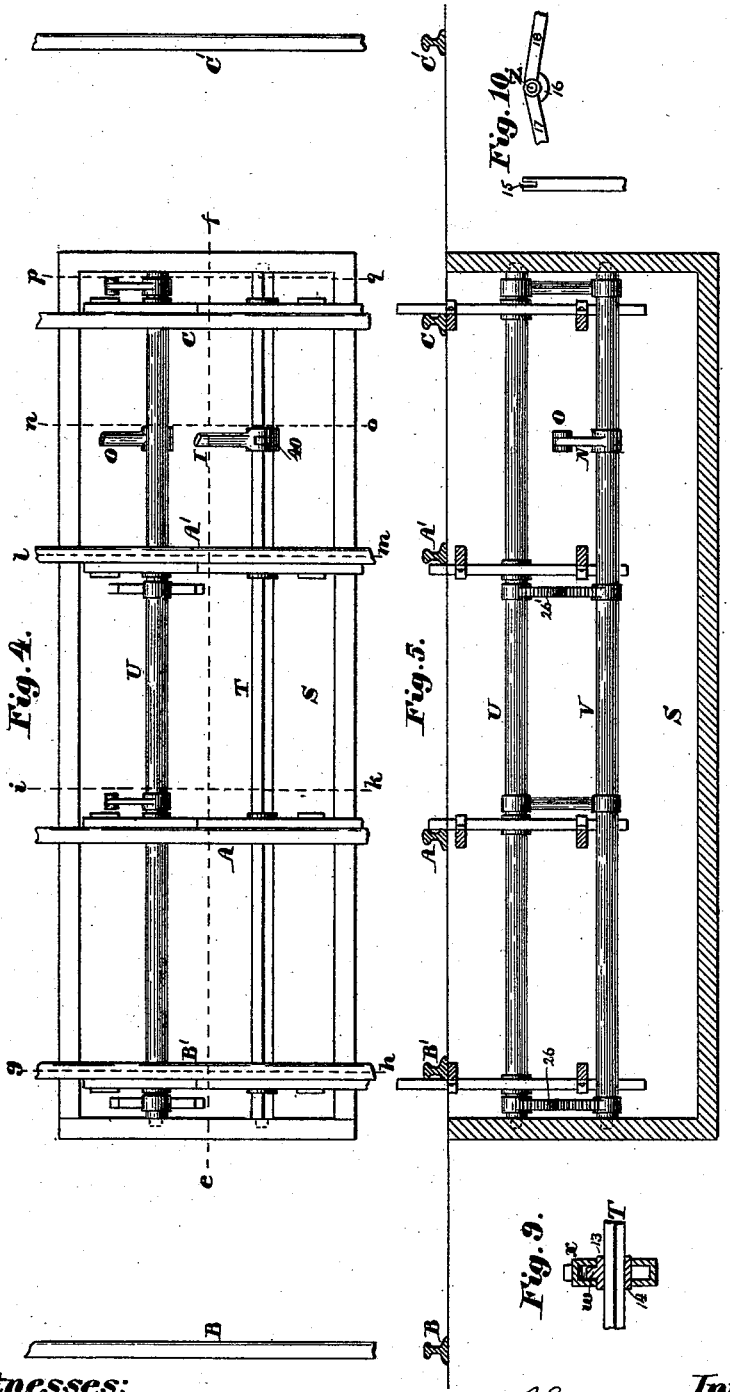

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(No Model.) 3 Sheets—Sheet 3.

F. W. WITTKOWSKI.

AUTOMATIC RAILWAY SWITCH.

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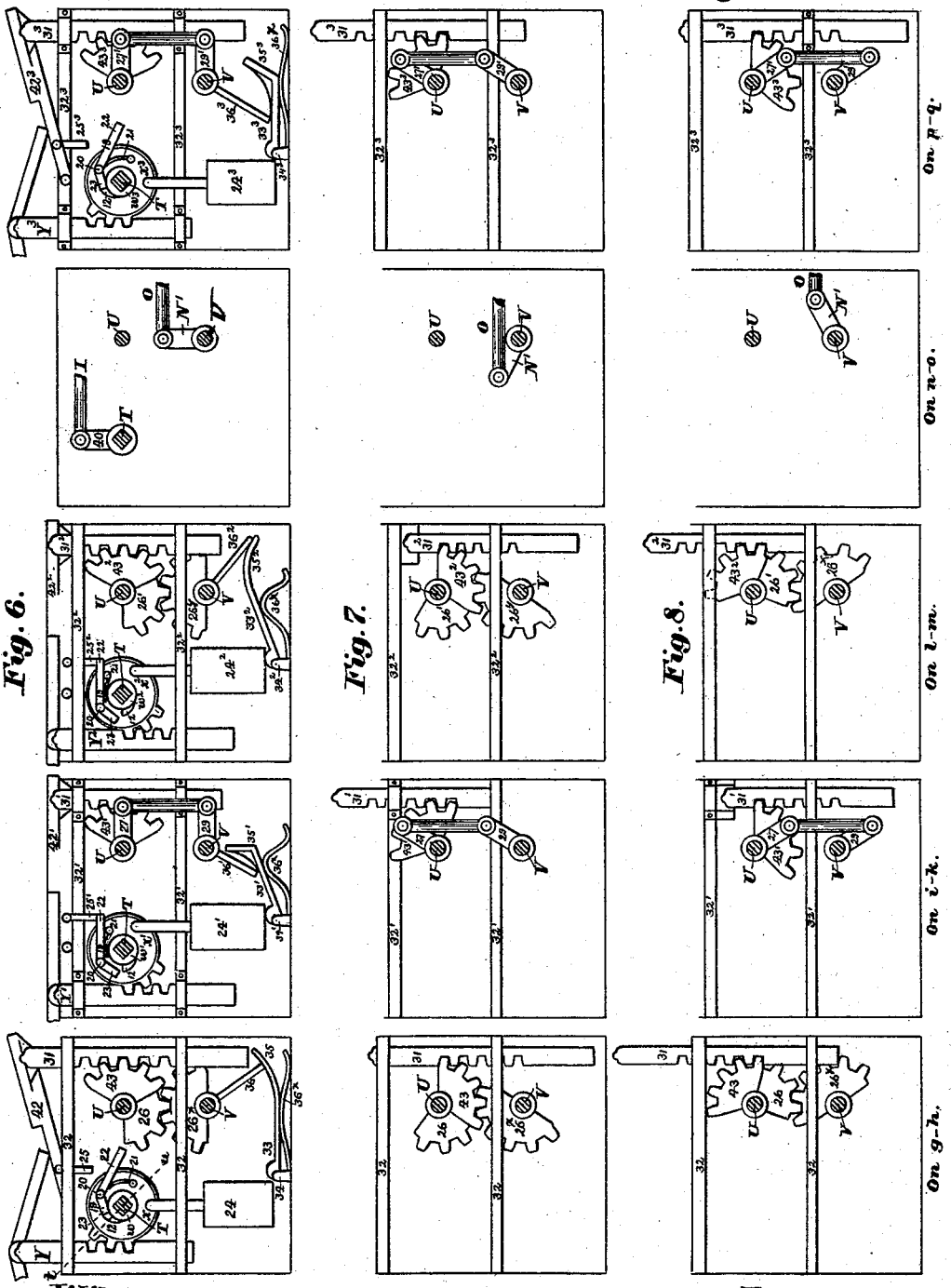

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Inventor:
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UNITED STATES PATENT OFFICE.

FRIEDRICH WILHELM WITTKOWSKI, OF OMAHA, NEBRASKA.

AUTOMATIC RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 524,187, dated August 7, 1894.

Application filed September 7, 1891. Serial No. 405,061. (No model.)

To all whom it may concern:

Be it known that I, FRIEDRICH WILHELM WITTKOWSKI, a subject of the Emperor of Germany, residing at Omaha, county of Douglas, and State of Nebraska, have invented a new and useful Automatic Railway-Switch, of which the following is a specification.

The idea of my invention is that I by help of my mechanism am able to operate a three-thrown switch from the engine or cars and I obtain this my object by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a top view of the mechanism on the main track before the switches are reached. Fig. 2 is a vertical section on the line *a—b* in Fig. 1. Fig. 3 is a vertical section on the line *c—d* in Fig. 1. Fig. 4 is a top view of the mechanism located on the side of the switch opposite to that on which the mechanism shown in Figs. 1 to 3 is located. Fig. 5 is a vertical section of Fig. 4 on the line *e—f*. Fig. 6 is a series of vertical sections of Fig. 4 on the lines *g—h*, *i—k*, *l—m*, *n—o* and *p—q*. Fig. 7 is a series of vertical sections of Fig. 5 on the lines *g—h* to *p—q*, the side track B, B′ being open. Fig. 8 is a similar series of sections of Fig. 5, the side track C, C′ being open. Fig. 9 is a cross section of the hollow wheel *x* with stop wheel *w* on the line *t—u* Fig. 5. Fig. 10 is a cross section of the top part of the rack.

Similar letters and figures refer to similar parts throughout the several views.

On Fig. 1, on each side of the main-rails A A′ are placed the two wooden boxes D D′ to cover and to hold in position the necessary machinery. This mechanism consists of two main-parts, of which the one operates, what I will call the lock, the other operates the track-mover Q. The lock shown in vertical section in Fig. 2 consists of a solid piece of iron or steel E, which is kept in vertical position by help of the two straps *r*, *r′* in which it can move easily up and down.

E is at its one side provided with teeth which engage a toothed sector F and its lower end G is notched so as to engage one of the three uniform teeth of toothed sector H. The crank on shaft R is at 1 connected with the rod I, which at its other end 2 is connected with the operating-lever K, as shown in Fig. 2 in such a way that when K is moved to the right the sector F will also swing to the left and lift E out of its connection with the toothed-sector H.

The operating-lever L is as shown on Fig. 2 connected with the toothed-sector H in such a way that when L is moved to the right the toothed-sector H also moves to the right and when L is moved to the left, the toothed-sector H also moves to the left. The toothed-sector H is fastened to the shaft M, which connects the two boxes D and D′ with each other and can turn in its two bearings 3 and 4—the one in box D the other one in box D′. The toothed sector H has opposite its three teeth a crank N, fastened on the shaft M which at 5 is connected with the rod O. The rod O is at its other end at 6 connected with the one arm of the lever P, of which the other arm at 7 is connected with the track-mover Q. The arm 6 under and the arm 7 above the ground. Besides, as mentioned above, the shaft M connecting the two boxes D and D′ the shaft R also connects the two boxes and can turn in its two bearings 8 and 9.

In box D′ the shaft M is connected with the operating-lever L′, Fig. 3 (corresponding with the operating-lever L Fig. 2) in such a way that by help of the gear-wheels 10 and 11, as shown in Fig. 3, it turns to the left when the operating-lever L′ is moved to the right, or in other words, when the operating lever L′ in box D′ is moved to the right the track-mover Q will be moved to the right side and place the main-track A A′ for the side-track B B′.

On the right side of the switch and at any suitable distance from this, for instance one hundred feet, is placed under the three-thrown track, the box S (Figs. 4 and 5) to cover and to hold in its position the mechanism for the purpose. This mechanism consists, like that described on the main-track side, of the two main parts, viz: first, the necessary machinery for operating the lock and, second, the necessary machinery for operating the track-mover Q as desired.

As shown on the drawings the box S extends under the four rails B′, A, A′ and C so that there is room enough to arrange the machinery which has to be operated from these four rails for the purpose of always having

the main track on the left side of the switch open for that one of the three tracks, (the main track A A′, the side-track C C′ or the side-track B B′) on which the train is coming. In the box S the three shafts T, U, and V, are arranged on their respective bearings. On the shaft T are fastened the four stop-wheels w, w', w^2, w^3. These stop-wheels have the stopper 12 provided with the round bearings or shoulders, 13 and 14. Around these shoulders the hollow wheels x x' x^2 x^3 can move independently of the movement of the shaft T. The wheel x is provided with the necessary cogs, here three, which, by making the necessary part of one rotation, here one-sixth, up or down, will raise or lower the racks Y, Y′, Y^2, Y^3. These racks have on the top a slot 15 (Fig. 10) in which fits the under part 16 of a heavy hinge Z. The one blade 17 of this hinge Z is fastened to the side of the rail, but the other blade 18 is loose so that the hinge will not interfere with the rack in its perpendicular movements, although it by help of the slot 15 and the shape of its under part 16, has to follow the movement of the rack. In the hollow wheel is further arranged the angle lever 19 so that it can move on the pivot 20. The spring 21 will press against the one end 22 of the angle lever 19 and keep the other end 23 against the stopper 12 of the stopwheel w.

To the blade 42 is fastened a free hanging piece of iron 25 of such a length that when the rack is forced downward it follows this and then strikes the arm 22 of the angle lever 19 and lifts the other end 23 of the same off of the stop wheel w, so that then again the hollow wheel x can move on the shoulders of the stop-wheel w. To the hollow wheel x is further fastened the weight 24, which will force the hollow wheel x when it is not stopped to raise the rack by the angle arm 19 in Fig. 6, sections i—k and l—m.

On the shaft U are fastened the four wheel-parts, 43, 43′, 43^2, 43^3 in the positions shown respectively in the different sections of Fig. 6. Further are fastened to the shaft U the two half wheels 26, Fig. 6—section g—h and 26′ Fig. 6 section l—m, as well as the two cranks 27, section i—k, and 27′, section p—q.

To the shaft V are fastened the half wheels 26^x, 26^y respectively, sections g—h and l—m, and the cranks 29 and 29′ respectively, sections i—k and p—q, and finally the main crank N section n—o; and this crank is by the rod O connected with the arm N of the wheel part H in Fig. 2. The two shafts U and V are placed at such a distance from each other that the wheel-parts and cranks fastened to them can work together as shown on the drawings.

The wheels 43, 43′, 43^2, 43^3 fastened to the shaft U match the racks 31, 31′, 31^2, 31^3, which can only move up and down in their respective straps fastened to the cross-timbers 32, 32′, 32^2, 32^3, in the box S—the top parts of these racks are built similar to those of racks Y, &c., for the lock mentioned before, only the hinge Z′ is single.

The connection, between the lock mechanism carried by the shaft T and the switch mechanism carried by the shafts U and V is represented on Fig. 6 in the different sections and is arranged as follows: To the bottom of the box are the levers 33, 33′, 33^2, 33^3 fastened at one end in such a way that they can turn on their respective axes 34, &c. Under the free end of the levers 35, &c., are the steel springs 36, &c., arranged and shaped so that they always will try to force the free end of the levers upward.

To the shaft V the levers 36^x, &c., are fastened and that in such a way that, as shown in sections i—k and l—m, they allow the springs to force the free end of the levers upward, and so bring the pivoted end of the lever (which has the shape of an eccentric) to support the weights 24′ and 24^2, when they are at their highest as shown in sections i—k and l—m. In sections g—h and p—q is shown how the levers 36 press the long end of the levers 35 down and allow the weights 24, &c., to drop and so force their respective racks upward.

To the shaft T is fastened the crank 40, section n—o, which is by the rod I connected with the lock Fig. 2.

As shown on Fig. 2 the spring x^{10} is placed between the timber y and the lug z on the rack E for the purpose of keeping the rack E down.

After having thus described the different mechanisms I will explain how these different parts work together.

On Fig. 1 the main-track is shown to be open—but if I now want to run in on the left side-track C C′ then I run down the operative lever K which will raise the lock-pole E. After the operative-lever K has been run down, by a bar or projection on the car or locomotive or both striking its side and pushing it over, the operative-lever L will also be run down and move the wheel-part H one tooth to the right and just do this movement in right time to be caught by the notch in the bottom part of the lock-pole E and be kept in this its position. At the same time the tooth of the wheel-part H has been moved to the right; the arm N opposite the teeth is moved to the left, pulls the rod O, and through the angle lever P moves the track-mover Q from A A′ to C C′. If I want to run in to the right-side track B B′ then I run down the operative lever K′, which will open the lock; after that, I run down the operative lever L′ and the track-mover Q will move to the right and the track B B′ will be open. If I am coming from the switch side then the main track is shown open on the drawings. But if I now am coming on the track B B′ then I will run down the rack Y, which will open the lock and

thereafter I will run down the rack 42—which will through the shaft V and the crank N′ operate the rod O and open the track B B′.

In Fig. 2 it will be seen that the lever L is composed of the two arms 64 and 65, which make an angle with each other (to correspond with the part of one revolution of the wheel *x*, Fig. 6) here. sixty degrees or one-sixth of the periphery; so that L, when its arm 64 has been "run-down" will come in the position L^2 and the same time have moved the left tooth of the wheel-part H to the place of the middle tooth of the same wheel-part, as the points of these teeth are one sixth of the periphery apart, and the rod O (see Fig. 1) has, through the lever P, moved the track-mover Q, so that the main-track A A′ is for the side-track C C′ (Fig. 1).

The lever L′ (Fig. 3) is constructed similar to the lever L (Fig. 2) and will, when "run-down" move the track-mover Q, so that the main-track A A′ is for the side-track B B′ (Fig. 1). According to above explanation it will be understood that the engineer has it in his power, either to "run down" the lever L, which opens him the side track C C′ or to "run down" the lever L′, which opens to him the side-track B B′. It will also be seen that when L is "run down" or moved one-sixth to the right, L′ will be moved one-sixth to the left and when L′ is "run down" or moved one-sixth to the right, L will be moved one sixth to the left and its arm 65 will come in perpendicular position in the place of the arm 64. Consequently when the arm 65 of the lever L is perpendicular so is the main-track A A′ for the side-track B B′. When now another train comes along on the main-track A A′ and wants to run in on the side-track C C′ then it will be seen that the track-mover Q has to move the main-track twice as far as before (from B B′ to C C′) or in other words the lever L has to move two times one-sixth of the periphery or one-third of the same, and this is obtained as follows: The engineer "runs down" the lever L one-sixth of the periphery so that the arm 64 gets perpendicular and the main-track is for the main-track. But now the brakeman operates, on the first car, also a bar 61′, which then will "run down" the lever L another one-sixth of the periphery so that the arm 64 takes the place of 65 in Fig. 2. The same way as the lever L here has been operated for moving the main-track A A′ from B B′ to C C′ has the lever L′ to be operated for moving the main-track A A′ from C C′ to B B′.

In Fig. 2 it will be seen that the lever K is longer than the lever L and this is for the purpose of keeping E up so long that the point of the respective tooth of the wheel-part H can come inside the reach of the groove G in the lower end of E, and through the track-mover Q keep the respective tracks solid in their places.

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

1. In an automatic switch, locking mechanism provided with an unlocking bar or lever, in combination with track shifting mechanism also provided with an operating bar or lever, said locking mechanism comprising a toothed locking bar and sector, a divergently toothed wheel H, and crank connections whereby the switch is thrown automatically after the locking bar is raised, substantially as described.

2. In a locking device for automatic switches, the combination with a pair of track levers adapted to contact successively with a moving train, of a vertically movable toothed locking bar provided with a retracting spring, a sector meshing with said bar, a divergently toothed wheel H cooperating with the locking bar, and crank and rod connections for automatically moving the wheel H the distance of one tooth, at a single operation, substantially as described.

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