

No. 751,900.

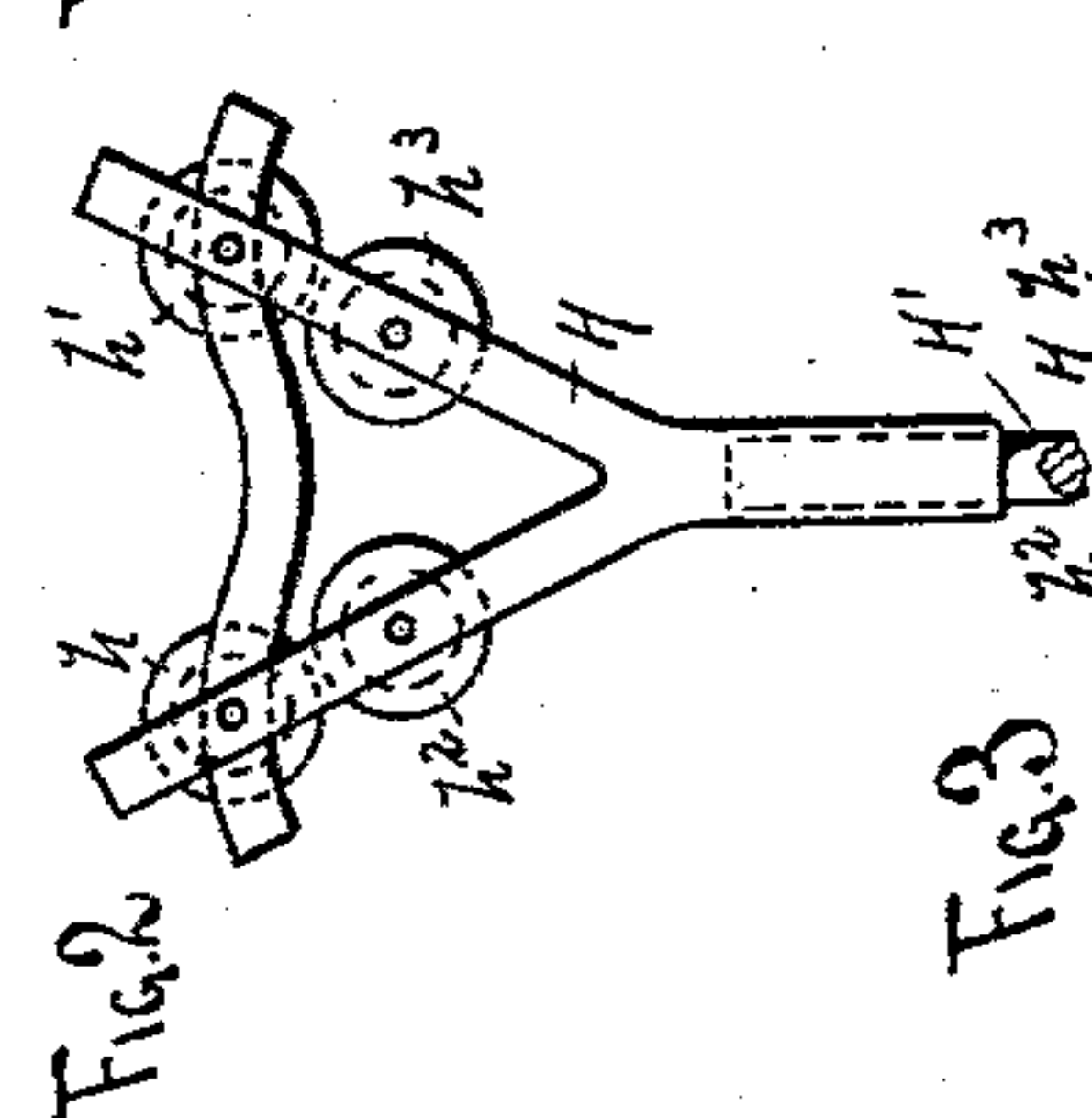
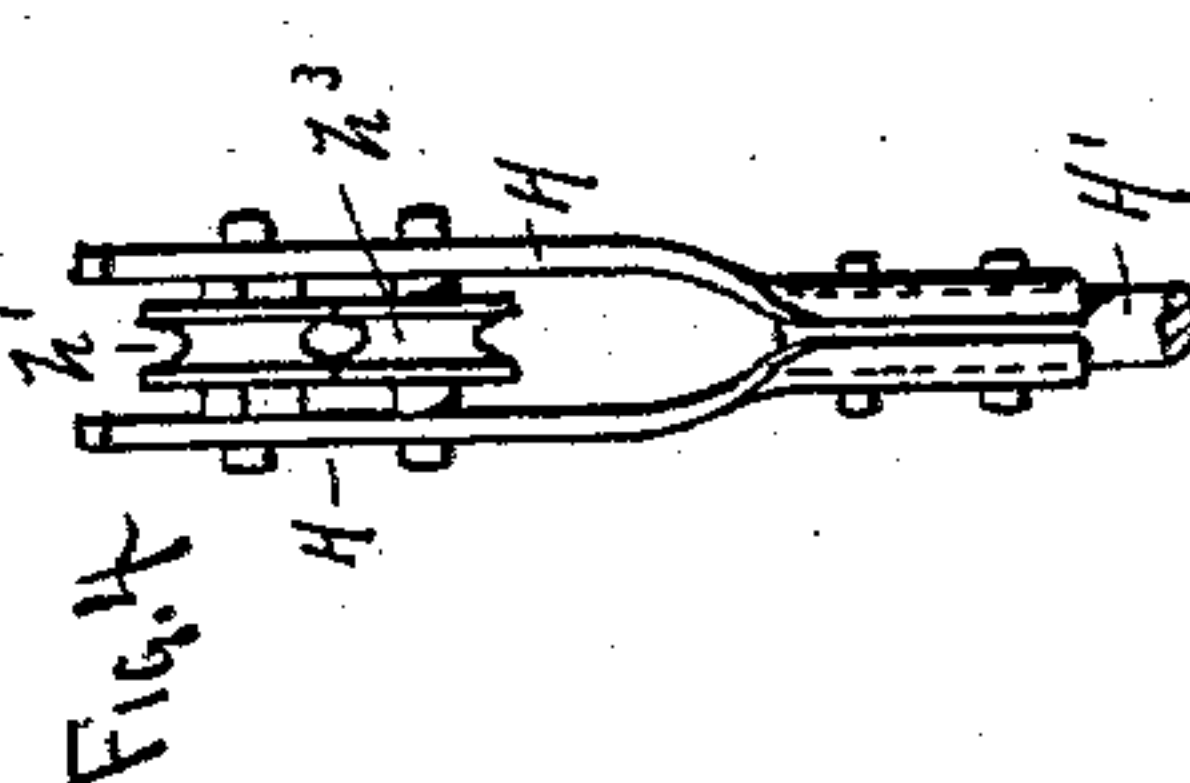
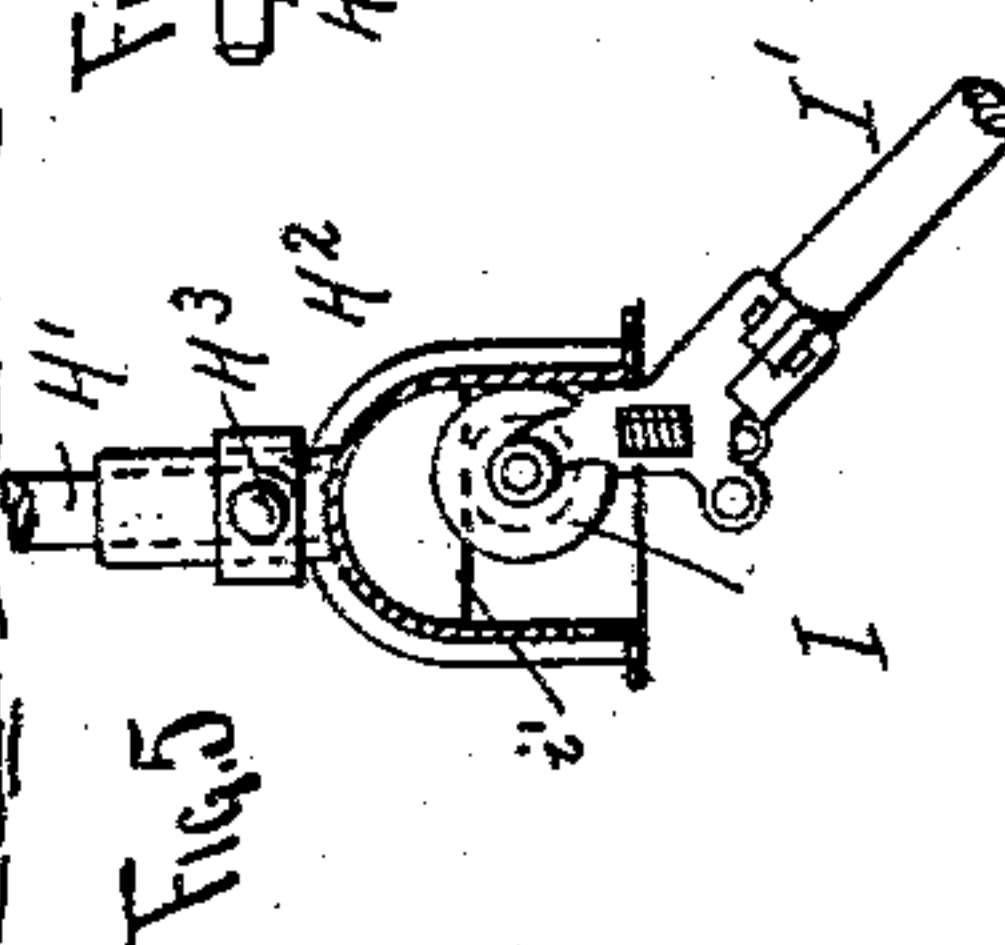
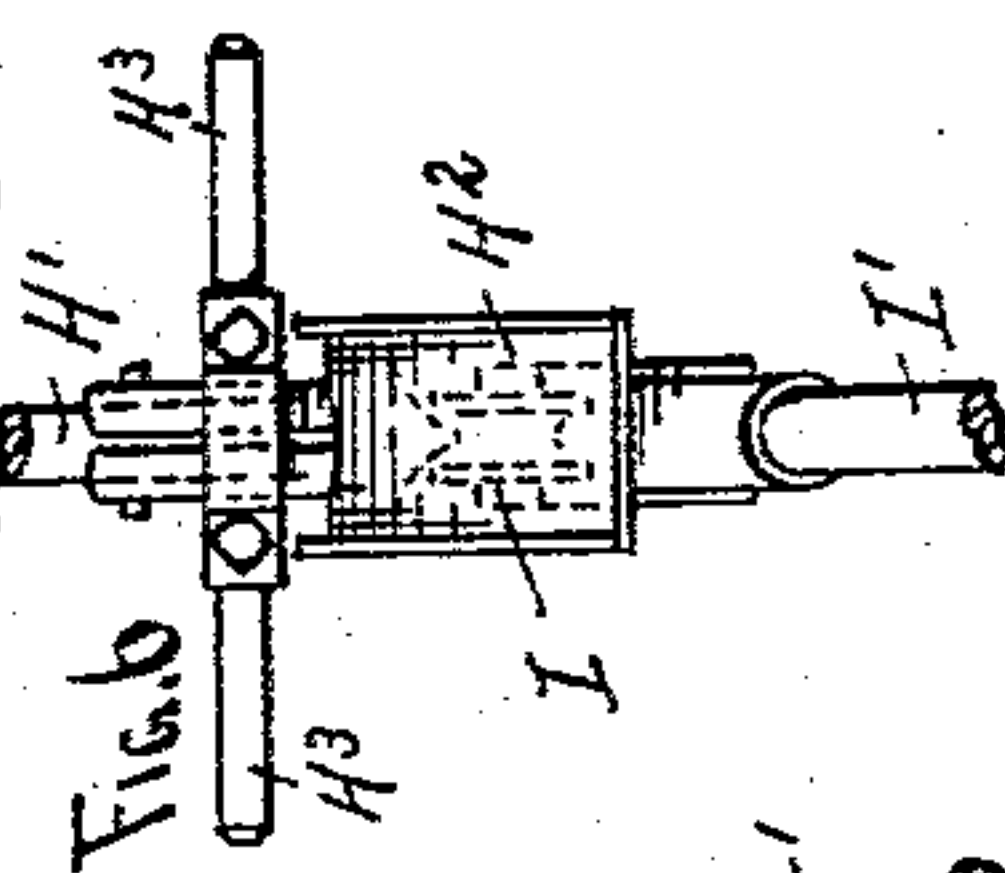
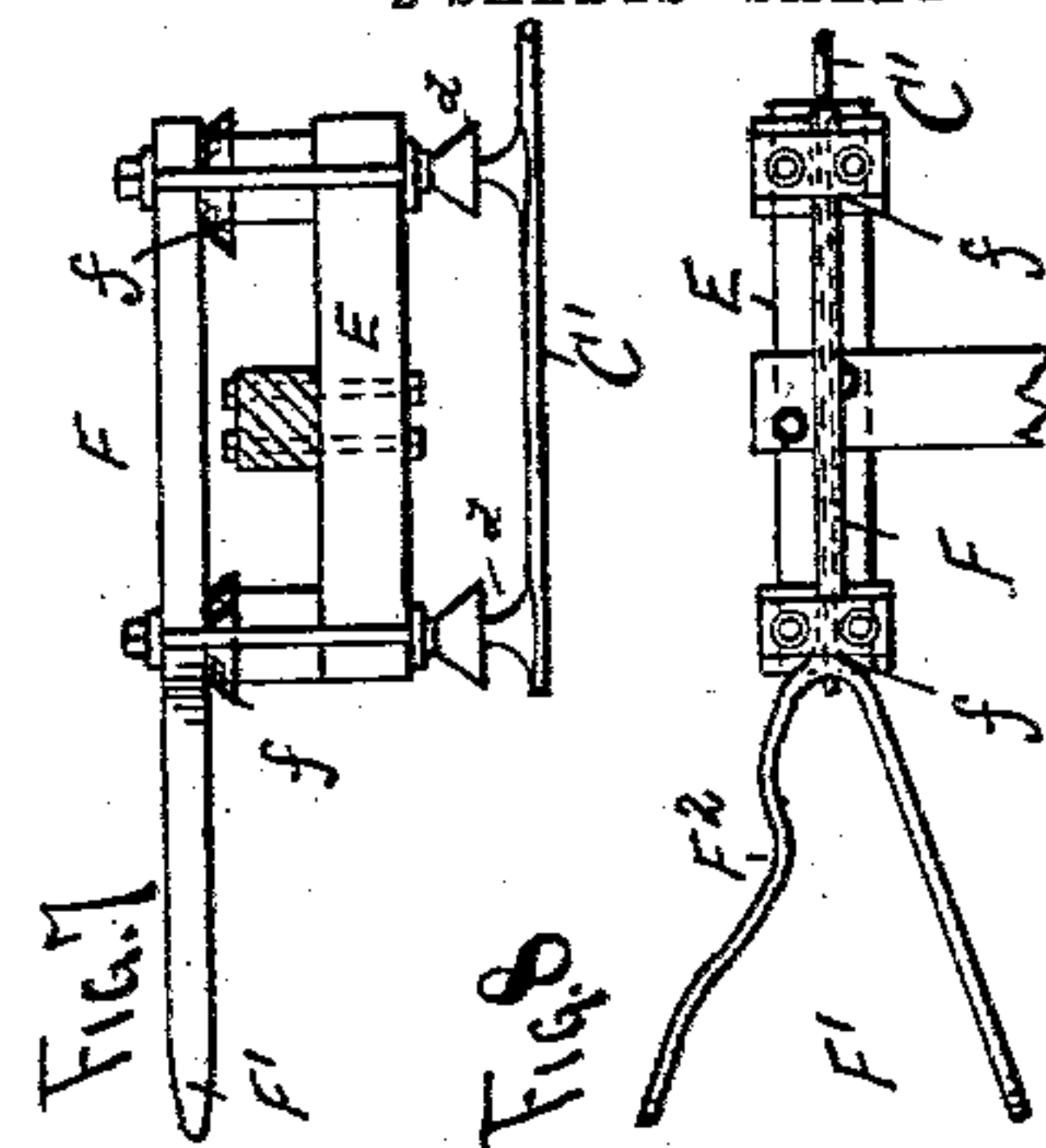
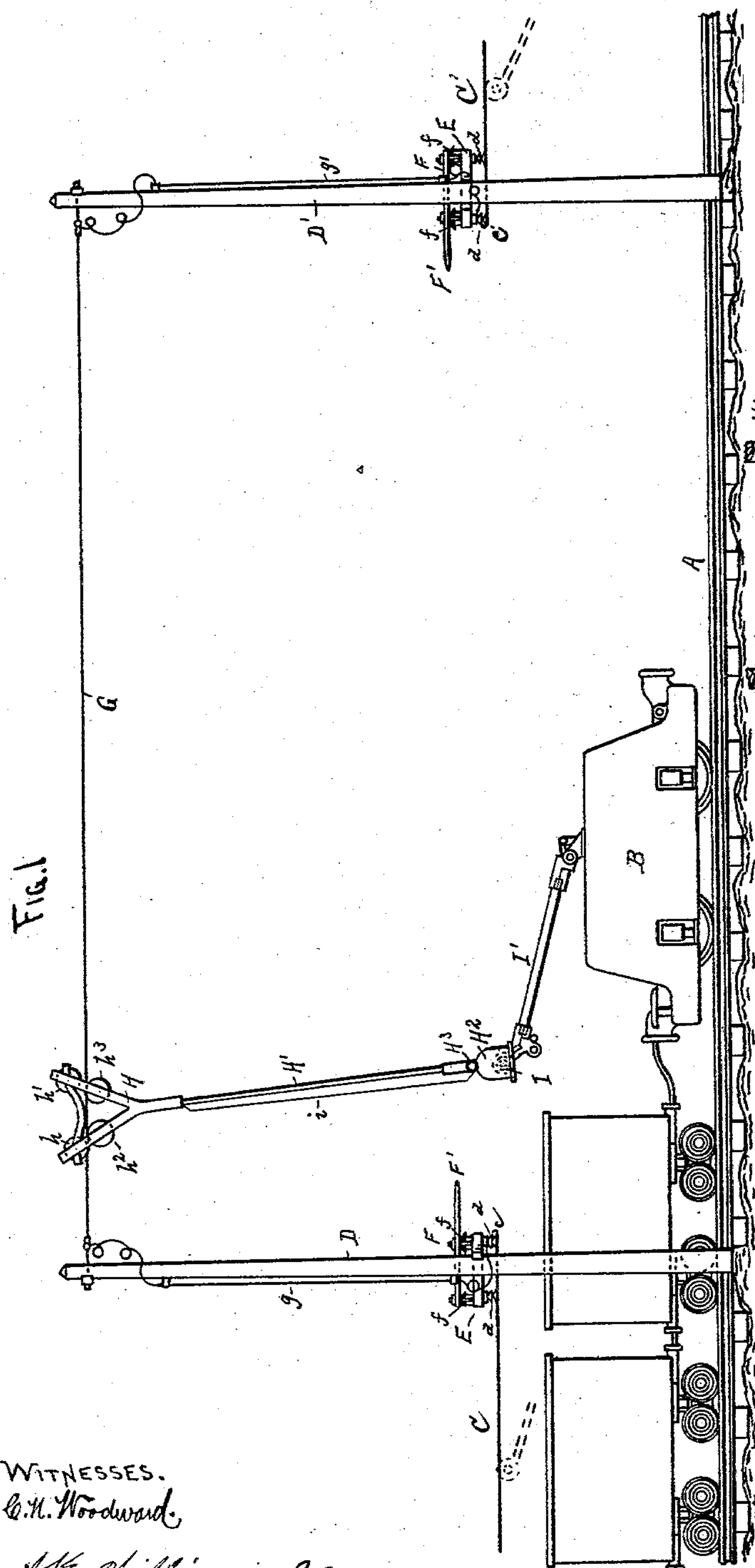
PATENTED FEB. 9, 1904.

J. M. COLLINS.
TROLLEY ROAD CROSSING.

APPLICATION FILED FEB. 2, 1901. RENEWED SEPT. 9, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



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By H. H. Bliss ATTORNEY.

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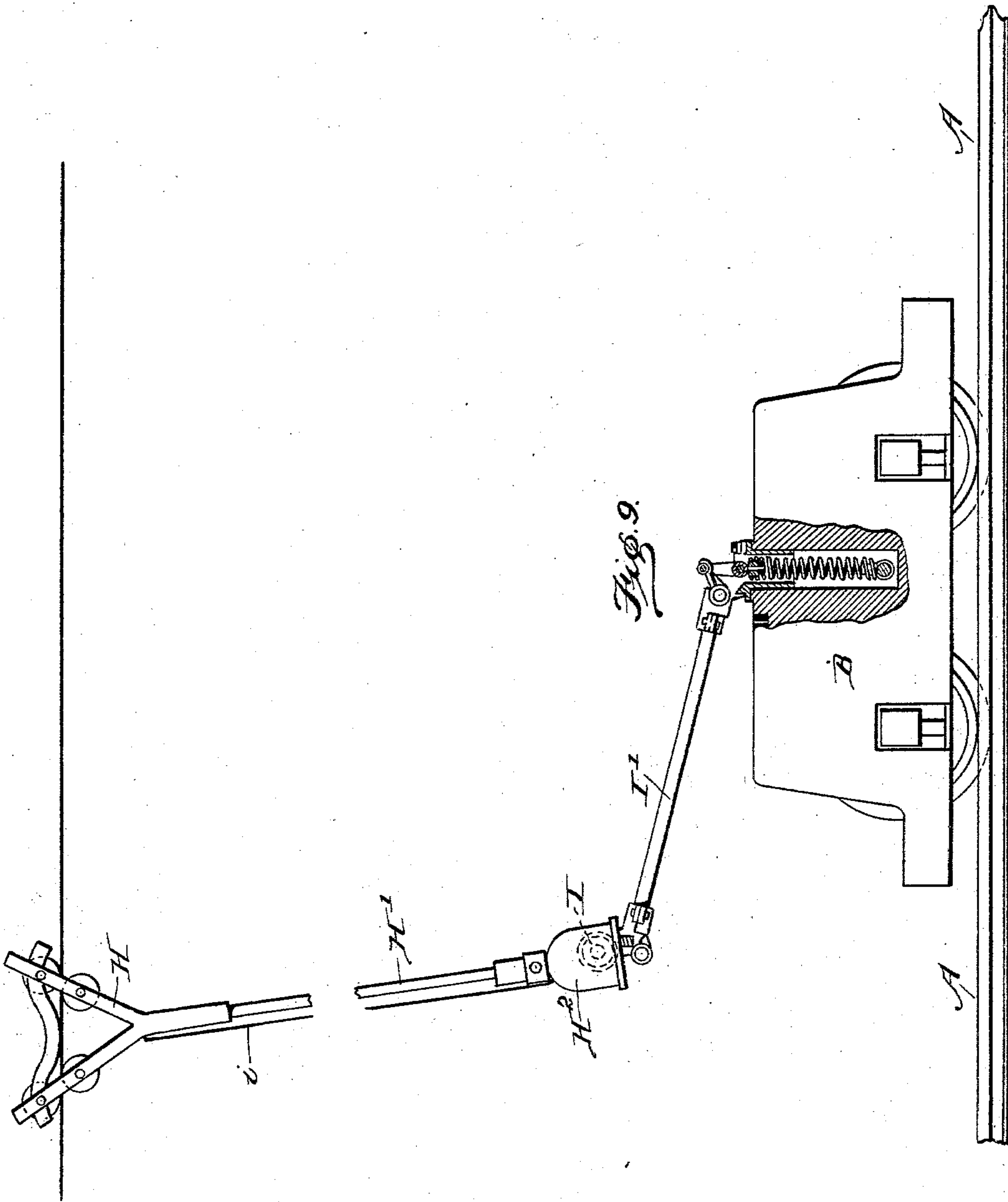
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2 SHEETS—SHEET 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

JAMES M. COLLINS, OF BYESVILLE, OHIO, ASSIGNOR TO JOSEPH A. JEFFREY, OF COLUMBUS, OHIO.

TROLLEY ROAD-CROSSING.

SPECIFICATION forming part of Letters Patent No. 751,900, dated February 9, 1904.

Application filed February 2, 1901. Renewed September 9, 1903. Serial No. 172,530. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. COLLINS, a citizen of the United States, residing at Byesville, in the county of Guernsey and State of Ohio, have invented certain new and useful Improvements in Trolley Road-Crossings, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a side elevation of the device complete. Figs. 2 to 8 show enlarged details of the parts detached. Fig. 9 is an enlarged side elevation of a mechanism embodying my invention, showing the locomotive partly in section.

In conducting mining operations and excavations and similar work in some localities where electric trolley-lines employing cars and locomotives of low altitude are used and with the trolley conductor-wires of correspondingly low altitude provision must be made whereby the presence of such low-altitude trolley-lines will not interfere with the ordinary uses of lines of roads crossed by the low-altitude lines, while at the same time enabling the crossing trolley-line to be operated continuously and without interruption from the "breaks" caused by the crossings.

To provide such a means of crossing is the object of the present invention, in which is comprised the removal of sections of the low-altitude conductor-wire at the crossings and substituting therefor sections of wire sufficiently elevated to permit of the ordinary uses of the crossing road and connecting the ends of the elevated section electrically with the adjacent portions of the low-altitude conductor-wire and providing each of the elevated sections with a traveling trolley-carriage having a depending end with which the trolley-wheel of the electric locomotive engages when the car passes beneath the elevated section to provide means whereby the current may be continued to the locomotive while passing the crossing.

My invention comprises the combination of an electric conductor, a traveling conductor, an auxiliary conductor movable along said electric conductor, and means whereby said

traveling conductor automatically engages with said auxiliary conductor to cause its travel with said traveling conductor.

Referring to the drawings, A represents the road-bed on which the locomotive B travels at a point where a road or other line crosses. The locomotive shown is of the conventional type employed in mines; but the invention may be employed in connection with any type of locomotive.

C C' represent the electric conductor, in this instance low-altitude trolley-line wires ending at *c c'* at opposite sides of the crossing roadway and supported by vertical posts D D'. The ends *c c'* are shown supported in the usual manner by the insulated hangers *d* from brackets E, the brackets also affording means for the support of bars F, having forked inner ends F' and insulated from the bracket by insulated couplings or standards *f*, as shown more clearly in Figs. 7 and 8, which represent one of the brackets and its attached forked bar enlarged.

G represents a portion of the electric conductor situated out of the main course of the line. As illustrated, it is a section of a trolley conductor-wire connected by its ends to the posts D D' at a sufficient distance above the road-bed B to prevent its presence being any obstruction to the ordinary uses of the roadway and connected electrically, as by wires *g g'*, to the main trolley-wires C C', so that the current is unbroken throughout the line. The wires *g g'* may be continuations of the conductor-wires C C', if preferred.

Mounted upon the section G is an auxiliary conductor movable along the said section. It is shown as a trolley-carriage consisting of a frame H, having trolley-wheels *h h'* above the wire G and guard-pulleys *h² h³* beneath the wire, so that the carriage will travel with the minimum of friction along the wire. The said four wheels constitute guiding devices to limit the swinging of the auxiliary conductor in the direction of the movement of the traveling conductor hereinafter described.

Depending from the carriage-frame H is a rod or pole H', having a socket or housing H² attached to its lower end. Means will be pro-

vided, as by wire i , whereby an electric circuit is maintained between the housing H^2 or a conductor-plate i , within it and the trolley-carriage H and conductor-section G .

5 When at the ends of section G , the housing H^2 and its connections will be retained by the forked bars $F F'$, so that the open lower end of the housing will be in position to receive the traveling conductor, such as a trolley-wheel I on the trolley-pole I' of the locomotive B , as the car passes along, so that as the trolley I leaves the end c or c' of the low-altitude trolley-wire C or C' it will at once engage the housing H^2 and carry the carriage
10 H with it along the wire G until the shank of the pole H' above the housing enters the opposite forked bar $F F'$, when the housing and its connected carriage will be stopped; but the trolley-wheel I will be drawn out of the housing and again run upon the main conductor
15 C or C' , as the case may be. Then on the return trip the housing and its attached carriage are again "picked up" by the trolley I and carried back again across the roadway.

20 It will thus be seen that the invention comprises means whereby the traveling conductor and auxiliary conductor engage with each other automatically to cause them to move together. It further comprises in the upwardly-acting trolley-arm I' means whereby one of
25 the conductors I and H^2 is yieldingly held in engagement with the other.

Insulated handles H^3 are provided upon the housing H^2 , whereby the carriage and its connected parts may be moved by hand from side
30 to side of the road, if required.

One or both arms of the forked portions F' of the bars F will preferably be provided with bent portions F^2 to serve to retain the housing and its connections with sufficient force
35 to prevent the carriage running along the section G of its own volition, but which will yield to the pressure of the moving trolley I when it engages the housing and permit the carriage to move along the wire G .

Means may also be provided, such as the usual spring which presses the arm I' upward, whereby the trolley-wheel I will be held in
40 the housing H^2 with sufficient force to resist the weight of the traveling carriage, but which will yield to release the trolley-wheel when the pole H' engages the forked bar $F F'$.

The vertical yielding of the trolley-pole on the car can be provided by employing any of
45 the pole attachments and supporting devices that are well known at the time of my invention—as, for instance, such as shown in Patent No. 684,950, dated October 22, 1901, to Cyrus Robinson, the present improvements
50 being, in fact, practically applied by me to cars of the character shown in that patent. Reference may be made thereto for fuller understanding, and in Fig. 9 in the drawings herein I illustrate such a well-known attachment and yielding support without making
55 60 65

any specific claim to these well-known parts. By this simple arrangement the presence of the low-altitude trolley-line will not interfere with the ordinary uses of the crossing road, and the means provided for effecting the passage of the low-altitude locomotive and its train of cars will not affect or interfere in any manner with the action of the latter.

The sections G may be placed at any distance above the ground, and as many may be inserted into the line as required, and they may be of any required length.

I have described my invention as being applied to an electric trolley-line, in which is situated an open space or break that is bridged or spanned by a conductor situated at a height considerably above that of the main trolley-line. When it is differently arranged, it is only necessary that the arm of the conductor or trolley which engages with the bridging connection should extend in a suitable direction from the conductor with which it engages to cause the contact-piece at its free end to occupy a position to be engaged by the trolley that travels along the main line when it reaches the open space or break therein.

The mechanism which I have illustrated as embodying my invention comprises a stop which positively limits the longitudinal travel of the movable conducting device or trolley that engages with the bridging connection. It also comprises means arranged to prevent the free end of the movable conducting device or trolley from swaying and also means that operate to maintain the free end of such trolley device in such relation to the end of the main trolley-line that the trolley carried by the car or locomotive shall pass directly from the line into engagement with the contact device carried by the arm of the conductor or trolley of the bridging connection when the car approaches the break in the main line and shall pass from such contact device back to the main line after the car has passed the break without necessitating the stopping of the car or the making of manually-effected connections.

The form of my invention illustrated is particularly devised for use in connection with an underrunning trailing trolley.

What I claim is—

1. The combination of a main trolley-line having a break or open space therein, a bridging connection for such space in electric connection with the main line on each side of the space, a conductor movable along said bridging connection and having a contact member with which the trolley that moves along the main line is adapted to engage, and a stop for limiting the movement of the contact portion of the said conductor, substantially as set forth.

2. The combination of a main trolley-line having a break therein, a bridging connection for such break arranged out of alinement with

the main line and having electric connection with the main line on each side of the break, and a conductor movable along the said bridging connection and provided with a contact member with which the trolley that moves along the main line is adapted to engage, the said contact member being arranged to come into alinement with the main line at the ends of the break, substantially as set forth.

3. The combination of a main trolley-line having a break or open space therein, an underrunning trolley arranged to engage with the said line, a bridging connection for the break in the main line, and a conductor movable along the said bridging connection and having a contact member with which the underrunning trolley is adapted to engage, the said contact member being arranged to occupy a position adjacent to the end of the line at the break therein, and constructed to maintain the trolley in engagement therewith, substantially as set forth.

4. The combination of a main trolley-line having a break or open space therein, a bridging connection for the break in the main line arranged at a higher level than the main line, a trolley arranged to move along the said connection and provided with a depending arm, a contact member with which the trolley that moves along the main line is adapted to engage and means for holding the said arm with the contact member in position adjacent to the end of the main line to receive the trolley as it leaves the main line, substantially as set forth.

5. The combination of a main trolley-line having a break or open space therein, a connection bridging the said space, arranged out of alinement with the main line, a trolley arranged to travel along the said bridging connection, having a member with which the main-line trolley engages, and means for directing the said member to the end of the main line on the far side of the break, whereby the trolley may automatically pass from the said member directly to the main line, substantially as set forth.

6. In an electric railway having trolley-wires of relatively low altitude and with open spaces at intervals in its trolley conductor-line, bridging conductor-sections across said open spaces and in constant electrical connection with the main-line trolley-conductors sufficiently above the road-bed of said railway to permit the passage of vehicles, contacts movable upon said bridging sections and with depending means substantially in horizontal alinement with the main-line trolley and with which the contact means of the locomotive on said railway will engage while passing said open space, substantially as set forth.

7. In an electric railway having open spaces at intervals in the trolley conductor-line, sections of conductor-wire bridging said open spaces and in electrical communication with

the main-line conductor, a contact movable along said bridging section and having a depending means with which the contact means of the locomotive will engage while passing said open space, said depending means being in substantial horizontal alinement with the trolley-conductor, and means whereby said depending means will be retained yieldably in position adjacent to the sides of said open space when not in use, substantially as set forth.

8. In an electric railway having open spaces at intervals in the trolley conductor-line, an electric locomotive having an underrunning trolley-contact engaging said conductor-wire, bridging sections connected across said open spaces, a contact movable along said bridging section, a rigid pole depending from said movable contact and having an electric contact at its lower end in substantial alinement with said trolley conductor-line and in electrical connection with said movable contact, and with which said trolley-contact of said locomotive engages while passing said open space, and arranged to maintain the said trolley-contact substantially in the horizontal plane of the main line as it passes the open space, substantially as set forth.

9. The combination in an electric railway having open spaces at intervals in the trolley-line thereof, of bridging conductor-sections across said open spaces, movable contacts upon said bridging-sections, contact means depending from said movable contacts and in substantial alinement with the trolley line-conductor, and guide-bars adapted to support said depending contacts yieldably in position at the sides of said open spaces, substantially as set forth.

10. The combination in an electric railway having open spaces at intervals in the trolley-line thereof, of bridging conductor-sections across said open spaces, movable contacts upon said bridging sections, a pole depending from said movable contact, an inverted-cup-shaped contact attached to the lower end of said pole and in constant electrical communication with said movable contact, guide-bars adapted to support said cup-shaped contact when at rest substantially registering with the ends of said trolley wire conductor, whereby means are provided for causing the trolley-contact on the locomotive on said railway to engage said contacts when passing said open spaces, substantially as set forth.

11. In an electric railway having open spaces at intervals in the trolley-conductors thereof, sections of conductor-wire bridging said open spaces, a carriage having trolley-rollers mounted to travel upon said bridging section, a pole depending from said carriage, a contact upon the lower end of said pole and in constant electrical connection with said carriage, and means whereby the contact means on the locomotive on said railway will automatically come into engagement with the said

contact and be held in engagement therewith while passing said open space, substantially as set forth.

12. In an electric railway having open spaces at intervals in the trolley-conductors thereof, sections of conductor-wire bridging said open spaces, a carriage having trolley-rollers mounted to travel upon said bridging section, a pole depending from said carriage, a contact upon the lower end of said pole and in constant electrical connection with said carriage, means whereby said depending contact will be supported in alinement with the main conductor-line, so that the conductor-contact of the locomotive on the said railway is caused to engage said depending contact when it leaves the ends of the conductor-wires at the sides of said open spaces, substantially as set forth.

13. In an electric railway having open spaces at intervals in the trolley conductor-line, sections of conductor-wire bridging said open spaces and in electrical communication with the main-line conductor, a contact movable along said bridging section, and means whereby said movable contact may be engaged by the contact means of the locomotive on the electric railway while passing said open space, and insulated handle upon said movable contact, whereby it may be caused to traverse said bridging section independent of the locomotive, substantially as set forth.

14. In an electric railway, vertical masts adjacent to the trolley conductor-wire at the sides of roads or other lines crossing said railway, open spaces in said trolley-wire between said masts, conductor-sections bridging said open spaces and connected by their ends to said masts at a sufficient distance above the said railway to permit the passage of vehicles, a contact movable along said bridging section, brackets connected to said masts and adapted to support the ends of said divided trolley-wires, guard-bars connected to said brackets and adapted to yieldably support said movable contact in alinement with said trolley-line conductor when at rest at the sides of the open space, and means whereby the contact means on the locomotives on said railway engage said movable contact when passing from said severed main-line conductor, substantially as set forth.

15. The combination of an electric conductor, having a portion out of line with the main line of the conductor, a traveling conductor, an auxiliary conductor movable along said portion, and means whereby said traveling conductor automatically engages with said auxiliary conductor to cause its travel with said traveling conductor.

16. The combination of an electric conductor, a traveling conductor, an auxiliary conductor movable along said electric conductor, and means whereby one of said conductors is yieldingly held in engagement with the other

to cause said traveling conductor and auxiliary conductor to move together.

17. The combination of an electric conductor, a traveling conductor, an auxiliary conductor movable along said electric conductor, and means for pressing said traveling conductor yieldingly into engagement with said auxiliary conductor, said means comprising a spring the degree of tension of which maintains said engagement.

18. The combination of an electric conductor, having a portion out of line with the main line of the conductor, a traveling conductor, an auxiliary conductor suspended from and movable along said portion, means for pressing said traveling conductor yieldingly into engagement with said auxiliary conductor, and stops for said auxiliary conductor.

19. The combination of an electric conductor, a traveling conductor, an auxiliary conductor movable along said electric conductor and having a housing open at its under side, and means for pressing said traveling conductor yieldingly into engagement with said housing.

20. The combination of an electric-conductor line having a portion situated out of the main course of said line, a movable conductor adapted to engage said line in its main course, an auxiliary movable conductor traveling along said portion of the line which is out of said main course, and means whereby said movable conductor automatically engages with and disengages from said auxiliary conductor.

21. The combination of an electric conductor, a traveling conductor, an auxiliary conductor suspended from and movable along said electric conductor, means whereby said traveling conductor automatically engages with said auxiliary conductor to cause its travel with said traveling conductor, and means for holding the lower end of the auxiliary conductor from lateral displacement.

22. The combination of an electric conductor, a traveling conductor, an auxiliary conductor movable along said electric conductor, means whereby said traveling conductor automatically engages in either direction of its travel with said auxiliary conductor to cause its travel with said traveling conductor, the auxiliary conductor having its portion which is engaged by said traveling conductor substantially in the line of the main portion of said electric conductor, and means for holding the auxiliary conductor at the end of its operative travel till returned by a reverse movement of the traveling conductor.

23. The combination of an electric conductor, having a portion elevated above the main line of the conductor, a traveling conductor, an auxiliary conductor suspended from and movable along said elevated portion, means whereby said traveling conductor engages

with said auxiliary conductor to cause its travel with said traveling conductor, and guiding devices which limit the swinging of the auxiliary conductor in the direction of the movement of the traveling conductor.

24. The combination of an electric conductor, a traveling conductor, an auxiliary suspended conductor movable along said electric conductor, means whereby said traveling conductor engages with said auxiliary conductor to cause its travel with said traveling conductor, and an insulated handle on the suspended conductor for shifting the latter.

25. The combination of a line conductor, a traveling conductor, an auxiliary conductor movable along said line, a socket on the auxiliary conductor open to receive the contact portion of the traveling conductor in either direction of movement of the latter, and means for maintaining the yielding engagement of the traveling conductor and socket and permitting their separation by excess of pressure.

26. In an electric railway, the combination of a traveling conductor, an auxiliary conductor connected with the source of electrical power and movable with and separable from the traveling conductor, and a contact device for uniting said conductors electrically movable under excess of pressure to permit the separation of said conductors and acting under less pressure to maintain the connection of said conductors during their travel, substantially as set forth.

27. In an electric railway, the combination of an electric conductor, a traveling conductor, an auxiliary conductor separable from and movable with the traveling conductor, and a yielding contact device movable under pressure between said traveling conductor and said auxiliary conductor, and acting to connect and to permit the separation of said traveling and auxiliary conductors, substantially as set forth.

28. In an electric railway, the combination of a traveling conductor, an auxiliary conductor separable from and movable with the traveling conductor, and adapted to receive and transmit electric power, an electrical contact device movable under excess of pressure between said conductors and acting to connect and to permit the separation of the same, and a spring controlling said contact device yieldingly.

29. In an electric railway, the combination of a traveling conductor, an auxiliary conductor, and an electrical contact device carried by one of said conductors, normally held in place to cause the engagement of said conductors in either direction of movement of the traveling conductor, and movable under an excess of pressure in either direction to permit the separation of said conductors, substantially as set forth.

30. In an electric railway, the combination of the car, the stiff pole thereon having an electrical contact device at its upper end, a

second pole having an electrical contact device at its upper end, and means for detachably connecting the said poles directly together, substantially as set forth.

31. In an electric railway, the combination of the line conductor having relatively low sections and a relatively high section, the car, the vertically-swinging trolley-pole thereon, a second pole permanently supported by and suspended from the elevated conductor-section, and means for detachably connecting said suspended pole directly to the upper end of the trolley-pole, substantially as set forth.

32. In an electric railway, the combination of the line conductor, the car, the trolley-pole on the car having an electrical contact device at its upper end, a supplemental contact device having a conductor depending therefrom, and means for connecting the lower end of said conductor to the upper end of the pole on the car, substantially as set forth.

33. In an electric railway, the combination of the car, the trolley-pole thereon, the electrical contact device on said pole, the trolley or carriage having two or more wheels forming a supporting-base, these wheels being on an elevated conductor-line, the conductor extending downward from said wheel-base and rigid in relation thereto, and means for connecting the lower end of the conductor detachably to the upper end of the car-pole, substantially as set forth.

34. In an electric railway, the combination of the car, the car-pole, the electric contact device on the pole, the movable dependent conductor permanently suspended from the current-supply conductor, and a receiver at the bottom of the depending conductor adapted to electrically engage directly with the contact device at the upper end of the car-pole, substantially as set forth.

35. In an electric railway, the combination of the car, the car-pole, a stationary conductor having one or more relatively low sections and one or more relatively high sections, an electrical contact device supported directly on the car-pole, a trolley or carriage on the relatively high conductor-sections, having a downwardly-depending conductor, and means at the lower end of said depending conductor for detachably connecting it electrically directly to the contact device on the car-pole, substantially as set forth.

36. In an electric railway, the combination of a current-supply conductor having one or more relatively low sections and a relatively high section, a conductor-section depending from the relatively high current-supply section, the car, a pole on the car, and an upwardly-pressed contact device on the pole adapted to engage with the under side of the relatively low conductor-section, and means for detachably connecting the depending conductor-section directly with the said trolley-pole, substantially as set forth.

37. In an electric railway, the combination of a current-supply conductor having one or more relatively low sections and a relatively high section, a conductor-section depending from the relatively high current-supply section, and movable longitudinally thereof, the car, the vertically-swinging contact device on the car adapted to move in engagement with the under side of the relatively low conductor-sections, and means for connecting the depending conductor-section directly to the said contact device, substantially as set forth.

38. In an electric railway, the combination of the current-supply conductor having one or more relatively low sections and a relatively high section, a conductor-section depending from the relatively high current-supply section, and movable longitudinally thereof, the car, the electrical contact device on the car, and means for maintaining said contact device in engagement with the under side of the relatively low conductor-sections, when the car is traveling beneath them, and in engagement with the said depending conductor-section when the car is traveling beneath the relatively elevated conductor-sections, substantially as set forth.

39. In an electric railway, the combination of the current-supply conductor having relatively low and relatively elevated sections, the conductors depending from said elevated sections and movable longitudinally thereof, the car, the electric contact device on the car adapted to move in engagement with the relatively low sections of said current-conductor, means for detachably connecting said contact device with the depending conductor-sections,

and means for preventing the lateral disengagement of said contact device on the depending section, substantially as set forth.

40. In an electric railway, the combination of the current-supply conductor having relatively low sections and one or more relatively high sections, supplemental conductors adapted to move along said relatively high sections, each having a frame or casing adapted to receive the engaging devices of a traveling conductor on a car, substantially as set forth.

41. In an electric railway, the combination of the current-supply conductor having relatively low sections and one or more relatively high sections, supplemental conductors adapted to move along said relatively high sections and to maintain electrical connection between said sections and the traveling conductor on the car, and means for holding said supplemental conductors adjacent to the ends of the low sections to insure their engagement with the traveling conductors, substantially as set forth.

42. An auxiliary conductor adapted to move along a current-supply conductor, and having an engaging device adapted to engage with the electrical contact device of a traveling conductor, and an insulated handle for shifting said auxiliary conductor, substantially as set forth.

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

JAMES M. COLLINS.

Witnesses:

EDW. HELLER,
HERMAN M. LEFFERT.