y Cortes, 136 U. S. 330, 10 Sup. Ct. 1031; Andrews v. Swartz, 156 U. S. 272, 15 Sup. Ct. 389; Bergemann v. Backer, 157 U. S. 659, 15 Sup. Ct. 727. The judgment of the lower court is affirmed, and the petitioner remanded to the custody of the proper state authorities.

THOMSON-HOUSTON ELECTRIC CO. v. ATHOL & O. ST. RY. CO.

(Circuit Court of Appeals, First Circuit. January 26, 1899.)

No. 229.

PATENTS—MOTOR SUSPENSION FOR RAILWAY CARS.

The Rice patent, No. 448,260, for an improvement in motor suspension for railway cars, the essential characteristics of which consist in the introduction and use of a double hinge, the motor frame being one leaf of the hinge, and the motor the other leaf, the first leaf being journaled on the driven axle so that the car axle constitutes the pivot for the first leaf of the hinge, while the armature axis serves as the pivot for the other leaf, analyzed and construed, and *held* not infringed by the Walker motor, which is constructed under the Uebelacker patent, No. 554,353, and the Short patent, No. 546,360.

Appeal from the Circuit Court of the United States for the District of Massachusetts.

This was a suit in equity by the Thomson-Houston Electric Company against the Athol & Orange Street-Railway Company for alleged infringement of two patents relating to railway motors.

For opinion in circuit court, see 83 Fed. 203.

Frederick P. Fish and James J. Storrow, for appellant.

Charles E. Mitchell (Henry B. Brownell, on brief), for appellee.

Before COLT, Circuit Judge, and WEBB and BROWN, District Judges.

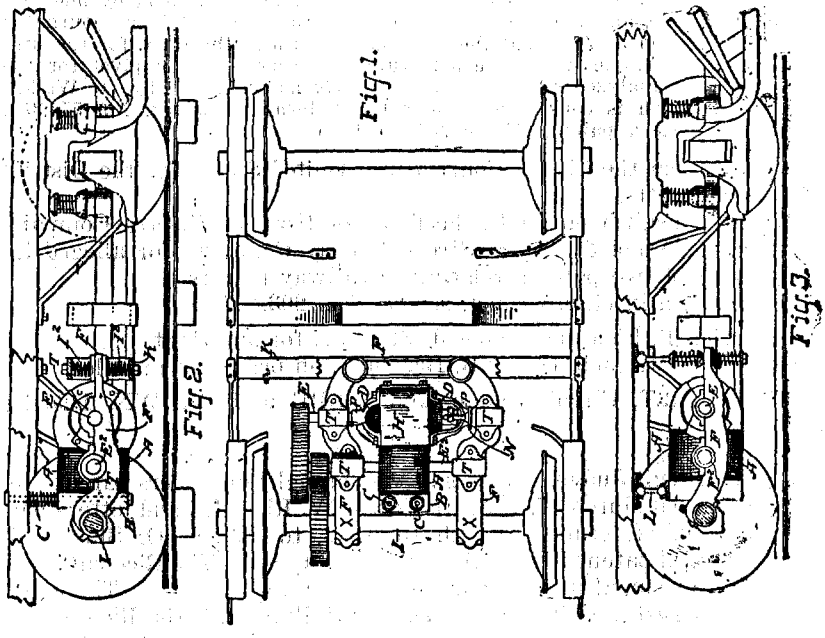
COLT, Circuit Judge. This suit was brought on letters patent No. 448,260, issued March 17, 1891, to Edwin W. Rice, Jr., and letters patent No. 470,817, granted March 15, 1892, to Francis O. Blackwell. The Blackwell patent is not pressed on this appeal. The Rice patent is for an improvement in motor suspension for railway cars. The court below dismissed the bill, holding substantially that, if the Rice patent is so broad as to cover the defendant's device, it is too broad to be sustained, and that, if the patent is valid upon a more narrow construction, the defendant does not infringe. The validity of the Rice patent is not seriously disputed, and we shall deal on this appeal simply with the question of infringement.

In his specification the patentee declares:

"My invention relates to the manner of mounting or supporting electric motors when applied to the propulsion of railway cars. The objects of my invention are to secure rigidity, strength, and an unvarying relation of motor and driving axle of the car, as well as accessibility for purposes of repair and an automatic adjustment of the commutator for variations of lead in different conditions of working. My invention relates particularly to those methods of suspension or support for the motor in which such motor is in part supported by an axle of the car. The principal part of my invention consists in the provision of a frame sleeved to the car axle, and provided with journal bearings for the armature axis and the axes of any intermediate gear

between the armature and car axle, the motor field magnet being supported on the armature axis. * * * My invention consists also in the novel construction and mounting of the frame itself, whereby I secure great rigidity. My invention consists also in other features of construction and combinations of parts, hereinafter described in connection with the accompanying drawings, and then more particularly specified in the claims. * * * By my construction of supporting frame and mounting of the parts, hereinbefore described, I not only secure stiffness and rigidity when the apparatus is subjected to strain, but also an adaptation of the mechanism to vibrations, jars, or movements of the car and supporting parts, which will maintain the mechanism in unchanged relation during all conditions of working. I am, moreover, able to secure ready accessibility to the electric motor, since, by simply removing the journal-bearing caps, T, the entire motor can readily be taken out through a trap in the car floor for making necessary repairs or for any other purpose."

The drawings of the patent are as follows:



"F indicates a frame of brass, iron, or other suitable material, consisting of two side or longitudinal pieces and a crosspiece, as shown, all cast or formed in one piece. The side pieces, F, are sleeved or journaled upon the axle, I, of the car or vehicle, and are provided likewise with journal bearings for the axes, E, E^2. The removable caps of such journal bearings are indicated at T. A, A, indicate the field magnet of an electric motor; H, the field-magnet poles of the same; and D, the armature mounted on the armature shaft, E. The armature shaft is connected through suitable intermediate gear with the car axle, I, as well understood in the art. The shaft of such intermediate gear is indicated at E^2. The frame, F, being supported at one end by the car axle, I, is elastically supported at its other end by some portion of the truck frame, K. For this purpose, the crossbar, F, is mounted between springs or cushions, I^2, I^2, supported by the frame, K, as indicated. The field magnet is supported at one end on the armature shaft, E, by sleeves, P, P, preferably of brass or other nonmagnetic material, which are carried by extensions from the field magnet pole pieces, H, as shown. The opposite end of the field magnet may be supported in any desired manner. I prefer

to support it elastically from the car body or from the truck frame; as, for instance, by means of an elastic support, such as indicated at C, Fig. 1, or by a flexible ball and socket joint, as indicated at L, Fig. 3. It will be observed that by means of this support for the motor, independent of the frame carrying the bearings therefor, said frame is relieved of the weight of the motor, and the weight is transferred to a support independent of such frame, while the rigid motor frame around the motor preserves an accurate alignment of the armature shaft and the driven axle of the vehicle. The particular manner of supporting the yoke end of the field magnet elastically or flexibly does not form any part of my present invention, and other means besides those shown may be employed in connection with the particular means hereinafter described for supporting the opposite end of the motor. * *. * The commutator brushes of the machine are carried by a yoke, N, supported by the frame, F, instead of by the field magnet or extensions from the pole pieces thereof; the brush arm over the sleeve, P, and arms, carrying the same into the open space between the latter, and over the commutator cylinder. It is well known that in a motor the lead is negative or opposite to that of a generator. Unless some means is provided for varying the position of the brushes upon the commutator, sparking will occur with changes of load, and particularly when a reversal in the direction of rotation takes place. By this method of suspension and mounting of the brush support, this tendency to sparking is automatically compensated for by the rotation of the field magnets about the armature. It will be noticed that, when a heavy load comes on, the motor frame will be depressed or raised, according to the direction of rotation of the armature; and, as one end of the field magnet is relatively fixed in position, the field magnet and armature will occupy different positions with respect to each other when the motor frame is raised or depressed."

In the Rice patent, the U-shaped frame is described as made of brass or other suitable material, and consists of two side or longitudinal pieces and a crosspiece all cast in one piece. The side pieces are sleeved or journaled upon the car axle, and are provided with journal bearings for the armature shaft and any intermediate shaft. The journal bearings have removable caps. The armature shaft is connected through intermediate gear with the car axle. The frame is sleeved at one end upon the car axle, and is spring-supported at the other end upon some portion of the truck frame. For this purpose the crossbar of the frame is mounted between springs or cushions, supported in the truck frame. The motor at one end is sleeved or pivoted to the armature shaft, which is journaled in the frame, and at the other end is supported elastically from the car body or truck frame. The spring shown in the drawing makes the support elastic against any upward movement of the yoke end of the field magnet. Another form shown consists of a flexible ball and socket joint. The brushes are carried by the frame, instead of by the field magnets. By this method of suspension and mounting of brushes, an automatic adjustment of the commutator for variations of lead in different conditions of working is secured.

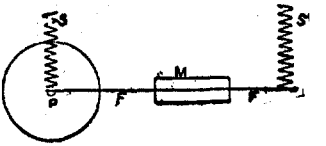
It was old at the date of the Rice invention to sleeve a motor frame at one end upon the driven axle of a car, and support the other end by springs connected with the car body or truck frame so as to secure a partial spring support, and at the same time keep the gearing between the driving and driven axle at all times in proper co-operation. This is shown in the prior patents granted to Sprague (Nos. 324,892, 406,600, 372,824, 387,745) and to Bentley (Nos. 377,229, 377,230).

The Sprague patent of August 25, 1885 (No. 324,892), had for its

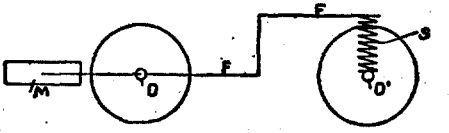
object the relief of the driving axle from the dead weight of the motor, at the same time keeping the armature shaft properly geared with the other parts, whatever the position of the field magnet; and this was accomplished by hanging the yoke end of the field magnet from a cross-piece of the truck frame by springs, and sleeving the other end upon the driven axle by a frame-like extension. Sprague made the connection of the entire motor with the truck through springs. The patent says:

"By this feature of the invention, the hammering effect which would result from supporting the motor directly upon the axle will be reduced to the minimum."

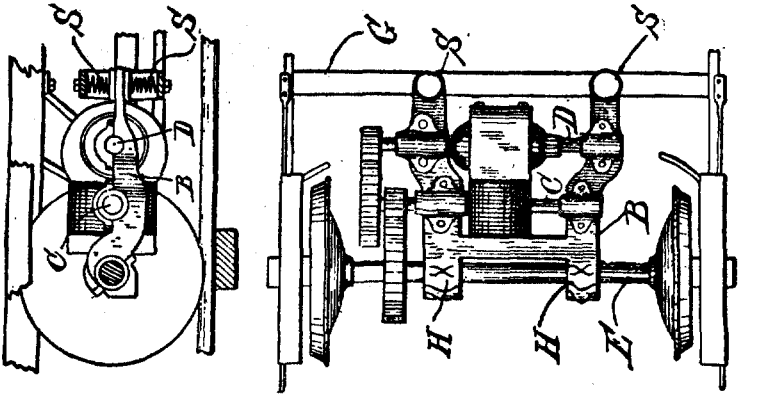
The following cut illustrates the Sprague device:



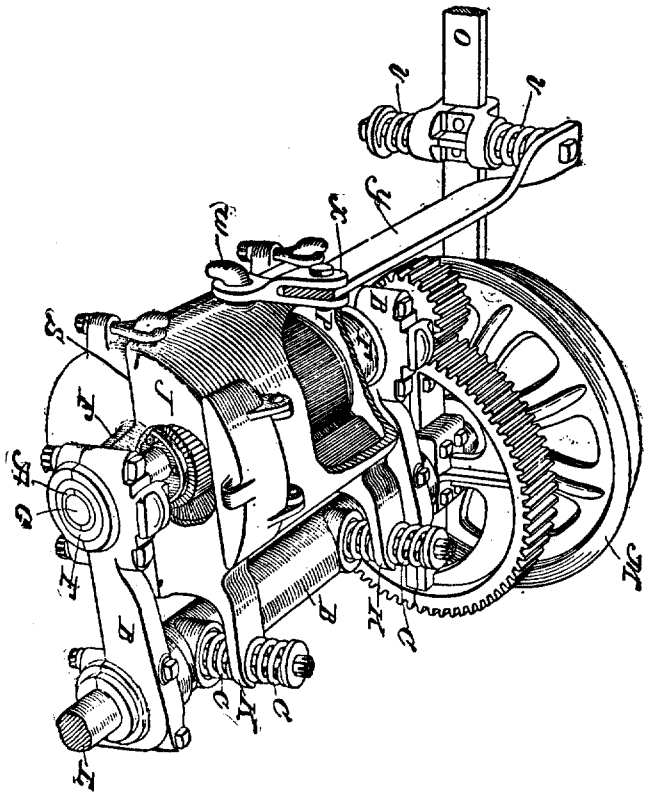
In the Bentley patent (No. 377,229, January 31, 1888) the motor is shown and described as supported on the outside of the driven axle, and is upheld by a counterbalancing spring connection with the opposite axle. The U-shaped frame is journaled to the driven axle. The construction of Bentley is illustrated in the following cut:



In the modified or commercial form of the Bentley device, the motor, with its supporting framework, was turned around so as to come on the inner side of the axle, in which case the two projecting side pieces of the framework were upheld by a spring connection with the motor truck. The commercial form of the Bentley device is illustrated by the following drawings:



The Walker motor used by the defendant is constructed under the Uebelacker patent, No. 554,353, dated February 11, 1896, and the Short patent, No. 546,360, dated September 17, 1895, and is represented by the following drawing:



In the Walker device the motor frame is in the form of a casing inclosing all the operative parts. The casing is composed of an upper and a lower half. The upper half of the motor casing is provided with projections, K, on the axle side of the motor. The projections are supported by springs, C, C, the lower end of the springs resting in cup-shaped depressions in the transverse crossbar of the U-shaped frame, B, B, B, or in that portion of the frame which surmounts the car axle. The side of the motor casing away from the axle is provided with a nose, W, which through the medium of link, X, and crossbar, Y, is also supported by the springs, V, V. It follows from this construction that the motor rides freely on springs, and readily adjusts itself without strain on any part. The motor frame or casing, carrying the working parts of the motor, is trunnioned in the free projecting ends of the U-shaped auxiliary frame, B, B, B, by means of hollow cylindrical projections integral with the casing. The trunnions, F, are bored out on the inside to receive the bearing sleeves,

which support the armature shaft, G. The outside of the motor trunnions rock in the supported ends of the U-shaped or auxiliary frame, thus permitting a cushioned seesaw motion to the motor, which is upborne by springs, and is shielded against any blow or shock. The fundamental principle of this apparatus is supporting the motor upon springs, the motor itself being connected with the auxiliary frame by which the proper meshing of the gearing is at all times secured.

No doubt, the object of both the Rice and Walker motors was to accomplish results which had been imperfectly realized in the prior art, namely, to prevent the hammer blow due to the weight of the motor, or the inertia blow due to the unyielding mass of the motor. To effect this, it was necessary that the motor should be floated in some way, and have a swinging or rocking movement, and that the pressure of its weight on the driven axle should be minimized. While the result sought to be obtained in this class of motors is the same, it seems to us that the organization of the operative mechanism and the means employed in the Rice and Walker motors are radically different. The practical utility of the Rice invention is doubtful. Instead of supporting the armature shaft by the field magnet, the heavy field magnet is supported by the armature shaft. In the Rice device the motor frame supports the armature shaft, which also carries the brushes. In Walker the frame which carries the motor does not support the armature shaft, but it is supported in the lower auxiliary frame. One object of the Rice invention was to vary the position of the brushes upon the commutator to meet the requirements of the motor "lead." For this reason he keeps the brushes upon the motor frame, that the relation of the brushes to the commutator may change, and so prevent sparking. Rice sleeved the motor frame upon the axle. By this means he relieved the motor frame of some of the weight of the field magnet, although the frame still supports a part of that weight, and transmits it as a dead weight to the driven axle upon which it is sleeved. The part of the motor which carries the brushes and bearings for the armature remains sleeved to the axle, and shares in the jars and bumps imparted to the driven axle by the track. This organization is absent from Walker. With Rice the frame carries the armature shaft, and the field magnet, instead of being supported on the frame directly, is supported by sleeves upon the armature. "The armature shaft supports the field, and said shaft is in turn supported in bearings in the frame." This arrangement of operative parts is not found in Walker. In Walker the motor frame proper supports the motor independently of the car body, and practically no part of the motor falls as a dead weight on the driven axle.

The contention of the complainant is that the Rice patent, for the first time in the art, describes a motor which floats bodily up or down with relation to the driven axle, and still maintains a fixed relation between the motor gear wheel and the axle gear wheel, which is essential; that this conception of Rice was effected by the introduction and use of a double hinge, the motor frame being one leaf of the hinge, and the motor the other leaf; that it is essential to the Rice construction that the first leaf or motor frame should be journaled upon the

driven axle, so that the car axle constitutes the pivot for the first leaf of the hinge, while the armature axis serves as a pivot for the other leaf of the hinge. Combined with the above mechanism there must be a pair of spring supports, one of which must be independent of the frame. Assuming this conception to be novel and ingenious, the vital and practical question remains whether the defendant's motor accomplishes substantially the same result by substantially the same or equivalent instrumentalities. In the Rice patent nothing is said about a double hinge, but we find described certain mechanism which it is said will accomplish certain results, and our first general inquiry should be directed towards a comparison of the Rice device with the device of the defendant. If, as we find, the two structures are substantially different, there can be no infringement unless it may be of some specific claim of the Rice patent.

Infringement is alleged of claims 1, 2, 9, 10, 11, 12, 13, 17, 19, and 20. Claim 1 is as follows:

"(1) In an electric railway motor, the combination of a motor field magnet sleeved at one end on its armature shaft, and an armature shaft journaled in an independent frame carried at one end by an axle of the car, and at its other by the truck frame."

It is sufficient to say, respecting this claim, that the Walker motor does not have this "independent frame." The Rice motor frame is sleeved to the driven axle at one end, and supported from the truck frame at the other end. It carries one end of the field magnet, the other end being attached (preferably elastically) to the car body or truck frame. The Walker motor frame carrying the motor is not sleeved to the driven axle, and is not "independent," in the sense of the Rice patent. The U-shaped frame of Walker, which is not the motor-supporting frame, is carried at one end by the driven axle, and at the other by the motor frame, and not by the truck frame or car body. The motor frame in which the armature shaft is journaled in the Walker structure is not independent of the field magnet.

Claim 2 is as follows:

"(2) The combination, substantially as described, of the journal-bearing frame for the armature elastically supported at one end, and sleeved to an axle of the car at the other, and a field magnet supported on the armature axis, and at its other by an independent support."

From what we have already observed, it is clear that the Walker motor does not have the journal-bearing frame for the armature elastically supported at one end, and sleeved to the axle of the car at the other.

Claim 9 is as follows:

"(9) In an electric railway motor, the combination, substantially as described, of a motor frame in which the armature of the motor is mounted, and a support for the motor independent of such frame, as and for the purpose described."

The armature of the Walker motor is not mounted in the U-shaped frame, but in journal boxes attached to the motor casing. There is no support for the motor independent of the motor frame, within the meaning of the Rice patent.

Claim 10 is as follows:

"(10) In an electric railway motor, the combination, substantially as described, of a frame provided with bearings for the gear which transmits motion from the armature to the car axle, in combination with an independent elastic support for the motor, sustained independently of said frame."

The "independent elastic support for the motor sustained independently of said frame" is the support referred to in the specification of the end of the motor which is furthest from the armature. This support holds the end of the motor nearest the axle relatively fixed, and so prevents that end of the motor from sharing in the elevation or depression of the other end, as the frame carries it downward or upward. This combination has not been adopted by Walker.

Claim 11 is for the combination in an electric railway motor of a frame sleeved on the car axle and an elastic support independent of the frame, and sustaining the field magnet. The frame here referred to is the motor frame, which, as already stated, is not sleeved to the axle in the Walker device; nor has the Walker motor the elastic support independent of the frame.

Claim 12 is as follows:

"(12) The combination, in an electric railway motor, of a rigid frame for holding the parts in proper alignment with the car axle, and a spring support independent of said frame, whereby the frame may be relieved of the weight of the motor."

The spring support independent of the frame is evidently the support for the yoke end of the field magnet, the other end being sustained by the armature shaft. This construction, as we have said, is not found in the Walker motor.

Claim 13 is as follows:

"(13) The combination, in an electric railway motor, of a pivoted frame sustaining the armature, and a field magnet sustained on pivoted bearings, at one end carried by the frame, and at the other by a support independent of the frame at the outer end."

Walker has no such pivoted frame sustaining the armature. The Walker armature is sustained in the journal boxes, which are fastened to the motor casing. The casing is not pivoted at either end, but is upheld by springs. Walker does not have a field magnet sustained on pivoted bearings such as are described in the Rice patent, and he has no field magnet sustained by a support independent of the frame at the outer end.

It is apparent that the combination of claim 17, consisting of a supporting frame provided with journal bearings for the armature shaft of the motor, and a motor field magnet supported on the armature by sleeves thereon, and by supports attached to the truck frame or car body, is not contained in the Walker structure.

Claims 19 and 20 are as follows:

"(19) In an electric railway motor, a rigid supporting frame for the armature and gear shafts, said frame consisting of two longitudinal or side pieces sleeved on an axle of the car, and carrying the journal bearings for said shafts, and a cross piece; said side and cross pieces being integral, and forming three sides of a continuous frame, independent of the motor, as and for the purpose described.

"(20) In an electric railway motor, a rigid supporting frame for the electric motor, consisting of the side or longitudinal pieces sleeved to an axle of the car, and a uniting cross piece integral with them; said side and cross pieces forming three sides of a continuous frame, independent of the motor."

The rigid supporting frame mentioned in these claims is the motor frame of the Rice patent, which is not found in the Walker apparatus. Nor does the Walker motor frame proper show the side pieces sleeved on the axle of the car, and carrying the journal bearings for the shafts, nor a motor frame independent of the motor. From observations already made, it is manifest that the Walker motor has not appropriated the combinations covered by these claims.

In addition to the matters that we have already referred to in detail, we think, with the learned circuit judge, that:

"It cannot be denied that the respondent was within its right in using its peculiar motor, which normally locates its armature at its axis, and, as a necessary element to the operation of its motor, in using its armature shaft as a pivot. All this is in the common field of mechanical construction. What would remain would be the question of holding the motor in position. This would, in ordinary course, be by support either at its center or at its radial poles, and, in either case, rigidly or elastically. In the normal work of construction, the mechanical engineer must select; and, in an art of so common a character as that of so suspending heavy working parts elastically as to minimize the shock, he might rightfully select either. This is all which has been done by the respondent. Therefore, if complainant's patent is so broad as to cover respondent's device, it is too broad to be sustained."

The conclusion we have reached is that, in construction and mode of operation, the Walker motor is distinctly different from that described in the Rice patent, and that it does not infringe any of the claims relied upon by the complainant. The decree of the circuit court is affirmed, with the costs of this court to the appellee.

BRIDGEPORT MFG. CO. et al. v. WILLIAM SCHOLLHORN CO.

(Circuit Court of Appeals, Second Circuit. January 2, 1899.)

No. 29.

PATENTS—VALIDITY AND INFRINGEMENT—PLIERS.

The Bernard patent, No. 427,220, for pliers having parallel jaws and sheet-metal handles, so attached as to apply the power at both sides of the jaws, and having an unobstructed opening between the jaws for the passage of a rod, wire, or tool, construed, and *held* valid and infringed as to claim 1, and not infringed as to claim 2.

Appeal from the Circuit Court of the United States for the District of Connecticut.

This was a suit in equity by the William Schollhorn Company against the Bridgeport Manufacturing Company and others for alleged infringement of a patent for an improvement in pliers. The circuit court rendered a decree for complainant upon the first claim of the patent involved (84 Fed. 674), and the defendants have appealed.

Henry Schreiter and Alexander Van Cott, for appellants.

John K. Beach, for appellee.

Before WALLACE, LACOMBE, and SHIPMAN, Circuit Judges.

SHIPMAN, Circuit Judge. The questions upon this appeal are in regard to the validity and infringement of claim 1 of letters patent No.