No. 709,124. Patented Sept. 16, 1902.

J. UNSER.

BRAKE MECHANISM FOR MOTOR VEHICLES.

(Application filed Mar. 8, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig.1

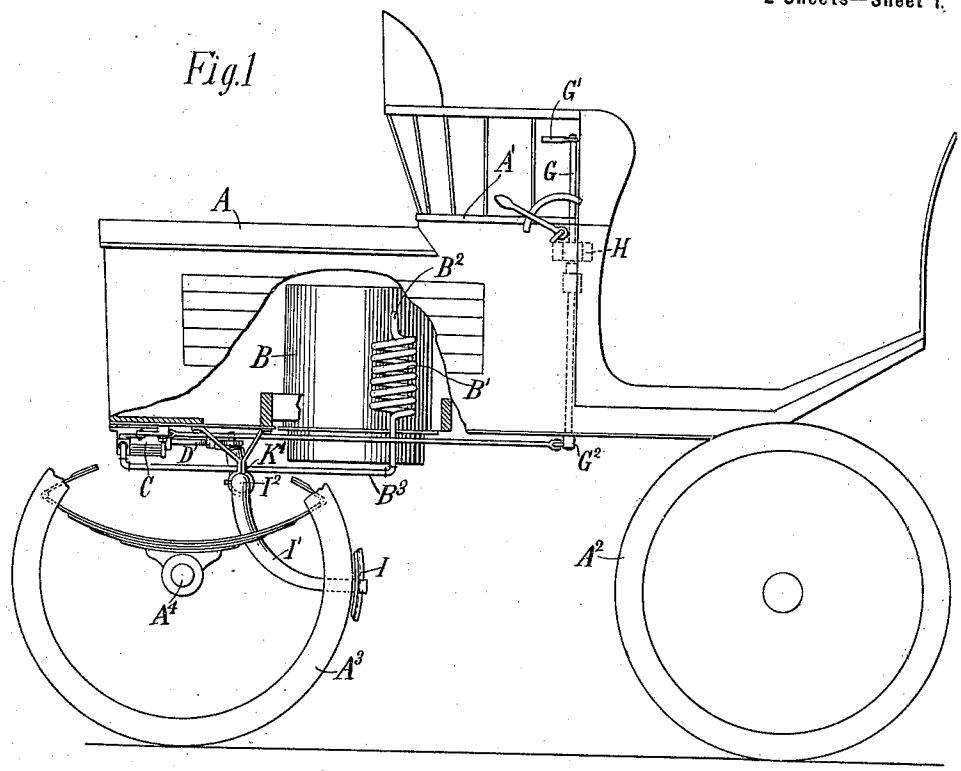


Fig.2

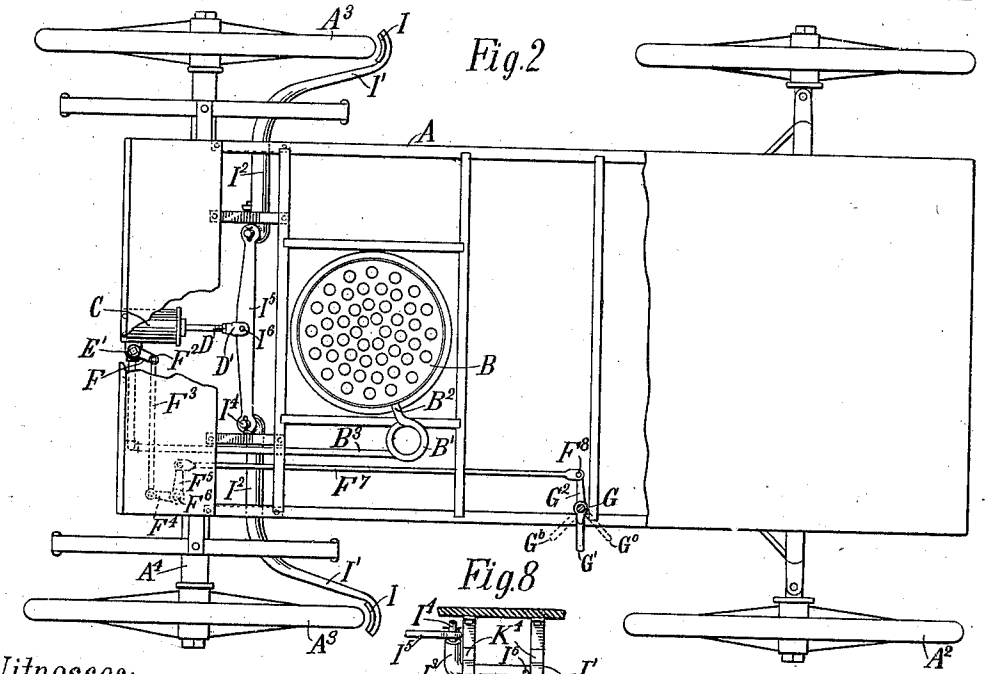


Fig.8

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(No Model.) 2 Sheets—Sheet 2.

Fig. 3

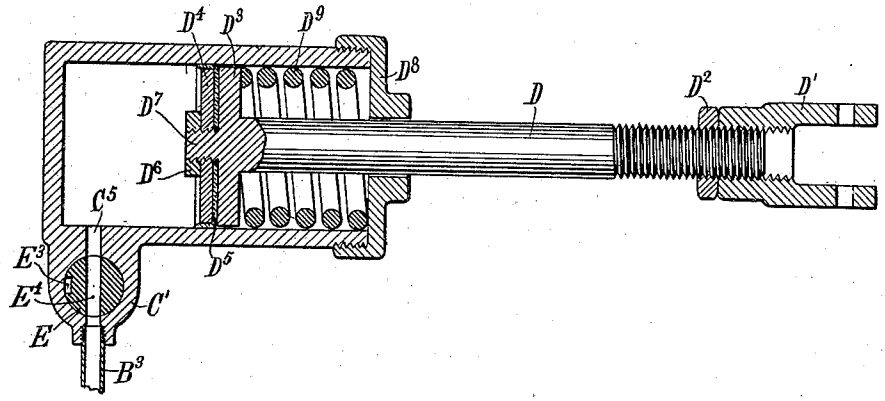


Fig. 4

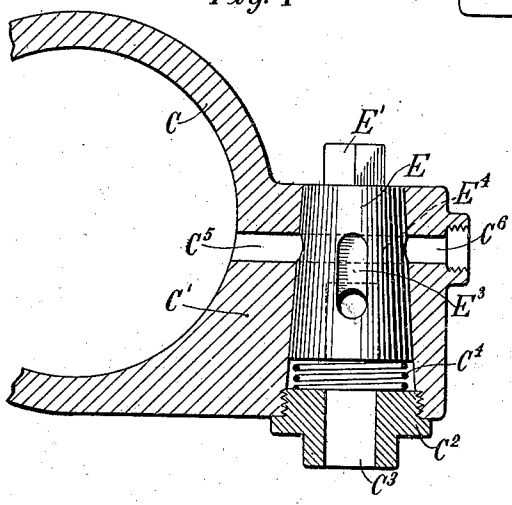


Fig. 5

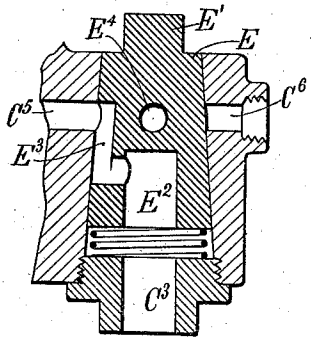


Fig. 7

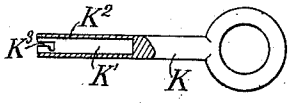


Fig. 6

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UNITED STATES PATENT OFFICE.

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BRAKE MECHANISM FOR MOTOR-VEHICLES.

SPECIFICATION forming part of Letters Patent No. 709,124, dated September 16, 1902.

Application filed March 8, 1901. Serial No. 50,329. (No model.)

To all whom it may concern:

Be it known that I, JOHN UNSER, a citizen of the United States, residing at Carthage, in the county of Jefferson and State of New York, have invented a new and useful Brake Mechanism for Motor-Vehicles, of which the following is a specification.

My invention consists in a novel form of brake mechanism for motor-vehicles more especially applicable to steam motor-vehicles and in the combination therewith of an improved locking device for such brake mechanism.

The exact scope of my invention will be pointed out in the appended claims.

In the accompanying drawings, in which like reference characters refer to similar parts in the various views, Figure 1 is a side view, partly broken away, of a motor-vehicle with my brake mechanism attached thereto. Fig. 2 is a plan view of the same. Fig. 3 is a horizontal axial section taken through the brake-cylinder and valve-casing. Fig. 4 is a section transverse to the axis of the brake-cylinder, through a part of said cylinder and the valve-casing, showing the valve in position therein. Fig. 5 is a detailed view showing the valve in a different position. Fig. 6 is a detailed view of the mechanism for locking the brake-rod in position. Fig. 7 is a detailed view of the key for operating said brake-locking mechanism, and Fig. 8 is a detailed view showing the brake-arms and connections therefor.

A represents the body of the motor-vehicle, having wheels A^2 and A^3 and being provided with the usual seat A′ for the operator. The vehicle is adapted to be driven by the boiler B in the usual manner in which steam motor-vehicles are operated, the details of the operating mechanism in this case not being shown, since they are well known in this art. The wheels A^3 are of course driven in any suitable manner by the driving-axle A^4.

The condenser-worm B′ is connected at its upper part to the boiler B at the point B^2 and communicates with the steam-space within the boiler. The lower end of the worm is connected with the pipe B^3, which communicates with the valve-casing C′, which is cast integral with the brake-cylinder C. Within the cylinder C, as will be apparent by reference to Fig. 3 of the drawings, there operates the piston-rod D, to which is integrally attached the piston D^3, provided with a cup-leather packing D^5, held in place by the packing-plate D^4, which is screwed up against the packing by the nut D^6, which engages the screw D^7 on the piston. The piston-rod D projects through the cylinder-head D^8, which is screwed upon the front end of the cylinder and fits loosely within the same, so as to allow the escape of air within the cylinder during the operation of the device, while at the same time the piston-rod is guided by suitable ribs on the cylinder-head, which it engages. Within the cylinder and bearing upon the front end of the piston and also against the cylinder-head is the strong spiral spring D^9, which serves to withdraw the brakes from operative engagement with the wheels. The front end of the piston-rod is threaded, and there is screwed upon it the yoke D′, which may be locked in any desired position on the piston-rod by the lock-nut D^2. This yoke D′ is connected with equalizer-bar I^5 by the pivot I^6, which gives the proper pivotal connection between these two parts. The two brake-arms I^2 are mounted in suitable bearings K^4 on either side of the machine, so that they can rotate about a horizontal axis. On the outer ends of these arms are the extensions I′, carrying the brake-shoes I and moving them into proper position to engage the driving-wheels A^3 when the brake is operated. Instead of arranging the brake-shoes to engage directly with the traction-wheels of the vehicle I may employ a friction-brake which engages with any other moving part of the operating means for driving the vehicle and which is actuated from my brake-operating means through any desired connections. The inner ends of the brake-arms I^2 are cranked, as is shown in Figs. 2 and 3, and the upper ends are reduced, as at I^4, so that the ends of the equalizer-bar I^5 pass over them and are held in this position by suitable split pins, as shown. This gives the requisite freedom of motion between the ends of the equalizer-bar and the brake-arms.

Within the valve-casing C′ the tapered valve

E is mounted so as to control the passages C^5 and C^6, which communicate with the inside of the brake-cylinder and with the liquid-supply pipe B^3, respectively. The valve E is forced upward into proper engagement with the casing by the spiral spring C^4, which is held in position by the plug C^2, screwed into the bottom of the valve-casing and having the central opening C^3. The valve E is a three-way valve having the following construction. There is one through-passage E^4, which is adapted to admit liquid from the passage C^6 to the passage C^5, communicating with the cylinder. At ninety degrees from this through-passage is formed the crooked passage E^5, as shown in Fig. 5, which is adapted to discharge the liquid from within the brake-cylinder and which communicates with the central axial passage E^2 in the valve, so that when the valve is in the position shown in Fig. 5 the liquid within the brake-cylinder passes through the passages C^5 E^5 and E^2 and C^3 and is thereupon discharged.

Upon the squared head E′ of the valve E there is rigidly secured the valve-arm F. The link F^3 is pivoted at F^2 to this valve-arm and is pivotally connected at its opposite end to the arm F^4 of the bell-crank lever. This lever is pivoted at F^6 to the frame of the motor-vehicle and its other arm F^5 is pivotally connected to the rod F^7. This rod carries at its front end the pivot F^8, which serves to connect it with the arm G^2 upon the brake-rod G, mounted in suitable bearings in an upright position. At the upper end of this brake-rod there is rigidly attached the brake-handle G′, which through the mechanism just described serves to control the position of the valve E as desired.

As shown in Fig. 6, the brake-rod G has near its top the bearing H′ in the bearing-support H, suitably attached to the body of the vehicle. Within the lower part of the bearing-block there is formed the square cavity H^2, which is symmetrical about the brake-rod and which is adapted to receive when the brake-rod is in such a position that the valve admits fluid to the brake-cylinder the squared extension G^6 of the locking-piece G^4. This locking-piece is slidably mounted on the brake-rod G, but is prevented from rotating with respect to it by the longitudinal grooves G^5, formed in the locking-piece, in which play the two ends of the pin G^3, passing through the brake-rod. This locking-piece is knurled upon its outer surface. The upper squared portion of this locking-piece has formed in one side of the same the cavity G^7, which is adapted to receive the catch H^8 when this locking-piece is thrust up within the cavity H^2. The catch H^8 is mounted in a small nipple H^3, screwed into the side of the bearing-piece, as shown, and is pressed forward toward the brake-rod by the small spiral spring H^9, which engages the collar H^7 upon the catch-rod H^5 and presses against the inner side of the cavity in the nipple. The pin H^6, which is driven through the catch-piece H^5, engages with a suitable groove in the inside of the nipple H^3, which serves to guide this catch-piece in its movement toward and from the brake-rod.

As will be seen by reference to Fig. 6, the catch-piece H^5, which is cylindrical at its outer end, fits within the nipple quite loosely, so that there is a considerable annular space between these two parts. The key K is adapted to fit in this space, and the cavity K′ serves to accommodate the catch-piece H^6, while the bayonet-slot K^3 is adapted to grasp the pin H^6, and thereby allow the catch to be withdrawn from the notch G^7 in the locking-piece.

As is shown in Fig. 8, the pins I^6 are driven into the brake-arms I^2 and are adapted to engage with projections K^5, formed upon the adjacent bearing-piece K^4, so as to stop the further rotation of the brake-arm in that direction. These two parts come into engagement when the brakes are withdrawn from the wheels under the action of the disengaging spring D^9, so that the brakes are positively locked by this means from further motion away from the wheels, and all the parts intermediate the arms I^2 and the brake-piston are held rigid under the tension of the disengaging spring D^9. This effectually prevents any shaking of the joints of the brake mechanism and obviates any noise from this cause.

The operation of my brake mechanism is as follows: In the normal operation of the steam motor-vehicle the steam will pass into the condenser-coil B′ and be condensed there, furnishing a supply of water for the brake mechanism under boiler-pressure. It will be noted that this condensed steam will be free from any impurities or dirt, so that a very good supply of fluid is obtained in this manner for the operation of the brake. The water being clean and pure is not likely to injure the brake-cylinder or valve. The supply of water furnished for the brake is automatically regulated, because the condensation of the steam will fill the worm nearly to the top and always maintain a sufficient supply of water for the operation of the brake. When it is desired to operate the brake, the brake-handle is turned to the position G^b. (Indicated in dotted lines in Fig. 2.) This throws the valve E to the position shown in Fig. 4, in which the passage E^4 allows the fluid to pass into the brake-cylinder, and thereby force the piston out to any desired extent, so as to operate the brakes and give any desired braking pressure upon the wheels A^3 through the connecting mechanism described. It will be noted in this connection that the equalizer-bar I^5 regulates the pressure of the brake-shoes upon the two wheels of the vehicle and secures a substantially equal pressure upon both, regardless of the exact position of the wheels relative to the body of the vehicle. When the brakes have been forced against the wheels with the de-

sired amount of pressure, they can be held in this position, so that this same braking action will continue by simply turning the brake-handle back to the position G'. (Shown in full lines in Fig. 2.) This moves the admission-passage E^4 out of line with the passages C^5 C^6, so that no more liquid can enter the brake-cylinder and none can escape therefrom. The piston is therefore held in the same position and the brakes can be kept applied with the same degree of force as long as this is desirable without any waste of the brake-actuating liquid. When it is desired to release the brakes, the brake-handle is turned to the position G^0. (Indicated in dotted lines in Fig. 2.) This moves the valve E into the position indicated in Fig. 5, so that the discharge-passage E^3 in the valve comes into alinement with the passage C^5 and allows the liquid in the cylinder to escape therefrom and out of the discharge-port C^3. When the valve is in this position, the releasing-spring D^9 throws the piston toward the rear end of the cylinder, and thereby forces the liquid out of this discharge-passage. It will be noted that the passage C^5, communicating with the interior of the cylinder, is formed at a considerable distance from the rear end of the same, so that as the piston nears the rear end of the cylinder this passage C^5 will be closed by the packing-ring D^5, and thereby a considerable amount of the liquid will be retained in this clearance-space. The leather packing-ring will therefore be kept continually moist and always adapted to operate properly.

It will be noted that the liquid discharged from the brake-cylinder will be comparatively cool and will escape into the air without any of the undesirable noise that is occasioned by the release of the ordinary air-brake and which would be very undesirable in the case of a motor-vehicle.

The locking device, which is adapted to operate when the brake is applied to its fullest extent, is intended to be used as a safety device to prevent the use of the motor-vehicle by persons other than the proper operator or to prevent its being stolen. When the valve is opened, so that the liquid is admitted to the cylinder to apply the brake, the handle is in the position G^5, so that the part G^6 of the locking member G^4 may be inserted into the cavity H^2, and the catch immediately engages it and prevents its withdrawal. The brakes are continuously applied under these conditions with the full pressure of the boiler, and it will be absolutely impossible for the motor-vehicle to be operated under these circumstances. The insertion of the key K serves to release the catch and allow the withdrawal of the locking-piece G^4, when the brake-handle can be moved so as to release the brakes and allow the normal operation of the vehicle. As indicated in Fig. 1, the locking member G^4 is arranged conveniently just under the seat of the operator, so as to be reached conveniently and yet not to interfere with the other parts of the vehicle.

Instead of the locking means I have shown for holding the brake-rod in position simpler means could be used. For instance, a pin connection could be used to hold this brake-rod against rotation in its bearing.

Having thus described my invention in this particular application of it, I set forth in the appended claims the exact scope of my invention.

Since parts of this invention could be used separately and since considerable variation could be made from the exact proportions of the parts as shown in the drawings, I do not wish to be limited to the exact form of my device disclosed, since many variations could be made in it by the ordinary mechanic.

I claim—

1. In a brake mechanism for motor-vehicles provided with a steam-boiler, a condenser-coil communicating with the boiler, brakes and a brake-operating piston actuated by fluid from said condenser-coil.

2. In a brake mechanism for motor-vehicles, a steam-boiler, a condenser-coil communicating with the steam-space of said boiler, a brake arranged to engage the wheel of said vehicle and a brake-operating piston arranged to be actuated by fluid from said condenser-coil.

3. In a brake mechanism for motor-vehicles provided with a steam-boiler, a condenser communicating with the steam-space of said boiler, a fluid-brake and means to actuate it by the fluid from said condenser.

4. In a brake mechanism for motor-vehicles having a steam-boiler, means to condense steam from said boiler, and thereby furnish a supply of water under pressure and a fluid-brake arranged to be actuated thereby.

5. In a brake mechanism for motor-vehicles, a supply of water under pressure, a fluid-pressure-actuating mechanism, a brake and a valve and connections therefor between said supply of water and said actuating mechanism, whereby a supply of water actuates the brake and is then discharged from the brake mechanism.

6. In a brake mechanism for motor-vehicles, a supply of liquid under pressure, a liquid-actuated brake, a brake-cylinder, a valve and connections therefor between said brake-cylinder and said supply of liquid to admit any desired amount of liquid to actuate the brake to any desired extent to hold said brake in operative position and to discharge said liquid from said brake mechanism.

7. In a brake mechanism for motor-vehicles, a supply of liquid under pressure, a liquid-actuated brake, brake-actuating means, a valve and connections therefor to admit liquid to said means and thereafter to discharge said liquid from said brake mechanism.

8. In a brake mechanism for a motor-vehicle, a supply of water under pressure, a brake, a brake-cylinder, a piston to operate said brake within said cylinder, a valve arranged to con-

trol the admission of said water to said cylinder and to allow its discharge from said brake mechanism.

9. In a brake mechanism for motor-vehicles, a brake-cylinder, a spring-pressed piston therein, brake-shoes operatively connected to said piston, a supply of liquid under pressure and a three-way valve between said supply of liquid and said cylinder, whereby said liquid may be admitted to said cylinder to apply the brakes or the liquid discharged from said brake mechanism under the action of said spring.

10. In a brake mechanism for motor-vehicles, a friction-brake to engage a moving part of said vehicle, brake-actuating means, a supply of liquid under pressure, a valve and connections therefor to admit such fluid to said actuating mechanism and to discharge said fluid from the vehicle.

11. In a brake mechanism for motor-vehicles, a source of fluid under pressure, a fluid-brake, a valve to admit such fluid to said brake and means to fasten said valve in this position to prevent the disengagement of said brake.

12. In a brake mechanism for motor-vehicles, a source of fluid under pressure, a fluid-brake, a valve to control the admission of said fluid to said brake and a lock arranged to maintain said valve in position to admit said fluid to said brake.

13. In a brake mechanism for motor-vehicles, a brake, a fluid-pressure mechanism adapted to operate said brake and means to lock said mechanism in such position as to secure the continuous operation of said brake.

14. In a brake mechanism for motor-vehicles, a supply of fluid under pressure, fluid-pressure brake mechanism operatively connected therewith, a brake-rod adapted to control the admission of such fluid to said brake, a slidable locking-piece on said brake-rod and means to hold said locking-piece against rotation.

15. In a brake mechanism for motor-vehicles, a brake, a brake-actuating mechanism therefor, a brake-rod to control said brake-actuating mechanism, a slidable locking-piece on said brake-rod, an abutment adjacent said locking-piece and adapted to coact therewith to hold said locking-piece against rotation, a spring-lock on said abutment and arranged to hold said locking-piece in engagement with said abutment and means to disengage said spring-lock.

16. In a brake mechanism for motor-vehicles, a brake, brake-actuating mechanism, a brake-rod arranged to control said brake-actuating mechanism, a stationary abutment adjacent said brake-rod, a sliding locking-piece on said brake-rod arranged to engage said abutment when said brake-rod is in position to operate said brake, a spring-latch adapted to hold said locking-piece in engagement with said abutment and a key to disengage said spring-latch from said locking-piece.

17. In a brake mechanism for motor-vehicles, a brake, a brake-arm suitably mounted and supporting said brake, a pin in said brake-arm, a coöperating stationary abutment, a spring and connections adapted to disengage said brake and bring said pin against said abutment so as to hold said connections rigid and prevent shaking.

18. In a brake mechanism for motor-vehicles, a pair of brake-arms pivotally mounted and carrying brakes thereon, means coacting with said brake-arms to prevent shaking when the brakes are released, an equalizer-bar loosely connected with said brake-arms, a brake-cylinder, a spring-pressed brake-piston within said cylinder connected to said equalizer with a pivotal connection and means to operate said piston by liquid-pressure.

19. In a brake mechanism for motor-vehicles, a pair of pivotally-mounted brake-arms, brake-shoes rigidly fastened thereon, an equalizer-bar loosely connected to said arms, a brake-cylinder, a spring-pressed piston therein, a piston-rod pivotally attached to said equalizer-bar, abutments adjacent said brake-arms and pins on said brake-arms, a supply of liquid under pressure to actuate said brake, a three-way valve arranged between said source of liquid-supply and said brake-cylinder and a locking device adapted to lock said valve in such position as to actuate said brakes.

20. In a brake mechanism for motor-vehicles, a friction-brake to engage a moving part of said vehicle, a brake-cylinder to actuate said brake, a supply of fluid under pressure, a valve and connections therefor to admit said fluid to said cylinder to actuate the brake, to maintain the brake in operative position and to discharge said fluid in said cylinder from the vehicle to release the brake.

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