

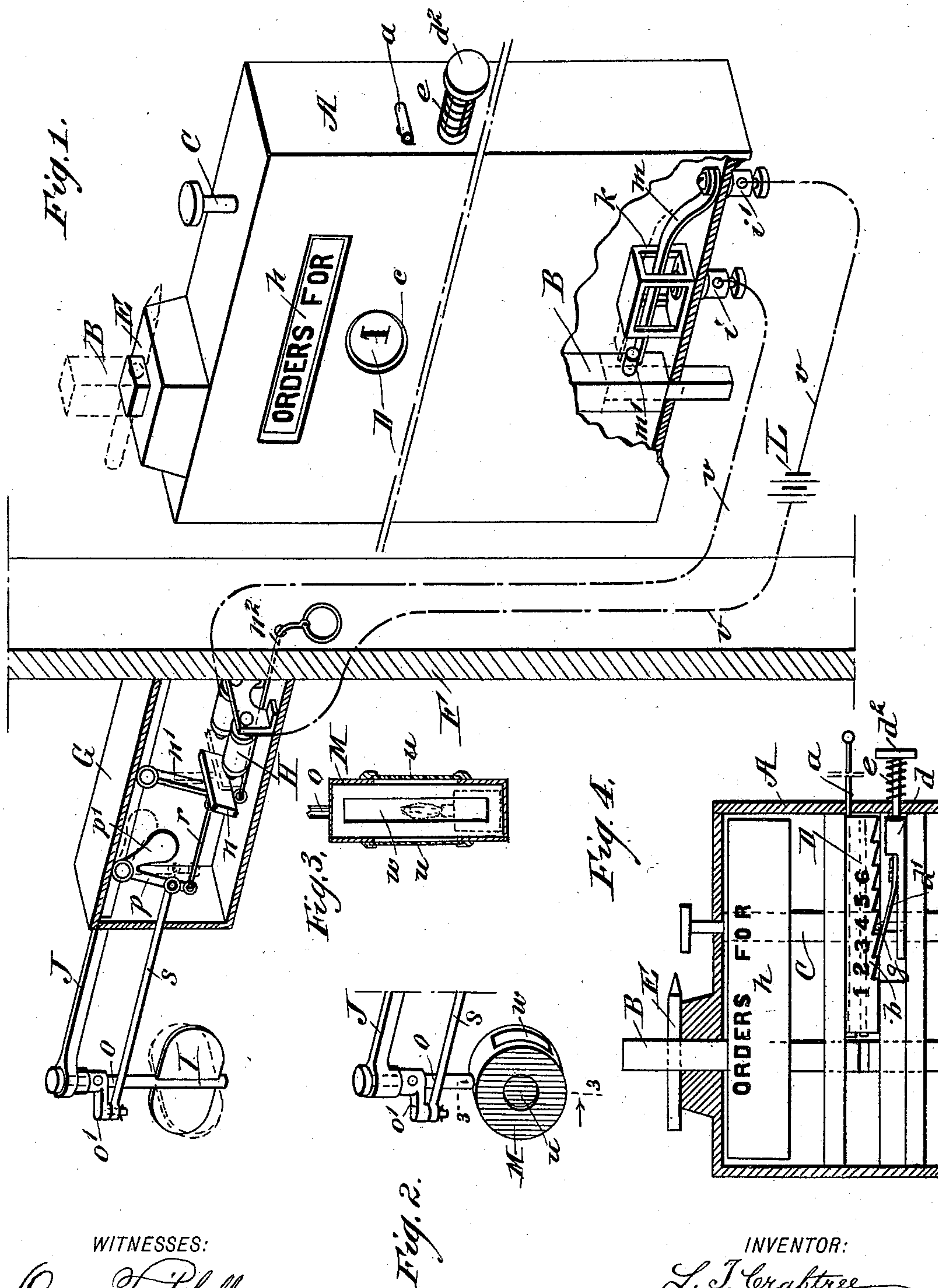
(No Model.)

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RAILWAY TRAIN ORDER AND SIGNALING DEVICE.

No. 491,837.

Patented Feb. 14, 1893.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

LEONARD T. CRABTREE, OF NEW LONDON, WISCONSIN.

## RAILWAY TRAIN ORDER AND SIGNALING DEVICE.

SPECIFICATION forming part of Letters Patent No. 491,837, dated February 14, 1893.

Application filed April 2, 1892. Serial No. 427,456. (No model.)

*To all whom it may concern:*

Be it known that I, LEONARD T. CRABTREE, of New London, in the county of Waupaca and State of Wisconsin, have invented a new and useful Railway Train Order and Signaling Device, of which the following is a full, clear, and exact description.

This invention relates to an improved signaling device co-operating with a train order annunciator, used on railroads employing the block system; and has for its object to provide a novel mechanism for setting and holding a semaphore or other visual signal over a railroad track at a way station, where orders are awaiting an approaching train. The train order annunciator placed in the way station office to indicate the train that is to receive orders, and co-acting with the exterior signaling device, being preferably similar to that patented by me March 10, 1891, No. 448,125.

A further object is to provide an improved signal in lieu of the ordinary device, which will reliably indicate "danger" or "safety" by day or night.

To these ends my invention consists in the construction and combination of parts, as is hereinafter described and claimed.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the views.

Figure 1 represents a train order recorder within an office, and broken away to show interior parts, and exterior of the office an attached visual signaling device, these being electrically connected and together embodying the improvement; Fig. 2 is a side view detached, of the improved visual signal; Fig. 3 is a transverse section of the device shown in Fig. 2, enlarged, taken on the line 3—3 in said figure; and Fig. 4 is a sectional view of the upper portion of the train order recorder shown in Fig. 1 at the right.

As in Patent No. 448,125, previously mentioned, there is shown a rectangular casing A, in which a gravity bar B is held to slide vertically, its fall being limited by a shoulder on its lower portion striking the lower wall of the case through which the reduced lower part of the bar slides, as indicated in Fig. 1. There is another slide bar C, loosely held in

the casing A parallel with the gravity bar B, and at a proper distance from it, preferably nearer the right side wall of the casing, which latter is perforated to permit a series of horizontal indicator slides D, to project their handle bars *a*, through the side of the casing convenient for manipulation when required, any proper number of the indicator slides being provided, one being shown.

The slides D, are supported in front of the bar C, and have each a series of ratchet teeth *b*, cut on the lower edge, and a corresponding series of numerals 1, 2, 3, &c., imprinted upon the side face that is outermost, these ordinals being suitably spaced apart so that by an endwise movement of any slide of the series, any desired number thereon may be exposed before a sight hole *c* in the front wall of the casing A.

Below each of the indicator slides D, a pusher bar *d*, is supported to move in a plane parallel with its respective slide, the bar having a detent plate spring *d'*, secured by one end to its top edge, the other end portion of the spring engaging with any one of the teeth *b*, it may be nearest to, while the resilience of the plate spring will cause its upward pressure upon the slope of the tooth it is opposite, and thus serve to retain the engaged slide from an improper endwise movement. The pusher bars *d*, extend through the case side wall as at *d*<sup>2</sup>, and each has a spring *e*, loosely mounted on its projecting portion in contact with the head of the bar and side of the case, so as to retract the pusher bar after each inward movement. Above each plate spring *d'*, a stud or pin *g*, projects from the bar C, so that a depression of the latter will enable the operator to slide and adjust properly any of the indicator slides D, to display the proper numeral before the sight hole in the case front as before explained.

The gravity bar B, is adapted to slide through the case A, at its top, and at a proper point from the upper end is transversely perforated to receive the style E, which is in pencil form such as is used to indite messages, or orders in the manifold copy book provided usually for writing a train order in duplicate as received by telegraph from the main office.

By insertion of the style E, in the elevated bar B, the vertical movement of the latter to



permit such a connection will remove a tablet *h*, from in front of a horizontal slot in the casing A; said tablet having the words "Orders for" affixed to its front face, so that  
 5 when the style is removed and the bar B, falls, it will carry with it the tablet that is attached thereto, and thus bring into view the notice for trainmen that they may expect orders, the number of trains and number of messages  
 10 awaiting it being displayed on the appropriate indicator slide simultaneously by a proper adjustment of the latter.

The parts and operation described are not a portion of the present invention, but have  
 15 been shown and explained to indicate their co-action with a novel signaling mechanism that is conjunctively used, whereby an approaching train may be stopped to receive important orders awaiting it, and that has  
 20 been posted on the office annunciator.

In Fig. 1, there are two binding posts *i*, *i'*, shown, that are connected with the lower wall of the casing A, and penetrate it. On the inner end of the post *i*, a skeleton rectangular  
 25 frame *k*, is affixed, having a top wall that is sufficiently removed from its bottom wall, so as to permit a plate spring *m*, to play between them a suitable distance, and when free from compression have forcible contact with the inner  
 30 surface of the frame top wall, as indicated by dotted lines in Fig. 1, this spring being held projected through opposite apertures in the ends of the frame *k*, by its fixed connection at one end with the other binding post *i'*.

From the adjacent side of the gravity bar B, a toe *m'*, projects sufficiently to impinge upon the end portion of the plate spring *m*, which extends through the frame *k*, so that the release of the gravity bar will impose its  
 40 weight upon the spring end and depress it, thereby opening the circuit. The frame *k*, spring *m*, and posts *i*, *i'*, are all made of material that is a good electrical conductor, so that if battery circuit wires are attached to  
 45 the posts named the contact of the spring with the top wall of the frame, will close the circuit.

Upon the upright structure F, that may represent the front wall of a way station tele-  
 50 graph office, a rectangular bracket frame G, is secured by one end, so as to project in a horizontal plane. Within the bracket frame an electro magnet H, is secured, so that its poles project outwardly, the magnet resting  
 55 in a plane parallel with the base of the bracket frame and near to it. At a proper point an armature *n*, is pivotally suspended from the top of the bracket frame G, by a pendulum bar *n'*, so as to hang opposite the poles of the  
 60 magnet H and be adapted to touch or recede from the same when vibrated. Forwardly of the bracket frame G, there is a visual signal blade I, pendently and rotatably supported, by a journaled engagement of the upper end  
 65 of its shaft *o*, with the perforated outer end portion of a horizontally projecting arm J, which latter is affixed to the frame G, so as

to extend outwardly toward a railway track, not shown, and conspicuously display the blade. As indicated in the drawings, the visual blade I, is secured to project equally on  
 70 each side of the pendent shaft *o*, with its sides in a vertical plane, and is thereby counter-balanced so as to permit it to be swung or rotated readily. Upon the shaft *o*, a swinging  
 75 arm *o'*, is secured to project at a right angle therefrom, and in a vertical plane at a right angle to that of the signal blade.

Within the bracket frame G, and forwardly of the armature *n*, a swinging bar *p*, is hung  
 80 by its upper end to the top of the frame, so that it may vibrate toward or from the armature, and from the side nearest the armature a weighty limb *p'*, is projected, which by its gravity will swing the bar *p* forwardly or to-  
 85 ward the pendent shaft *o*. There is a link rod *r*, of proper length provided which is loosely attached by its ends to the armature *n* and swinging bar *p*, and from the latter a connecting rod *s*, is forwardly extended and  
 90 loosely secured to the outer end of the arm *o'*. The length of the rod *s*, and link *r*, is relatively proportioned to the distance between the armature *n*, and bar *p*, and between said bar and the shaft *o*, so that when the  
 95 swinging bar is unrestrained, its weighty limb *p'*, will cause the bar to turn the visual blade I, into a position transversely of a railroad track to be guarded, and thus display a red or other colored danger signal which  
 100 the position and color of the sides of the blade will indicate.

Between the magnet H, and posts *i*, *i'*, the conductor wires *v*, are extended and connected, a local battery L, being introduced to fur-  
 105 nish current and energize the magnet when the circuit is closed.

If there are no orders, and the block is clear between way stations, the gravity bar B, is elevated and held in such a position by the  
 110 style E; this will close the circuit and render the magnet H, active. The armature *n*, is now drawn toward the poles of the magnet by a cord or wire *n'*, that is extended within the office for convenience. The force of the  
 115 magnet will retain the armature in connection with it as represented by dotted lines in Fig. 1, and the blade I, turned longitudinally over the track or near it parallel therewith, so that "safety" is indicated. 120

When the operator is signaled to take an order, he removes the style E, to copy the message in the record, and at the same time produce a formal order for the train approach-  
 125 ing the station. This will transfer the weight of the gravity bar B, to the spring *m*, depress it, and open the electric circuit that energizes the magnet H, which becoming inert releases the armature and other connected parts, whereby the visual blade will be automati-  
 130 cally turned across the track and indicate "danger."

In Figs. 2 and 3, there is shown the visual signal that is by preference used in connec-



tion with the other novel signaling mechanism adapted to automatically move it from "safety" to "danger." Said device consists of a cylindrical case or shell M, having parallel end walls that are centrally and circularly apertured and preferably glazed to cover the apertures, with red or other colored glass which will indicate "danger," as shown at *u*. The cylindrical shell has opposite slits cut in it, one being shown in said figures at *w*, consequently the slits and red glazed apertures are located at points ninety degrees distant from each other. The shell M, is suspended from the shaft *o*, so that the flat opposite sides will be held transversely of a track to be guarded, and the remaining surface of each flat side is colored to indicate "danger."

For night service a lamp is introduced within the shell M, as shown by dotted lines in Fig. 3, which when lighted will illuminate the red disks, and also throw a white light through plain or opal colored glazing that is placed over the slits *w*.

It will be seen, that when the wall of the shell M, is turned to align with the track below and expose the slits *w*, "safety" will be signaled thereby, and there will be no orders in the office for trains; but upon receipt of orders and the consequent removal of the style E, the red faces or illuminated disks *u* will be displayed, and trains in either direction of approach to the way station will be notified of danger or orders that have been received and are awaiting delivery in the telegraph office, the great difference in form as well as color of the disks and slits rendering mistakes impossible.

Having thus described my invention, I claim as new and desire to secure by Letters Patent,—

1. A train signaling device, comprising a suspended rotatable cylindric shell, having parallel side walls, circular apertures therein opposite each other, glazed disks on the shell, indicating "danger" by their color and form, and vertical glazed slots in the shell, located opposite each other and indicating "safety" by their color and form, substantially as described.

2. The combination with a train order annunciator provided with make and break device for an electric circuit, of a magnet connected with a battery and with the make and break device of the annunciator, a swinging armature, an oscillating signal, and means for connecting the signal with the armature and operating the said signal when the magnet becomes inert, substantially as described.

3. The combination, with the gravity bar of a train order annunciator made substantially as described, of a rotatable, pendent, visual signal, a supported magnet, a pendent armature, a make and break device for an electric circuit within the case of the annun-

ciator, which is actuated to open said circuit by the fall of the gravity bar, and circuit wires connecting the magnet with a battery and with the make and break device, substantially as described.

4. In a train order annunciator and signaling device combined, having a signaling device held to "safety" by electricity, a make and break device for an electric circuit, in the case of the annunciator, comprising a plate spring on one binding post that penetrates the bottom of the case, a skeleton frame on an adjacent binding post and through which the spring projects toward a gravity bar of the annunciator, a gravity bar that slides vertically when released and by impinging a projection therefrom upon the end of the plate spring breaks its connection, and battery circuit wires coupled with the binding posts, substantially as described.

5. In a train signaling device, the combination, with a pendent, rotatably-supported visual signal adapted to indicate "safety" or "danger" by partial rotation, a supported magnet, a pendent armature, a pivoted swinging bar having a laterally projected weighty limb, a link rod connecting the armature with the swing bar, a rod for manipulation of the armature toward the magnet, an arm on the signal-supporting shaft, and a connecting rod between said arm and the swinging bar, of a gravity bar in the annunciator case, having a lateral toe, a plate spring on the inner end of a binding post that penetrates the bottom of the case, a skeleton frame on another adjacent post similarly inserted, circuit wires between the posts and magnet, and a battery in the circuit, substantially as described.

6. The combination, with a bracket frame on a support, a magnet thereon, a pendent armature, means to manipulate and draw the armature toward the magnet, and a device to electrically energize the magnet when the signal is to be held to indicate "safety," of a train signal comprising a rotatable pendently-sustained cylindric shell having opposite colored glass disks in its sides, and white glazed oblong vertical slits in the shell, a weighted swinging bar on the bracket-frame between the signal and armature, a link between the bar and armature, and a connecting rod between an arm on the shell-supporting shaft and the weighted swinging bar, substantially as described.

7. The combination with a magnet and a pendent armature, of a signal mounted to oscillate, a pivoted bar having a weighted member, and rods connecting the said bar with the shaft of the signal and with the armature, substantially as described.

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Witnesses:

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