No. 819,327. PATENTED MAY 1, 1906.

M. M. VAN A. VAN WYCK.

CONTROL OF APPARATUS GOVERNING THE PASSAGE OF CARS OR VEHICLES ALONG A RAILWAY.

APPLICATION FILED NOV. 10, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

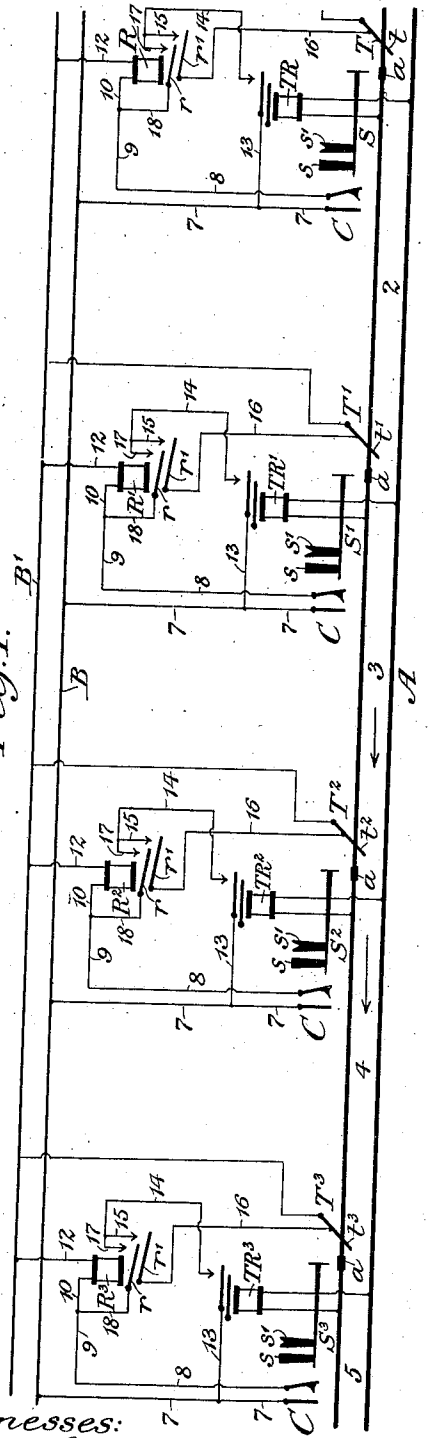
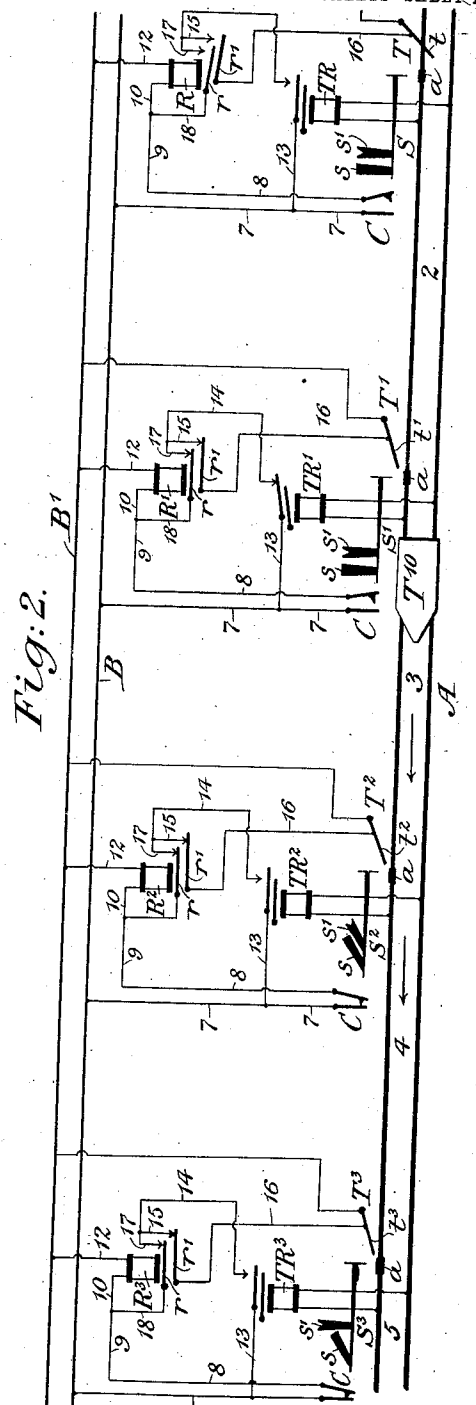


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

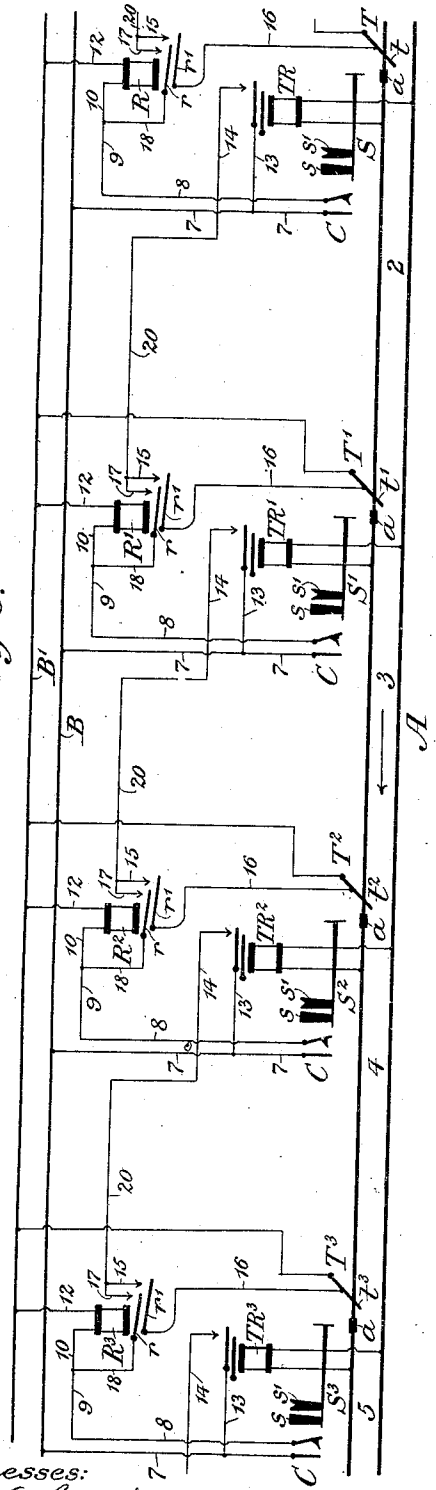
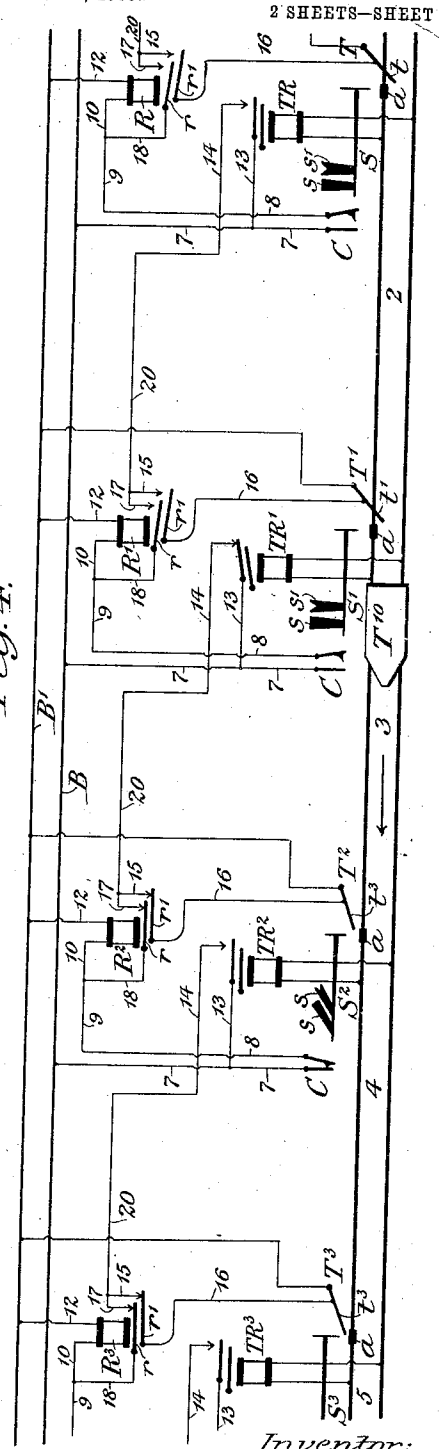


Fig. 4.



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UNITED STATES PATENT OFFICE.

MATTHIAS M. VAN ASCH VAN WYCK, OF NEW YORK, N. Y., ASSIGNOR TO THE UNION SWITCH AND SIGNAL COMPANY, OF SWISSVALE, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

CONTROL OF APPARATUS GOVERNING THE PASSAGE OF CARS OR VEHICLES ALONG A RAILWAY.

No. 819,327. Specification of Letters Patent. Patented May 1, 1906.

Application filed November 10, 1905. Serial No. 286,641.

To all whom it may concern:

Be it known that I, MATTHIAS M. VAN ASCH VAN WYCK, a subject of the Queen of the Netherlands, residing in the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in the Control of Apparatus Governing the Passage of Cars or Vehicles Along a Railway, of which the following is a specification.

My invention relates to the control of apparatus governing the passage of cars or vehicles along a railway.

My invention more particularly relates to the control of that form of apparatus generally known in the art as "train-stops." This apparatus is preferably automatic in its operation and comprises a trip which has at least two positions, one of which I will herein term its "operative" or "danger" position and the other of which its "inoperative" or "clear" position, a suitable form of motor for moving the trip from its operative to its inoperative position, and suitable means for controlling the supply of motive power to the motor. The trip is preferably moved to its operative position by gravity when power or energy employed to hold it in its inoperative position is cut off from the train-stop, though, if desired, suitable means may be employed for this purpose. The cutting off of the supply of power to the motor of the apparatus is generally through an electrically-operated device, and in this invention it is intended that when a circuit on a device is closed power will be supplied to move and hold the trip in its inoperative position and when the same circuit is opened such power will be cut off and the trip will move or be moved to its operative position.

I have not herein illustrated any specific form of train-stop, as my invention relates more particularly to the control of such apparatus, and therefore any form of such apparatus comprising the parts hereinbefore employed may be used. A function of the apparatus is to automatically set the brakes of a car or train or shut off the motor-power from the car or train motors, or both, should a car or train proceed past a "danger-point" without authority. This is generally accomplished by having the trip engage and operate an arm or arms carried by the car or train, which arm operates apparatus provided in the braking or power system of the train or otherwise affects such braking or power system. I have not herein illustrated any such arrangement on a car or train, as there are many and are well understood in the art.

I will now proceed to describe a system of control for such apparatus embodying my invention and will point out the novel features thereof in claims.

In the accompanying drawings, Figure 1 is a diagrammatical view of a portion of a railway, railway-signals located at points along the railway, a train-stop located at each signal-point, and a portion of an arrangement of circuits embodying my invention for controlling the operation of the train-stops. Fig. 2 is a view similar to Fig. 1, but illustrating a different condition of some of the circuits and parts due to the presence of a train. Fig. 3 is a view similar to Fig. 1, but illustrating a modification of the circuits of Fig. 1. Fig. 4 is a view similar to Fig. 3, but illustrating a different condition of some of the circuits and parts due to the presence of a train.

Similar letters of reference disignate corresponding parts in all of the figures.

A designates a portion of a railway which is divided into "block-sections" in a manner well known in the art. In the drawings I have shown one of the two traffic or running rails divided by insulation *a* to form the block-section, though, if desired, both of the traffic or running rails may be so divided. I have illustrated three block-sections 2, 3, and 4 and portions of two others, 1 and 5. At the entrance ends of the block-sections I locate, preferably, an automatic railway-signal of any approved semaphore type. S S', &c., designate such railway-signals. As shown, each railway-signal is provided with two semaphores, one, *s*, being a home signal and the other, *s'*, being a distant signal. This arrangement of the semaphores in a railway-signal is well-known in the art and need not be described. If desired, only one semaphore may be used at the entrance end of the block-section. The semaphores are shown as being usually in their position indicating "danger." I prefer to have the railway-signals automatically controlled by the passage of a train along the railway, and therefore any of the well-known railway signaling systems em-

ploying track-circuits and known as "normal danger systems" may be employed. These are so well known that I have not deemed it necessary to illustrate or describe any of them.

T, T', T², &c., designate train-stops, which are only diagrammatically illustrated. As hereinbefore stated, each comprises a trip or tripping-arm, a motor operatively connected with the trip, and a device to control the supply of motive power to the motor. A form of trip which may conveniently be used is illustrated in Fig. 19 of United States Patent No. 769,058, issued August 30, 1904, to J. P. Coleman, E being the motor connected with the trip, and C² the device to control the supply of motive power to the motor. In the drawings, *t t' t²*, &c., designate the trip or trip-arm.

The home semaphore *s* of each railway-signal is arranged to operate a circuit-controller C, which is embodied in the system of control for the train-stops. It may be of any desired type and construction. When the home semaphore *s* is in its danger position of indication, the circuit-controller is open, and when the home semaphore *s* is moved to its clear position of indication the circuit-controller is closed. The opening and closing of the circuit-controller is preferably effected by the semaphore in its movements.

B B' designate line-wires, one a feeder and the other a return, constituting a part of a circuit which also includes a suitable source of current. (Not shown.) These line-wires extend along the line of railway and supply current to the different devices and circuits comprised in the control system.

In this form of my invention the trips or trip-arms *t t' t²*, &c., usually stand in their operative or danger position—that is, in such position that they will engage and operate an arm or arms carried by the cars or trains to set the brakes or cut off the motive power or perform both functions. This may be said to be their usual position. This is an advantage in that no matter what disarrangement occurs in the signaling system, which might cause a false indication of a signal or signals or in the system of control for the train-stops, all trips will be in their operative position. As a train proceeds along the railway it successively, should traffic conditions warrant it, which traffic conditions are usually indicated by the positions of the semaphores, causes each trip in advance of it to be moved to its inoperative position, and when the rear of a train has passed a train-stop the trip thereof returns to its danger position, as will be hereinafter described. The railway-signals are also made to move to their clear position of indication, should traffic conditions warrant, as the train approaches and again to their danger position after a train has passed. Thus the positions of the semaphores and trips may be made to correspond.

Referring now particularly to Figs. 1 and 2, R R' R², &c., designate relays, one relay being provided for each train-stop. Each relay is provided with an armature, which when attracted abuts against what is generally termed two "front contacts." This construction of a relay is well understood in the art, the two contacts being in separate circuits, which are electrically independent of one another. In the drawings I have diagrammatically illustrated this arrangement for each relay by two armatures *r r'* and two contact-points. One of these contacts is included in two circuits for the train-stop, one of which I will hereinafter term a "main" train-stop circuit and the other of which I will hereinafter term a "supplemental" train-stop circuit. The other contact is included in a circuit (which I will hereinafter term a "supplemental" circuit) through the relay to keep it energized under certain conditions to hold the supplemental train-stop circuit closed. Also included in the supplemental train-stop circuit and the supplemental relay-circuit is the armature and back contact of a track-relay of the track-circuit for the block-section for which the train-stop is provided. TR TR' TR², &c., designate the track-relays.

Fig. 1 illustrates the usual condition of the circuits, railway-signals, the circuit-controllers, and the trip-arms of the train-stops—that is, they are in their operative position. The railway-signal S controls the entry of and passage of cars or trains along the block-section 2, the railway-signal S', the block-section 3, and so on. Train-stop T guards block-section 2, train-stop T' guards block-section 3, and so on. The main circuit for the relay for any one train-stop includes the circuit-controller on the railway-signal adjacent which the stop is located. Each such circuit may be traced as follows: starting from the line-wire B it is wire 7, circuit-controller C, wires 8 9 10, relay R R', &c., and wire 12 to line-wire B'. The main train-stop circuit for any train-stop includes the circuit-controller on the railway-signal adjacent which the stop is located. Each such circuit may be traced as follows: starting from the line-wire B it is wire 7, circuit-controller C, wires 8 9 18, armature *r* of relay R R', &c., wires 17 15, armature *r'* of relay R R', &c., wire 16, train-stop T T', &c., to ground or to the line-wire B'. Each supplemental relay-circuit may be traced as follows: starting from the line-wire B it is wires 7 13, armature of and back contact of track-relay TR TR', &c.; wires 14 17, armature *r* of relay R R', &c., wires 18 10, relay R R' &c., and wire 12 to the line-wire B. Each supplemental train-stop circuit may be traced as follows: starting from the line-wire B it is wires 7 13, armature and back contact of track-relay TR TR', &c., wires 14 15, armature *r'* of relay R

R′, &c., wire 16, and train-stop to ground or line-wire B′. It will thus be seen that all circuits (exclusive of the track-circuits) connected with any train stop or stops are open at one or more points, and as the circuits directly on the train-stops are open the trip-arms of all the train-stops will be in their operative position.

The operation of the system of control illustrated in Figs. 1 and 2 is as follows: As soon as a car or train enters a block-section, and I wish it understood that wherever I use the words "car" or "train" I mean a vehicle of any description traveling along the railway either as a unit or a train of two or more units, the track-relay for that block-section will be short-circuited and by dropping its armature will close signal-circuits (not shown) on the railway-signal which it is approaching, as well as the railway-signal next in advance, and thus have these railway-signals move their appropriate semaphores (should conditions warrant) to their clear position of indication. For example, in Fig. 1 assume a train in block-section 2 and approaching block-section 3. As soon as the train entered block-section 2 the track-relay thereof being short-circuited dropped its armature and closed a circuit or circuits on railway-signal S′ to have it move its semaphores to their clear position, as well as a circuit or circuits on railway-signal S^2 to have it move its home semaphore to its clear position, this operation of railway-signal S^2 being necessary before railway-signal S′ could operate to move its distant semaphore to its clear position. In other words, a train entering a block-section causes (should conditions warrant) two home and one distant semaphores in advance to be moved to their clear position. Also when a train completely enters a block-section all semaphores in the rear of the train are moved to their danger position. Of course this order of operation of the railway-signals may be varied to suit various conditions, all of which is well understood in the art. However, the clearing of a home semaphore or semaphores has a bearing on the present invention in that it closes the initial circuit in the system of control to have one or more trip-arms in advance moved to their clear or inoperative position. The condition of the railway-signals hereinbefore described is illustrated in Fig. 2. A train T^{10} is shown as being in block-section 3 and as advancing toward block-section 4. As soon as the train T^{10} entered block-section 3 it short-circuited the track-relay thereof and caused it to close signal-circuits on railway-signals S^2 S^3, as hereinbefore described, to have them move their home semaphores to their clear position, thereby closing their circuit-controllers C to close the main relay and train-stop circuits. As soon also as the train entered block-section 3 it caused the railway-signal S′ to have its semaphores move to their danger position, and thus opened the main relay and train-stop circuits, but at about the same time closed the supplemental relay and train-stop circuits by short-circuiting the track-relay TR′ to have it drop its armature onto its back contact. Thus the trip of train-stop T′ will be held in its clear or inoperative position until the train T moves completely out of block-section 3.

In Figs. 3 and 4 by the use of an additional wire 20 I am enabled to have the trip of a train-stop move to its danger or operative position so soon as a train has completely passed it—that is, with a normal danger system of signaling. The arrangement of the main relay and train-stop circuits is the same as in Figs. 1 and 2; but the supplemental relay and train-stop circuits are controlled by the track-relay preceding any train-stop. For example, the supplemental relay and train-stop circuits for the relay R′ and train-stop T′ are controlled from track-relay TR. A supplemental relay-circuit may be traced as follows: starting from line-wire B, it is wires 7 13, armature and back contact of a track-relay TR′, &c., wires 14 20 17, armature *r* of a relay R R′, &c., wires 18 10, relay R R′, &c., and wire 12 to line-wire B′. A supplemental train-stop circuit is the same as the above, except that from wire 20 it is wire 15, armature *r*′ of relay R R′, &c., wire 16, train-stop to ground or back to line-wire B′. With this arrangement as soon as a train completely leaves a block-section the track-relay of that block-section attracts its armature to open the supplemental relay and train-stop circuits, thus having the trip move to its danger or operative position behind a train.

In the arrangement shown in Figs. 3 and 4 what I have herein termed the "supplemental relay" and "train-stop" circuits may be employed to move and hold the trip of a train-stop in advance of a train in its clear or inoperative position. For example, (see Fig. 4,) the train T^{10} in block-section 3 by short-circuiting the track-relay TR′ closes the supplemental relay-circuit of relay T^2, which in picking up its armature closes the supplemental train-stop circuit at that point for train-stop T^2.

It will be understood, of course, that in the application of my invention to existing signaling systems many of the wires or conductors and apparatus used in such systems may be used in common with the wires or conductors and apparatus involved in my invention.

It will be seen, therefore, that my invention in its broadest aspect comprises a train-stop, the trip of which is usually in its operative position, and means affected by a train for first causing the train-stop to move its trip to its inoperative position and afterward or at a later period of time to again have the train-

stop move its trip to its operative position. In the preferred arrangement and viewed in its broadest aspect I provide a circuit for the train-stop which is usually open and close this circuit by means which are affected by a train. This is true of course only when the railway-signals give indications that the train may proceed along the several block-sections. The means for opening and closing the circuit may be a track-relay or a railway-signal acting upon a circuit including a relay (R R', &c.,) or equivalent device to open and close the circuit or both a relay and a railway-signal. In the preferred arrangement and viewed in an aspect slightly narrower than the aforesaid broad aspect I provide an open circuit for the train-stop which is opened and closed by a relay or other equivalent device, which relay or other device is included in a plurality of usually open circuits, both of which are closed either entirely simultaneously or at different periods of time by means (which may be either a track relay or relays or a railway-signal or railway-signals) affected by a train to have the train-stop move its trip to its inoperative position and opened by the same means simultaneously or one by the said same means at one period, at the other at a later period by the same or different means, which latter means are also affected by a or the same train.

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

1. In combination with railway-signals the semaphores of which are usually in their danger position of indication, a train-stop the trip of which is usually in its danger or operative position adjacent each railway-signal, an open circuit for each train-stop, and means affected by a train for closing said circuits to have the train-stop move its trip to its clear or inoperative position.

2. In combination with railway-signals, the semaphores of which are usually in their danger position, a train-stop adjacent such railway-signal the trip of which is usually in its operative position, and an open circuit for each train-stop, said circuit being arranged to be closed when a semaphore of a railway-signal gives a clear indication.

3. In combination with a block-section of a railway, a railway-signal for each block-section the home semaphore of which is usually at danger, a train-stop for said block-section the trip of which is usually in its danger or operative position, train-controlled means for automatically causing a train-stop to move its trip to its clear or inoperative position when an adjacent railway-signal moves its home semaphore to its clear position, and other train-controlled means for causing the train-stop to reset its trip in its operative position after the train has completely entered the block-section or passed beyond the block-section.

4. In combination with a block-section of a railway, a railway-signal for each block-section the home semaphore of which is usually in its danger position, a train-stop for said block-section the trip of which is usually in its danger or operative position, an open circuit for said train-stop, a device for closing said circuit controlled by a train, and means affected by a train to operate said device to have it open said circuit after it has passed the train-stop.

5. In combination with a block-section of a railway, a railway-signal therefor the home semaphore of which is usually in its danger position, a train-stop therefor, the trip of which is usually in its operative position, an open main circuit for said train-stop, a relay for opening and closing said main train-stop circuit, a main and supplemental circuit, both open, for said relay, the main circuit being closed when said semaphore moves to its clear position, and means affected by a train for closing said supplemental relay-circuit and at a later time for again opening said circuit.

6. In combination with a series of sections of a railway, railway-signals for controlling the passage of cars or trains along the sections, the semaphores of which are usually in their danger position, a series of train-stops, the trips of which are usually in their operative positions, and means actuated by a train traveling along the railway for successively causing one or more semaphores to move to their clear position, and one or more stops to their inoperative position and later to have the semaphores in its rear to move to their danger position and the stops to their operative position.

In testimony whereof I have signed my name to this specification in the presence of two subscribed witnesses.

M. M. VAN ASCH VAN WYCK.

Witnesses:

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