Dec. 30, 1952 G. C. TERRY 2,623,755

COLLAPSIBLE CARRIAGE

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Fig. 1

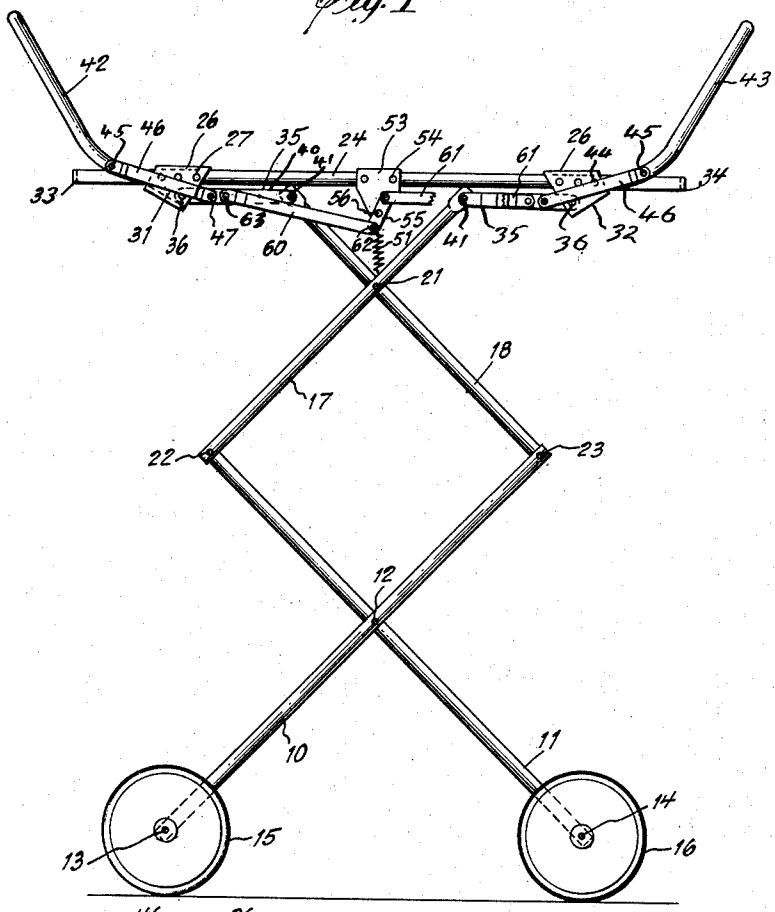
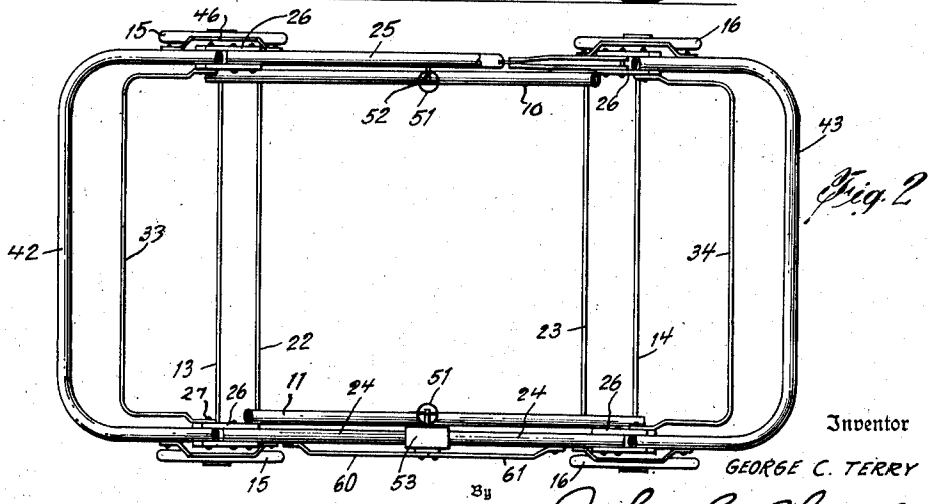


Fig. 2



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Fig. 3

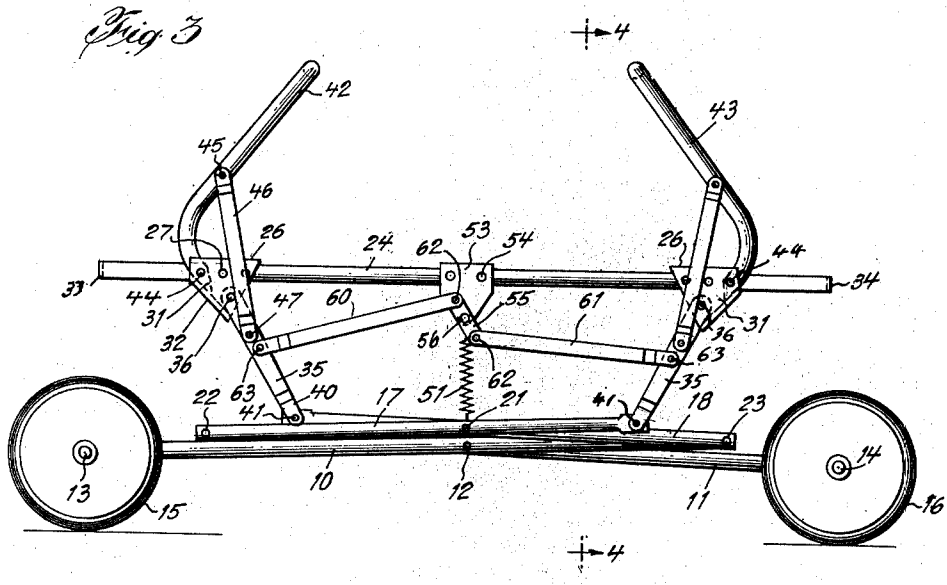
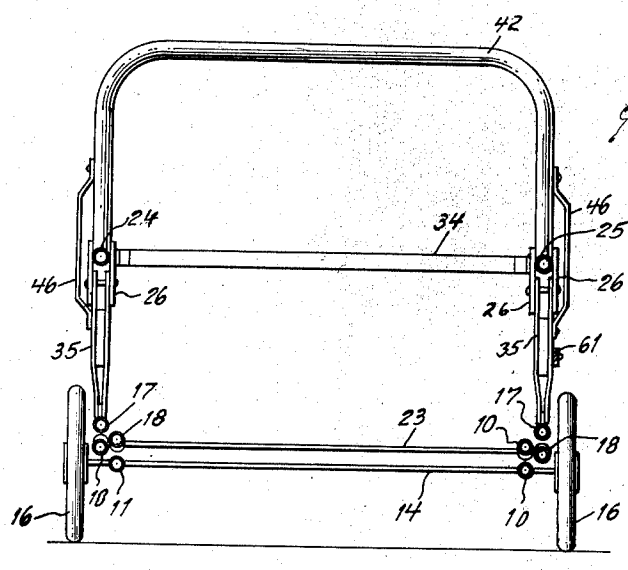


Fig. 4



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Fig. 5

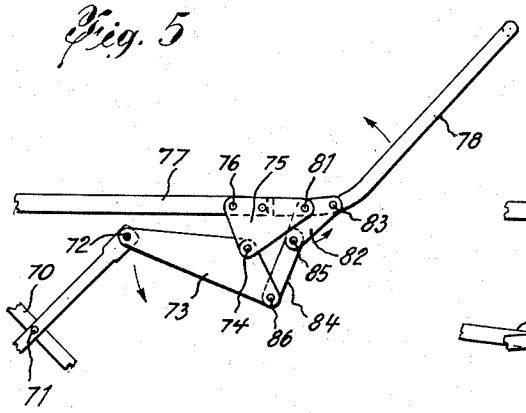


Fig. 6

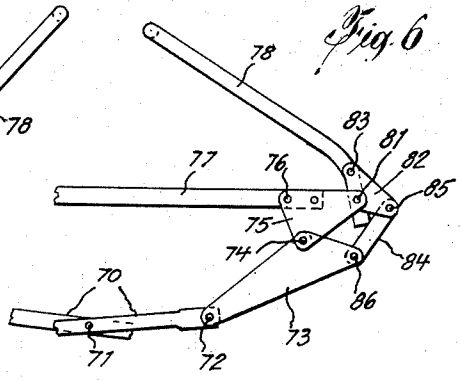


Fig. 7

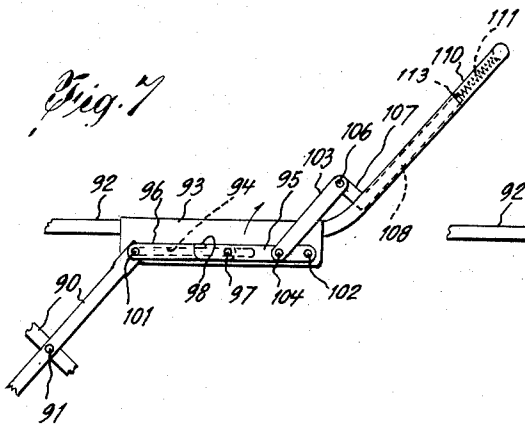
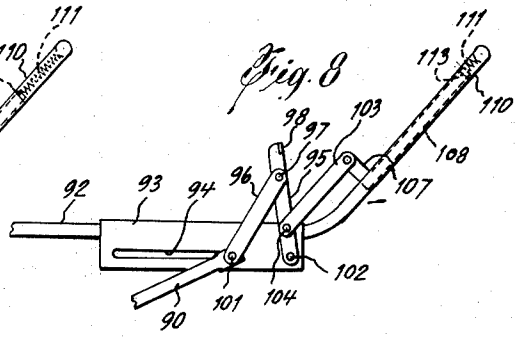


Fig. 8



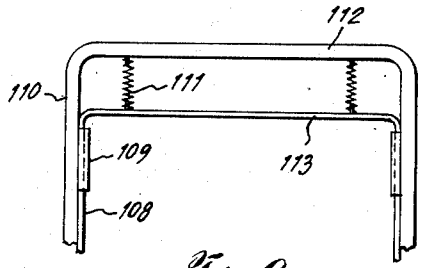


Fig. 9

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UNITED STATES PATENT OFFICE

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COLLAPSIBLE CARRIAGE

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Application August 25, 1951, Serial No. 243,608

9 Claims. (Cl. 280—41)

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This invention relates to new and useful improvements in collapsible carriages and relates more particularly to a novel mobile unit having an upper frame and supporting side walls of lazy-tong formation which give an approved measure of support to the upper frame and wherein the side walls are readily collapsible to folded position, whereby the unit may be stored while occupying a relatively small area.

An important object of the invention is to provide a novel foldable carriage for transporting laundry bags and other articles wherein the lazy tongs or scissors frames forming the side walls have a novel toggle-like connection with the upper frame which automatically positions itself in locked relation when the supporting structure is moved from collapsed to extended position and wherein the structure is readily collapsed by manipulating a simple lever associated with handle bars carried by the upper frame.

Another object of the invention is to provide a collapsible carriage comprising an under carriage which is movable from a collapsed to an extended position, and an upper frame, and links pivoted at the corner sections of the latter which form a toggle connection between the frame and the upper end of the undercarriage and which are readily movable from an above-center position when the undercarriage is in an extended position to a below-center position when the undercarriage is collapsed, the undercarriage including opposed side frames comprising centrally pivoted scissors bars which form lazy-tong structures.

A further object of the invention is to provide an improved structure of the character described having lazy tong side frames, and wherein novel spring means are utilized for moving the frames from fully extended to fully collapsed positions after the control members are moved to the center position. In a modified form of the invention the links at the upper ends of the side frames are in an above center position when the frame is collapsed.

No specific article carrying container is illustrated in connection with the upper frame since if the device is used for transporting laundry a simple canvas bag having spaced hooks may be employed, the hooks being attached to the frame. If the device is to be used as a carriage for groceries in a self-service store a basket may be suitably attached thereto.

In the drawings:

Fig. 1 is a side elevation of an embodiment of the present invention, the structure being shown in open or extended position;

Fig. 2 is a top plan view thereof;

Fig. 3 is a front elevation of the carriage in closed or collapsed position;

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Fig. 4 is a vertical section taken on line 4—4 of Fig. 3;

Fig. 5 is a broken side elevation showing a modified form of the invention with the parts in extended position;

Fig. 6 is a similar view showing the parts in collapsed position;

Fig. 7 is a broken side elevation showing another modified form of the invention;

Fig. 8 shows the same structure in collapsed position;

Fig. 9 is a broken end elevation of the handle bar arrangement.

Referring now more particularly to the drawings, the undercarriage includes lower, tubular frame members 10 and 11 centrally pivoted together at 12. These frame members are essentially scissors bars and one set of these members is disposed on each side of the carriage. At their lower ends the front and rear frame members are joined by horizontal rods or axles 13 and 14, at the opposed terminals of which rubber-tired wheels 15 and 16 are freely journalled.

The undercarriage further includes upper tubular frame members or scissors bars 17 and 18 pivotally joined together somewhat above their centers at 21. At their lower ends the latter frame members are pivoted to the upper ends of bars 10 and 11 by horizontal rods 22 and 23 extending transversely of the rear of the structure. This lazy-tong arrangement on each side of the undercarriage gives appropriate and rigid support to the upper structure which includes front and rear spaced tubular frame members 24 and 25 which are provided at opposite ends thereof with generally U-shaped sheet metal brackets 26 which are secured thereto by rivets 27.

The side plates 31 of the brackets are generally triangular in shape, the upper edges thereof being substantially parallel with upper frame members 24—25 and the lower connecting walls 32 are diagonally inclined, downwardly and inwardly. The upper frame members are maintained in their spaced relation by means of substantially U-shaped end frames 33 and 34 which are secured by means of the rivets 27 directly to the inner vertical walls of the brackets 26.

At the lower, inner extremity of each bracket 26 a channel-shaped link 35 formed of sheet metal is pivotally secured at 36 and extends inwardly of the upper frame from brackets 26 toward the center of the frame structure. This link is of substantially U-shape in transverse section and at its inner extremity 40 it is somewhat narrower than at its outer extremity and a pivot pin 41 joins this inner extremity with the upper extremity of each of upper frame members 17 and 18. Substantially U-shaped handle bars 42

and 43 extending transversely of the upper frame are pivotally secured at 44 at the outer terminals of brackets 26. Also secured at 45 to each leg of each handle bar 42 and 43 is a lever 46 whose lower extremity is pivotally secured at 47 to link 35.

At each side of the frame structure a spring 51 is secured at its lower end to pivot pin 21 and at its upper end it is secured to frame members 24 and 25 at 52.

A substantially triangular bracket 53 is secured at 54 centrally of horizontal frame member 24. A short link 55 is pivoted at 56 at the lower end of bracket 53 and at the opposite ends of said link, links 60 and 61 are pivotally secured at their inner ends at 62. The outer ends of links 60 and 61 are pivoted at 63 to links 35.

When the undercarriage is in its extended position links 35 and the upper terminals of scissors bars 17—18 underlie horizontal frame members 24—25, the latter acting as stops limiting upward movement of both members. The weight of the upper frame alone and especially of the articles supported thereby prevents any dislocation of the parts or collapsing of the scissors bars.

When, however, the undercarriage is to be moved to collapsed position the handle bars 42—43 are raised upwardly, thus causing links 35 to be moved downwardly. When pivots 47 pass below a center line defined by pivots 21 and 36 the undercarriage is free to collapse.

Whereas each of the handle bars is to a large extent free to move independently of the other, their conjoint movement is desirable to collapse the structure, and this conjoint movement is aided considerably by levers 60—61 and their interconnected link 55.

When the undercarriage is in fully extended position and the handle bars are manually moved toward each other, the upper farme starts to rise due to the action of levers 46 tending to push links 35 downwardly. This rising action of the upper frame places tension on springs 51 and as soon as links 35 get slightly past a position of alignment with scissors bars 17—18 links 35 are free to collapse because pivots 47 have passed below the center line defined by pivots 21 and 36. The springs which at this moment are under considerable tension take over the collapsing motion and quickly drop the parts to the position of Fig. 3.

Similarly, when the undercarriage is raised, springs 51 are again placed under tension and when central pivots 47 pass above the center line of pivots 21 and 36 the upper frame snaps into fully raised position.

The upper frame defined by members 24, 25, 33 and 34 may be used to support any desired article such as a laundry basket having hooks for attachment to the frame.

In the modified form of the invention shown in Figs. 5 and 6 the upper scissors bars 70 are centrally pivoted at 71 and at their upper ends they are pivoted at 72 to a triangular plate or lever 73 which is pivoted at 74 to a plate 75 secured at 76 to upper frame 77. The handle bar 78 is pivoted at 81 to plate 75.

A second triangular plate 82 is also pivoted at 81 to the upper frame and at 83 to the handle bar. The link 84 is pivoted at 85 to plate 82 and at 86 to plate 73. Fig. 5 shows the relation of the parts when the end structure is in extended position. When it is desired to collapse the latter, the handle bars are moved in the direction of the arrows which cause links 84 to draw the outer end of plate 73 upwardly and its lower end downwardly, thereby permitting the scissors bars to collapse.

In the second modified form of the invention shown in Figs. 7, 8 and 9 the upper scissors bars 90 are pivoted together at 91 and the upper frame 92 carries a plate 93 having a horizontal slot 94. Elbow links 95 and 96 are pivoted together at 97 and a stop 98 on the former limits downward movement of the two members to a position just slightly below center. A pin 101 connects frame member 90 with slot 94 and with link 96. The other link 95 is pivoted at 102 on plate 93. A link 103 is pivoted at 104 on link 95 and at its opposite end it is pivoted at 106 to an offset portion 107 carried by a U-shaped bar 108 mounted in slideways 109 on handle bar 110. Springs 111 urge the U-shaped bar away from the transverse portion 112 of the handle bar. When the parts are in extended position the portions of elbow links 95 and 96 are slightly below center as shown in Fig. 7. When however the transverse portion 113 of the U-shaped member 108 is moved toward bar 112 the link 103 causes lever 95 to raise upwardly while thus permitting the outer end of each frame 90 to move outwardly in slot 94, and allowing the structure to collapse. The first form of the invention is illustrated as being provided with wheels at its lower end but it will be appreciated that any of the foregoing structures can be employed in connection with a non-mobile unit.

While three forms or embodiments of the invention have been shown and described herein for illustrative purposes, and the construction and arrangement incidental to three specific applications thereof have been disclosed and discussed in detail, it is to be understood that the invention is limited neither to the mere details or relative arrangement of parts, nor to its specific embodiments shown herein, but that extensive deviations from the illustrated forms or embodiments of the invention may be made without departing from the principles thereof.

I claim:

1. A collapsible supporting structure of the class described comprising an under structure which is movable from a collapsed to an extended position, and an upper frame, inwardly extending links pivoted at the corner sections of the frame on the lower surface thereof and forming a toggle connection between the frame and the upper end of the under structure and which are movable from an above-center position when the latter is extended to a below-center position when it is collapsed, the lower surface of the frame acting as a stop for limiting upward movement of the links, and means for producing substantially conjoint movement of the links in their travel from above center to below center positions and comprising a short link centrally pivoted substantially midway of the upper frame on one side thereof, and third links pivotally connected at one end thereof at the outer ends of the short link and at their other ends between the ends of the first links, the under structure including opposed side frames comprising centrally pivoted scissors bars.

2. A collapsible supporting structure of the class described comprising an under structure which is movable from a collapsed to an extended position, and an upper frame, inwardly extending links pivoted at the corner sections of the latter forming a toggle connection between the frame and the upper end of the under structure and which are movable from an above-center posi-

tion when the latter is extended to a below-center position when it is collapsed, and stop means limiting upward movement of the links, the under structure including opposed side frames comprising centrally pivoted scissors bars, bars pivoted at opposite ends of the frame and levers connecting said bars with said links to manipulate the latter from their upper to their lower positions.

3. A collapsible carriage of the class described comprising an under carriage which is movable from a collapsed to an extended position, and an upper frame, links pivoted at the corner sections of the latter forming a toggle connection between the frame and the upper end of the under carriage and which are movable from an above-center position when the under carriage is in an extended position to a below-center position when the under carriage is collapsed, a second set of links pivoted to the first set of links and which are manually manipulable to depress the inner ends of the first set of links to move them from the above-center position to the below-center position, the under carriage including opposed side frames comprising plural sets of centrally pivoted, interconnected scissors bars which form lazy-tong structures, and wheels journalled at the lower end of the under carriage.

4. A collapsible carriage of the class described comprising an undercarriage which is movable from a collapsed to an extended position, and an upper frame, links pivoted at the corner sections of the latter forming a toggle connection between the frame and the upper end of the undercarriage and which are movable from an above-center position when the undercarriage is in an extended position to a below-center position when the undercarriage is collapsed, the undercarriage including opposed side frames comprising plural sets of centrally pivoted, interconnected scissors bars which form lazy-tong structures, and wheels journalled at the lower end of the undercarriage, handle bars pivoted at opposite ends of the frame and levers connecting the bars with the links to manipulate them from their upper to their lower positions.

5. A collapsible carriage of the class described comprising an undercarriage which is movable from a collapsed to an extended position, and a generally rectangular upper frame, inwardly extending links pivoted at the corner sections of the latter forming a toggle connection between the frame and the upper end of the undercarriage and which are movable from the extended position where they contact the underside of the frame, which acts as a stop, to a lowered position when the undercarriage is collapsed, the undercarriage including opposed side frames comprising centrally pivoted scissors bars which form lazy-tong structures, axles mounted at the lower ends of the frames and wheels carried on said axles, handle bars pivotally carried at each end of the upper frame, and levers connecting the handle bars with the links intermediate their ends to lower the links to collapse the scissors bars.

6. A collapsible carriage of the class described comprising an undercarriage which is movable from a collapsed to an extended position, and a generally rectangular upper frame, a bracket mounted at each corner section of the latter, an inwardly extending link pivoted on each bracket and forming toggle connections between the frame and the upper end of the undercarriage, said links being movable from an upper position where they contact the underside of the frame, which acts as a stop, to a lowered position when

the undercarriage is collapsed, the undercarriage including opposed side frames comprising plural sets of centrally pivoted, interconnected scissors bars which form lazy-tong structures, a spring connecting at least one upper pivot with the upper frame, axles mounted at the lower ends of the frames and wheels carried on said axles, handle bars pivotally carried at each end of the upper frame, and levers connecting the handle bars with the links intermediate their ends to lower the links to collapse the scissors bars.

7. A collapsible structure of the class described comprising an under carriage which is movable from a collapsed to an extended position, and an upper frame, levers pivoted intermediate their ends at the corner sections of the latter forming a toggle connection between the frame and the upper end of the undercarriage and which are movable from an above-center position, when the under carriage is in an extended position, to a below-center position when the under carriage is collapsed, the under carriage including opposed side frames comprising plural sets of centrally pivoted, interconnected scissors bars which form lazy-tong structures, a handle bar pivoted at each end of the upper frame and links connecting the latter with the outer ends of the levers to move the inner ends of the levers downwardly as the handle bars are moved, so as to collapse the side frames.

8. A collapsible structure of the class described comprising an undercarriage which is movable from a collapsed to an extended position, and an upper frame having longitudinal slots at the corners thereof, pins slidably connecting the upper ends of the under carriage with said slots, interconnected elbow links pivoted to said upper ends and to said frame at the corner sections of the latter and forming a toggle connection between the frame and the upper end of the undercarriage and which are movable from a below center to a raised position above center when the undercarriage is collapsed, the under carriage including opposed side frames comprising plural sets of centrally pivoted, interconnected scissors bars which form lazy-tong structures.

9. A collapsible supporting structure of the class described comprising an under structure which is movable from a collapsed to an extended position, and an upper frame, links pivoted at their outer ends at the corner sections of the frame, said links extending inwardly and being pivotally connected at their inner ends to the under structure and forming a toggle connection between the frame and said under structure, said links being movable from an above-center position when the latter is extended to a below-center position when it is collapsed, and stop means limiting upward movement of the links, the under structure including opposed side frames comprising plural sets of centrally pivoted interconnected scissors bars forming lazy-tong structures, and wheels at the lower ends of the side frames.

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