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(54) **Tent with frame.**

(57) Collapsible tent (1 to 10, 71, 711 to 716) with inner tent (21, 27, 29, 40731 to 736) stressed by elastic frame (11 to 20, 70, 721 to 726) by means of bands (105 to 114; 116 to 121; 838) or strings (100 to 104).

Rods (183; 198; 239, 240; 275, 276; 299, 300) heavily loaded next lateral forks (177, 217, 219, 220; 801, 802; 841, 842) are stronger. Sag of outer rear wall (390) is avoided by rear thicker rods (192, 193, 194), less bent.

Frames (11 to 20, 70) either separated in front pole (161 to 170) and two diagonal poles (151 to 160) above with two stops (188) for top snap hooks (123) of main bands (105, 106) from inner tent (21, 27, 29, 30).

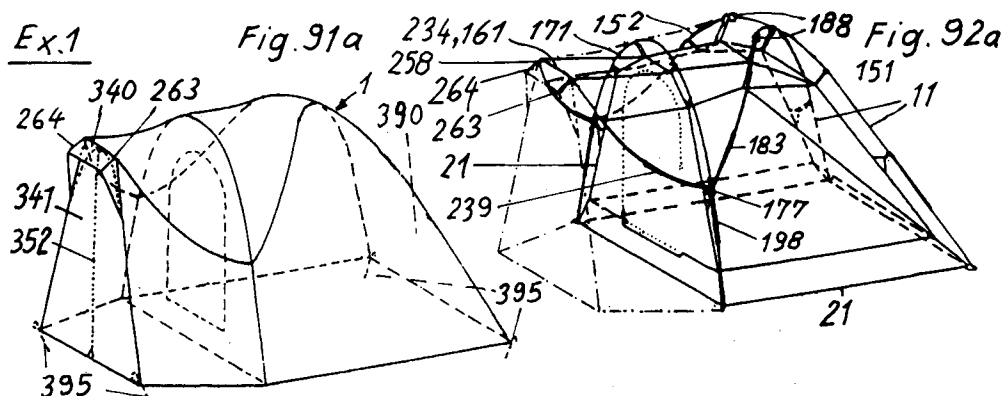
Or for broad tents (711 to 716), the frame (721 to 726) is separated in a ring-pole (811, 843, 844, 895, 936), in the top with crossing-piece (834) or

crossing-rod (834, 870); and in rear poles (815, 816). Or said ring-pole (810, 936) is only present in the beginning of mounting operation, before separated in front pole (861, 911) and angular pole (862, 912), for open tents (905, 946) with separate front tent (885, 926).

Front projecting range (234) respective front pole (161 to 170, 861, 911) straight with angle piece(s) (257, 258; 305), cross rod (251), or curved rod (283). Special frames (11, 12, 13; 713, 715, 716) with middle pole (171, 913) respectively second frame (173).

Tents (1, 7, 7SP, 8, 9, 10; 711, 712, 713) with front roof (340, 356) held by frame (11, 17, 19, 20, 70; 721, 722, 723) over front ventilation (353, 354, 360). Tents (2, 3, 8, 715, 716) with detachable front tent (42, 43, 48; 885, 926).

Tent (1 to 10, 71, 711 to 716) in car (960).

**EP 0 683 292 A1**

## TECHNICAL FIELD

This invention relates to a collapsible tent with frame, inner tent and at least one cover tent, especially for a small number of people,

**at which** said inner tent and said at least partially elastic frame is so performed and detachable connected with each other, that they are stressed against one another,

**and said frame** consists at least of two lateral forks, at these adjacent a front projecting range oblique front above, at said lateral forks adjacent each a front top section oblique to the rear above, at that adjacent each a rear top section, and at that adjacent each a rear lower section, and at said lateral forks adjacent each a front lower section, the latter consisting at least of one rod; at which the lateral forks are provided with at least each two joinings,

**and whose inner tent** is preferably provided with a tent bottom with at least four below corners,

**and whose cover tent** lies on the frame which is arched at least partially.

## BACKGROUND OF THE INVENTION

Such tents are known as igloo tents or dome tents. They have the **advantage** of free interior and to be insensible to wind despite of the light construction as a result of their arched shape and the elastic frame. Their poles are composed of short rods by means of plug-joinings and elastic. These rods consists especially of aluminium or glass fibre. The poles are below provided with pins, which are placed in holes of flaps at the corners of the tent bottom, when the tent is erected.

Most of the tent of this sort offered on the market are having a small height, so that a person cannot stand inside upright. Therefore, their **disadvantage** is, that they are **uncomfortable** for longer use.

It is known, to get a large height of the tent by means of a large tent bottom in usual construction of the diagonal poles. But the disadvantage is the big weight of the complete tent as the result of its large tent bottom, the latter not required for one person, a pair or three people.

The following publications are known to this and considered subsequently:

In the British patent specification 1033820 (first date 17.Oct.62), there is already a frame with forks shown in fig. 2 with some joinings above.

In the German patent application 3820725 of 18.June 88, whose inventor I am (but there not mentioned), in fig. 67 a similar frame of an igloo tent is shown in mounted condition. Its parts are shown there in the figs. 68, 69, 70 and 71. As shown, the diagonal range is separate from the

lower section with the fork. Thus these three parts form there **no** united pole. Also in my European patent application 0401398 of 6.June 89, the **separate** fork with the lower section can be seen in the figs. 92 and 93. This separation was necessary in my both former patent applications to enable the mounting operation.

Compared with usual low igloo tents as well as the previously mentioned igloo tent in both patent applications originate from my own, the **following problems** exist in usual high, thus comfortable igloo tents:

**Problem 1A:** During the mounting operation, the inner tent and the frame are stressed against one another. Hereby the relative high frame is being overloaded, because the connection to the inner tent is firstly done with all force at one spot. Also the lower section of the frame is strongly loaded in case of wrong motions. Besides this, at the erected tend, said lower section has to transfer different outer forces, made by wind, from the top via the lateral forks to the ground.

In the publications mentioned at the beginning, the poles are shown with rods of equal diameter. Consequently the danger exists, that very high strains arises in the rods near the forks and consequently these will there brake. An enlargement of the thickness of all rods corresponding to the manifestation of this publications but would reduce the necessary elasticity of the frame and result much increasing of its weight. Both facts are not desired.

**Problem 1B:** As the result of the arched shape of usual inner tents, its inner entry is small, thus uncomfortable. A large comfortable inner entry needs a large plan front area of the inner tent.

**Problem 1C:** At any high tent, the walls of the cover tent are more bent than at any low tent. This is a big disadvantage at the rear wall of the cover tent, especially when it is wider than the lateral walls. Because the rear wall of the cover tent lies only on the frame, it cannot be stretched horizontally. But it is stretched vertically by means of the tent nails. Hereby and by its own weight results in consequence of the bigger bending a sag of the cover tent and also a disturbing touch with the inner tent.

As to be seen sometimes in practice at erected usual tents, the rear top and lower sections of the usual continuous thin diagonal poles has not the desired exact position under the rear edge of the cover tent, thus under its seam. In this case, the cover tent does not look well as the result of the indifferent position of the rear sections of said diagonal poles.

**Problem 2A:** For the reason of the larger height, the diagonal poles are having a large length of about 5.5 metres for example, in an igloo tent for 3 people. With usual design, said very long poles

have to be shoved into the loops of the inner tent. A disadvantage is the time consumption for this.

Because at the beginning of mounting operation the straight diagonal poles firstly lie on the earth bottom in angle to each other, their space required for the mounting is very large at a usual tent. Consequently, on a tight occupied camping ground, its mounting operation may be difficult or impossible.

**Problem 2B:** During the course of mounting operation, already the diagonal poles, middle pole and inner tent are being mounted. Now the front pole is attached in one fork, then in the second fork. The putting in the first fork is simple, because the front pole is yet freely movable. For putting into the second fork, it and the front pole must be bent by hand in this way, that the free end of the latter is in alignment with the front joining of the fork. Then they have to be put one in another under load. If at this spot only the usual small play of a plug-joining exists corresponding to the manifestation of the mentioned publications, it is difficult, to feel the specific position, in which this play exists. Then the front pole is jamming in the fork and can be pushed in only with difficulty. (But during the later disassembly operation of the tent, fork and front pole are very difficulty to separate, because then the specific position, in which this small play exists, is nearly not to feel in the erected condition.)

**Problem 2C:** As a result of the stronger bending at a high tent in the areas of the inner tent and the walls of the cover tent, the danger increases, that they get in contact, whereby any penetrating of water is possible during rain. Therefore, and also for the circulation of cooling air, their distance should be larger. For that reason it is practical, to replace the mostly used loops by bands. These allow a larger distance, without any disadvantage by their weight.

Therefore, long bands are better for several reasons. But long bands have to be adjusted on the frame after mounting operation by hand, because actual the correspondence is missing between the length of the pole and the stretched length of the edge of the inner tent.

**Problem 3:** Large high tents for four or more people need a stronger broad frame for the broad tent bottom. Consequently the following problems result:

**Problem 3A:** For a stronger frame, any connection of the frame's sections in the top is better for the stability of the frame.

**Problem 3B:** A stronger broad frame needs more hand power for the mounting operation. Therefore, it should have a special shape for easy mounting.

**Problem 3C:** By the broad inner tent for more people, the rear wall of the cover tent is also broad. Therefore, the structure of the frame should give any possibility for this circumstance. (As lately specified in sub claim 12.)

## SUMMARY OF THE INVENTION

**Object 1** of the present invention is to create a light high tent with a frame, whose structure near the lateral forks is of equal resistance, stretching the inner tent; the latter having sufficient distance to the cover tent, so that both ones cannot touch, to avoid any penetrating of water under rain, or under hot weather, cooling air can circulate; in preferred embodiment withan about plane rear wall of the cover tent and an exact shape of its rear edges.

**Object 2** of the present invention is to create a high tent with a frame separated in several poles for easy mounting, whose front pole can be attached or detached in preferred embodiment by a single person, thus without any jamming of the front pole hereby; with exact positions of the bands on the frame.

**Object 3** of the present invention is to create a broad high tent with a strong frame, which is easily mountable in spite of its large size, in preferred embodiment by a single person.

The invention seeks - in the previously **mentioned objects 1 to 3** - to create tents with frame in which at least in anteroom or interior at least one person can stand upright (besides an example of a small tent for one person or perhaps two people).

The invention, as characterized in **claim 1**, **solves the object** concerning problem 1, **that the inner tent** is provided with a plane front area with at least an inner entry, and in front above with at least one front top corner, the latter with at least one front top string or band directed to the front, which is connected especially by means of hooks directly or indirectly with the front projecting range of the frame,

**and the frame** is composed of several rods with different strengths, which are detachably connected by means of plug-joinings or by any different manner, at which the rods beside the lateral forks have a larger strength than the most different rods, **at which** in preferred embodiment also the rods in the rear lower section have a larger strength than the most different rods.

"Stronger" don't mean here in each case "thicker". There may exist also rods with same diameter, but from different materials, thus therefore different strength. For example steel and aluminium, or aluminium and glass fibre.

The invention, as characterized in **claim 2**, **solves the object** concerning problem 2,

that the frame, in the collapsed condition of the tent,

is separated in a front pole consisting of the front projecting range;

and separate from it two diagonal poles each composed of a lateral fork, a front lower section, a front top section, a rear top section and a rear lower section; at which the poles each are hold inside together especially by means of stressing elastic,

at which the front joining of each lateral fork has a larger clearance than the different plug-joinings,

and said both diagonal poles are provided before their crossing point C with at least each a stop, which may be performed as a ball-joint,

and the inner tent is above provided with at least a front top corner or two centre top corners with two main-bands, which are hung by means of top snap hooks or different connection parts in the diagonal poles before their stops, and said inner tent is also provided with at least two rear top corners with two rear top bands, which are hung by means of rear snap hooks or different connection parts in the diagonal poles behind their crossing point C.

The invention, as characterized in claim 3, solves the object concerning problem 3,

that in the beginning of mounting operation of the tent a ring-pole exists,

in which is present in the shape of a ring at least the front projecting range,

both lateral forks,

both front top sections,

and a crossing-piece with at least four joinings, or five joinings, which may be connected by means of a centre cross rod, so that a crossing-rod exists, perhaps with six joinings;

and the inner tent in preferred embodiment is provided with at least a top centre corner and a centre band or two main bands, which are hung by means of hooks or different connection parts in eyes at the crossing-piece or at the crossing-rod, or beside them at the frame; and further top strings and especially hooks are present between inner tent and frame.

The advantages gained by the invention are essentially as follows:

#### According to claim 1:

Advantage by solution of problem 1A: In the course of mounting operation, the frame and the inner tent are already being mounted. But the latter is not yet connected with the front projecting range (in claim 2 namend front pole, because then separated). Now the front projecting range (respective the front pole) is pushed in longitudinal direction back by one hand, and simultaneously one front

string (of more strings) is caught by the other hand and drawn forward till its hook can be hung in the front pole. To enable this, the front pole is pushed strongly backwards by hand beyond its normal position. And because at first only one string is being hung in one-sided, the total force acts only about one lateral fork. In consequence of the pushing back and the one-sided stress, abnormal large forces (more exactly bending torque) act at the rods next said lateral forks. Said rods bear these forces, because they are stronger. (The stronger rod under said lateral fork is able also to transmit different large forces from the top to the ground when the tent is completely mounted, caused by any storm.) Now the other front bands are hung in the front pole.

The use of different thick pipes of aluminium for the rods gives no increasing of costs, perhaps a small decrease of the expenses are resulting: First, in the concerning diameters, the thicker pipes are cheaper than the thinner diameters, because the latter are difficulty to manufacture. Second, a plug-joining between rods of different diameters is simpler to manufacture than a plug-joining between rods of equal diameter.

Advantage by solution of problem 1B: The inner tent is created especially with a front plane area which can be stretched better than usual arched tents, and which is rigidly stretched in all directions by means of bands or strings at the corners of the inner tent. Said large front plane area of the inner tent allows a large comfortable inner entry.

Advantage by solution of problem 1C: By a preferred embodiment is gained, that the rear wall of the cover tent is nearly plane in its middle and below part, only above it is arched. Therefore, any disturbing sag by bending is avoided and hence the penetration of any water.

And also by said preferred embodiment, an additional advantage is the exact position of the diagonal poles in the sewed rear corner-edges of the cover tent also by their stronger rods in the rear lower sections.

#### According to claim 2:

Advantage by solution of problem 2A: At the beginning of mounting operation of the tent, only the rods of the long diagonal poles need to be put one in another on the length of the tent bottom. Therefore, only small space is required for the mounting operation. (The rest of said rods is lately connected when the diagonal poles are completely mounted.)

Advantage by solution of problem 2B: During the following course of mounting operation, the snap hooks of the inner tent are hung into the

diagonal poles. (Attention has only to be paid that both upper snap hooks of the main bands are fastened with any distance before the stops, but the other snap hooks behind them.)

The diagonal poles, (as well as middle pole, if present) and inner tent are already being mounted. Now the front pole is firstly stuck without any load into one fork and then stressed in cross direction. It is bent by one hand and the other fork is bent by the other hand, till they can be shoved one into another. This is **under load** possible by the well feeling **large clearance** between the **front pole** and the **lateral forks**. (This way, also the later detaching of the front pole is possible.)

Now the front pole is attached. Inner tent and frame are now erected and stand without any connection by means of tent nails stroked in the ground. Then the cover tent is put over the frame. The cover tent is hung in the eyes of four flaps at the below corners of the inner tent. The tent can be fastened by tent nails on the earth ground. The complete mounting operation can be done by a single person alone.

The disassembly of the tent is done about inversely as described. For **disassembly under rain**, the snap hooks or hooks permit to hang off firstly the inner tent which remains dry. The cover tent and the frame are collapsed finally.

Advantage by solution of problem **2C**: Because, as the result of the action of the stops, the bands can be performed in long shape, sufficient distance exists between inner tent and cover tent with all the advantages resulting of it concerning air circulation as well as protection against water.

### According to claim 3:

Advantage by solution of problem **3A**: The four top sections of the frame are connected by means of a crossing-piece or a crossing-rod. Consequently the frame is stronger.

Said frame gets its shape under the four top sections mainly by itself. Consequently the bands can be performed in long shape, because not essential for the shape of the frame. Therefore, sufficient distance is present between inner tent and cover tent with all the advantages.

Advantage by solution of problem **3B**: Because the front projecting range and the below and top front sections are (at the beginning of the mounting operation) performed as a ring-pole, the latter can completely be stressed in cross direction easily by hand.

More exactly, in the beginning of mounting, the tent bottom is fixed at the ground by means of tent nails. The ring-pole lies over it. Its behind front lower section is fixed at the behind front corner of the tent bottom by means of pin in hole. Now the

before front lower section is pushed inside, so that the ring-pole is stressed in cross direction. Then the before front lower section is fixed at the frame also by means of pin in hole.

By this way of mounting, the front projecting range and the front top sections are stressed together in an easy way. Consequently also one single person is well able to mount a large frame. (By this mounting, it disappears the sole cross stressing operation of the front pole, here not present in separate shape.)

Advantage by solution of problem **3C**: The crossing-piece or the top forks of crossing-rod result an easy possibility for the attaching of any additional rear poles as mentioned in sub claim 12.

The **sub claims** give further advantages as subsequently mentioned:

By sub claim **4** result several tents with long and high size, with an about vertical high inner entry of the inner tent. Said inner entry can be opened in different positions by its semicircle upper part.

In preferred embodiment, the front ends of the diagonal poles are secured against any loosening by mistake during the mounting operation. As the result of this, one single person is able to mount alone the tent.

By sub claim **5** result several tents which can be used **either** under nice and warm weather in the open condition without any front tent, **or** under cold weather with the front tent, at which the zipper for its attaching is used as outer entry at both sides. The erected open tent (thus without any front tent) is alone self-supporting, so that it can easily be moved inside the camping area to a better spot.

Said open tent can be closed:

**Either** closed by a long high front tent (from the following sub claim 6).

**Or** closed by a short front tent at said tents having a especially a curved middle rod in the front pole. The latter is in this way less stressed by bending when mounted, in spite of the relative thick diameters of its rods.

By sub claim **6** results a very long tent with large high anteroom, easily mountable.

One tent can be used in two different conditions: Without or with the long front tent.

From sub claim **7** result light tents with inner tents, easily mountable due to its small size and reduced number of strings. But with high anteroom in the tent with full stand-height (besides ex. 10). The cover tent is also supported by the inside front strings.

By sub claim **8** result frames easily mountable because the front pole is less bent by hand for its attaching. Also with lower bending and tension of the diagonal poles. In spite of these advantages,

each frame is provided with equal diagonal poles which cannot be changed by any mistake during the mounting operation.

By sub claim 9 result some self-stressing frames which can very easily be mounted, well be done also by one single woman. Some if said frames also with lower bending and tension of the diagonal poles.

(For the beginning of mounting operation: The diagonal poles are here symmetric, thus different. Therefore, attention has be paid to their right position.)

By sub claim 10 results a frame, whose lateral forks cannot be mounted in any wrong position, because permanently present in their right position in the ring-pole.

By sub claim 11 results a broad tent with separate detachable front tent, because the separate front pole can be mounted in the loop of the "open cover tent". But front pole and angular pole are connected like a ring with each other at the beginning of the erection of the tent. Thus for easy mounting, especially when the front pole is separated in two half poles.

Said tent can by used **either** under nice and warm weather in the open condition without any front tent, **or** under cold weather with front tent.

By sub claim 12 result several broad tents with a strong back area of the cover tent, because supported by the additional one or two back poles. The back area of the tent has a shape like an apse, thus with lower sensibility against storm.

By sub claim 13 result two conditions for one tent:

**Either** with a self-supporting front roof without any disturbing strings in front of tent, at which said front roof protects the variable front ventilation against any rain, fully opened under warm weather.

In the concerned tents with about vertical front area of the cover tent, the outer entry is well protected by said front roof also when its vertical zipper is opened.

**Or** in front below with a completely opened cover tent under hot weather. Said tent is self-supporting in this condition, so that the erected tent can easily be moved inside the camping area to a better spot.

By sub claim 14 results a variable rear ventilation protecting the inner tent against any rain when opened, which can be closed partially or nearly completely.

By sub claim 15 results a car transporting a tent which don't need any space used for different luggage.

## BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described by way of several examples and with reference to the accompanying drawings in which:

The figures with a number without any small letter are shown approximately in scale 1:100.

More accurate figures with a number having a small letter "a" about in scale 1:50.

Figures with "b" in big size about in scale 1:30.

Figures with "c" show the poles collapsed for transport.

Figures as well as details with "d" about in scale 1:3.

Figures in any extraordinary scale are having a small letter "e".

Figures with "k" show the component parts of the knocked down pole during the manufacturing.

The diameters of the rods in the poles are largely drawn in order to show their differences.

Figs. 1 to 9 are perspective views of several tents in accordance with the invention. The numbers of examples in parentheses are similar the figures here shown.

Fig. 10 shows the open tents of the figs. 2, 3 and 6, thus without any front tent.

Figs. 11 to 14 are perspective views of the inner tents imagined in erected position, belonging to the tents shown in the same column, and

Figs. 15 to 18 show their front sides.

Figs. 19 to 26 show some tents of the figs. 1 to 9 in longitudinal sections.

Figs. 27 to 30 show longitudinal sections of the inner tents along the lines A-A, B-B, C-C and D-D of the figs. 35 to 38.

Figs. 31 to 34 show side views of said inner tents imagined in erected position, belonging to the tents shown in the same column, also in the figs. 1 to 10, and

Figs. 35 to 38 their top views.

### Example 1

Fig. 39b is a perspective view illustrating the erected frame with inner tent in accordance with the invention, belonging to the tents shown in fig. 1 and subsequently in fig. 92a (in smaller scale).

Figs. 40d to 46d show the enlarged details E, F, G, H, I, J and K of fig. 39b.

Fig. 47d is a view in direction of the arrow L in fig. 41d.

Fig. 48d is a view in direction of the arrow M and N on the figs. 44d and 45d.

Figs. 49b and 50b show both lateral front rods.

Fig. 51d is one of them in different scale, at its right in section.

Fig. 52b shows the front pole when mounted, and

Fig. 52c when collapsed for transport, and

Fig. 52k when knocked down in its component parts (during the manufacturing), each part shown in section.

Fig. 53d shows an enlarged detail O of fig. 52k and is the middle rod of the front pole, in the left in view, and in the right in section.

Figs. 54d and 55d show sections along the lines P-P and Q-Q of fig. 53d.

Figs. 56d and 57d show the plugs in both ends of the front pole, the last one in section along the line R-R of fig. 56d, and

Fig. 58d is an enlarged detail T of both ends of said front pole, with the small outer diameter "s".

Fig. 59b shows one of both equal or symmetric diagonal poles of example 1 when mounted, in straight condition, and

Fig. 59c when collapsed for transport, and

Fig. 59k when knocked down, of all its component parts (during manufacturing).

Fig. 60d is an enlarged detail U of fig. 59k and shows the lateral fork of the diagonal pole in view, which is connected with the below rod, and

Fig. 61d in section, with the large diameter I inside its front hole.

Fig. 62d shows an enlarged detail V of fig. 59b as views belonging to each other, and

Fig. 63d the plug in it.

Fig. 64d shows an enlarged detail W of fig. 59b, and

Fig. 65d the plug in it.

Fig. 66d shows an enlarged detail X of fig. 59b and is the stop as double ball-joint, and

Fig. 67e its stop respective ball-joint in about full scale (1:1) in section along the line Y-Y of fig. 66d, (illustrated with the largest possible angle).

Fig. 68b shows the middle pole when mounted and

Fig. 68c when collapsed for transport, and

Fig. 68k when knocked down in its component parts (during the manufacturing), and

Figs. 69d and 70d the enlarged plugs in its ends, the last one in section along the line Z-Z of fig. 69d.

Figs. 71b and 72b are a side view and a top view illustrating the erected frame with inner tent (as shown in fig. 39b in perspective view) with the cover tent shown in dash-dotted lines, with the crossing point C of the diagonal poles, and Fig. 72e a partial view of fig. 72b in the direction of the arrow A (scale about 1:6).

Fig. 73a a front view of fig. 71b without any front pole, shown in different scale.

Fig. 74d shows an enlarged partial section through the front pole along the line B-B of fig. 71b, and

Fig. 75d its right half as a view.

Fig. 76d and 77d show sections along the lines D-D of the figs. 74d and 75d, without or with the lateral front rod.

Fig. 78d shows an enlarged detail E of fig. 71b in section with the visible large clearance between the lateral fork and the front pole, thus between the different diameters s and I, visible in the figs. 58d and 61d.

Fig. 79d shows an enlarged detail F of fig. 71b.

Fig. 80e shows an enlarged detail G of fig. 72b (scale about 1:6), and

Fig. 81e an enlarged section along the line H-H of fig. 72b and more exactly along the lines H-H-H-H of fig. 80e.

Figs. 82 to 90 show the course of mounting operation.

#### Examples 1, 2 and 3

Fig. 91a is a perspective view illustrating the tent of the example 1 (as shown in fig. 1 in smaller scale) in accordance with the invention, similar fig. 39b and the here following fig. 92a which are now shown with the cover tent. (The open inner entry is illustrated in dashed lines here and in the following tents.)

In the examples subsequently described, any details are only shown if different from example 1.

Fig. 92a shows the inner tent and the frame of fig. 91a (as in fig. 39b illustrated in larger scale), with the cover tent in dash-dotted lines.

Figs. 93a and 94a are perspective views illustrating the tents with the front tents of the examples 2 and 3 (as shown in the figs. 2 and 3 in smaller scale) in accordance with the invention, and

Figs. 95a and 96a their inner tents and frames, in the last figure the separate second frame in dash-dotted lines, and

Fig. 97e shows their true connection between frame and inner tent by eyes at the cover tent, in the enlarged details I and J (scale about 1:6) of the figs. 95a and 96a.

Fig. 98e shows an enlarged detail K of fig. 96a (scale about 1:6), and

Fig. 99d an enlarged section along the line L-L of fig. 98e.

Figs. 100a and 101a show the inner tent of the examples 1, 2 and 3 imagined in erected position, without (when half-ready manufactured) or with the connection parts.

Figs. 102d to 106d show the enlarged details M, N, O, P and Q of fig. 101a.

Figs. 107a and 108a show the diagonal pole and the middle pole from the figs. 52b to 70d here used in example 1 as well as in the examples 2 and 3; said diagonal pole in angular condition by the action of the ball-joint.

Figs. 109a and 110a, 111a show the front pole and both lateral front rods from the figs. 49b to 58d used for example 1.

Figs. 112a, 112b, 112c and 112k show the front pole of example 2.

Fig. 113a is a perspective view illustrating the open tent of example 2, thus without any front tent in accordance with the invention (as shown in fig. 10 in smaller scale).

Fig. 114e shows an enlarged detail S and T of the figs. 113a and 121a (scale about 1:6)

Fig. 115a shows a section along the line U-U of the figs. 113a and 121a.

Figs. 116a, 116b, 116c and 116k show the front pole of example 3.

Fig. 117d shows an enlarged detail V of fig. 116k

Figs. 118d and 119d show its side view and a section along the line W-W of fig. 117d, and

Fig. 120d a section X-X of fig. 119d.

Fig. 121a is a perspective view illustrating the open tent of example 3, thus without any front tent in accordance with the invention (similar as shown in fig. 10 in smaller scale).

Figs. 122a, 122b, 122c and 122k show the second frame of example 3, the last one with all its component parts.

Figs. 123a and 123b show the top views of the figs. 122a and 122b.

Fig. 124d shows an enlarged detail A of fig. 123b, and

Fig. 125d its side view.

Fig. 126d shows a section along the lines B-B of the figs. 124d and 127d, and

Fig. 127d a section along the line C-C of fig. 126d.

Fig. 128d shows an enlarged detail D of fig. 123b, and

Fig. 129d the plug in it.

#### Examples 4, 5 and 6

Fig. 130a shows the diagonal poles the of examples 4, 5 or 6, straight performed similar fig. 147b. (The rod in detail I is enlarged illustrated in fig. 148d.

Figs. 131, 132 and 133 are perspective views illustrating the tents of the examples 4, 5 and 6 in accordance with the invention.

#### Examples 7, 7SP and 8

Figs. 134a, 135a and 136a are perspective views illustrating the tents of the examples 7, 7SP and 8 (as shown in the figs. 4, 5 and 6 in smaller scale) in accordance with the invention, and

Figs. 137a, 138a and 139a their inner tents and frames.

Fig. 140e shows an enlarged detail E of fig. 139a (scale about 1:6), which is the true connection between frame and inner tent.

Figs. 141a and 142a show the inner tent of the examples 7, 7SP and 8 imagined in erected position, without (when half-ready manufactured) or with the connection parts.

Figs. 143d, 144d and 145d show the enlarged details F, G and H of fig. 142a.

Fig. 146a shows the front top part of fig. 142a in also possible arrangement for example 5.

Figs. 147a, 147b, 147c and 147k show one of both diagonal poles of the examples 7, 7SP and 8.

Fig. 148d shows an enlarged detail I of the figs. 130a and 147c and is the rod with the stop, and Fig. 148e its stop in about full scale (1:1) in section along the line J-J of fig. 148d.

Fig. 149d is an enlarged detail K of fig. 147k and shows the lateral fork of the diagonal pole in view, and

Fig. 150d in section.

Fig. 151a, 151b, 151c and 151k show the front pole of example 7.

Fig. 152d shows its enlarged middle rod, and

Fig. 153d a section along its lines L-L.

Figs. 154a, 154b as well as 155a and 155b show both lateral front rods of example 7.

Figs. 156a, 156b, 156c and 156k show the front pole of example 7SP.

Fig. 157d shows an enlarged detail M of fig. 156k.

Figs. 158d and 159d show a side view and a section along the line N-N of fig. 157d, and

Fig. 160d a section O-O of fig. 159d.

Figs. 161a and 161b show the middle front rod of the example 7SP.

Figs. 162a, 162b, 162c and 162k show the front pole of example 6.

Fig. 163a is a perspective view illustrating the tent of example 8 without any front tent in accordance with the invention (as similar shown in fig. 10 in smaller scale).

Fig. 164a shows a section along the line P-P of fig. 163a.

## Example 9

Fig. 165a is a perspective view illustrating the tent of the example 9 (as shown in fig. 7 in smaller scale) in accordance with the invention, and

Fig. 166a its inner tent and frame.

Figs. 167a and 168a show its inner tent imagined in erected position, without (thus half-ready) or with the connection parts.

Figs. 169d and 170d show the enlarged details Q and R of fig. 168a.

Figs. 171a, 171b, 171c and 171k show one of both diagonal poles.

Fig. 172d shows an enlarged detail S of fig. 171k and is the rod with the stop.

Fig. 173d is an enlarged detail T of fig. 171k and shows the lateral fork of the diagonal pole in view, and

Fig. 174d in section.

Fig. 175a, 175b, 175c and 175k show the front pole.

Fig. 176d shows its enlarged middle rod, and

Fig. 177d a section along its lines U-U.

Figs. 178a, 178b as well as 179a and 179b show both front rods.

## Example 10

Fig. 180a is a perspective view illustrating the tent of example 10 especially for only two peoples (as shown in fig. 8 in smaller scale) in accordance with the invention, and

Fig. 181a its inner tent and frame.

Figs. 182a and 183a show its inner tent imagined in erected position, without (thus half-ready) or with the connection parts.

Figs. 184d and 185d show the enlarged details V and W of Fig. 168a.

Figs. 186a, 186b, 186c and 186k show one of both diagonal poles.

Fig. 187d shows an enlarged detail X of fig. 186k and is the rod with the stop.

Fig. 188d is an enlarged detail Y of fig. 186k and shows the lateral fork of the diagonal pole in view, and

Fig. 189d in section.

Fig. 190d shows an enlarged detail Z of fig. 186b, and

Fig. 191d the plug in it, which is now a differently performed.

Fig. 192a, 192b, 192c and 192k show the front pole.

Fig. 193d shows its enlarged middle rod, and

Fig. 194d its section A-A.

Figs. 195a, 195b as well as 196a and 196b show both front rods.

## Positions of Tents

Figs. 197 to 201 show the tent of example 1 or similar 4, 13 in several positions: With open front ventilation; front entry half open, full open; front roof down; or cover tent tied back.

Figs. 202, 203 and 204 show the tent of example 2 or 5 (or similar example 8) in several positions (with open inner entry): Front entry half open, full open; or without any front tent.

Figs. 205, 206 and 207 show the tent of the examples 3 or 6, which are also valid for the examples 15 and 16.

Figs. 208 to 212 show the tent of example 7 (or similar 8, 9, 10, 11).

Figs. 213 to 217 show the tent of the examples 7SP or 11SP.

Figs. 218 and 219 show a front view on the inner tent of the examples 1, 2, 3, 4, 5, 6 or similar 11, 12, 13 with the inner entry half open or full open.

Fig. 220 shows a front view of the inner tent of the examples 7 or similar 8, 9, 10 with the inner entry full open.

Figs. 221a, 222a and 223a show the figs. 197, 208 and 213 with front below tied back cover tent in larger scale, and with open inner entry.

Figs. 224 to 231 show the tents of the examples 1 to 10 in side views, and

Figs. 232 to 239 in top views, and

Figs. 240 to 247 in section along the lines B-B, C-C, D-D, E-E or F-F of the figs. 224 to 231.

## Front Ventilation

Figs. 248a, 249a and 250a show the tents of different examples in longitudinal sections along the lines G-G, H-H and I-I of the figs. 254a, 255a and 256a, with open front ventilation, and

Figs. 251a, 252a and 253a in perspective views (as already shown in the figs. 197, 208 and 213 in smaller scale), and

Figs. 254a, 255a and 256a in front views.

## Rear Ventilation

Fig. 257a shows a top view of the tent of example 1 (similar 2, 3) with closed rear ventilation, and

Fig. 258a a partial section along the line J-J of fig. 257a (especially with diagonal poles without any ball-joint), and

Fig. 259a a back view of fig. 257a.

Fig. 260a shows a top view of the tent of example 1 (similar 2, 3, 6) with open rear ventilation, and

Fig. 261a a partial section along said line J-J here of fig. 260a.

## Variants of Poles

Figs. 262d to 265d show the ends of several rods of the poles, and

Figs. 266d to 269d each next rod with larger diameter, and

Figs. 270d to 273d their cross sections along the lines K-K, L-L, M-M and N-N of the figs. 266d to 269d.

Figs. 274d to 276d show the ends of several rods of the poles, and

Figs. 277d to 279d each next rod with equal diameter, and

Figs. 280d and 281d their cross sections along the lines O-O and P-P of the figs. 277d and 278d.

Fig. 282b shows a front pole similar fig. 52b, but united with said both lateral front rods, and

Fig. 283b its top view, and

Figs. 284b, 285b and 286b several views of its middle rod, especially made from steel.

Fig. 287b shows a straight front pole provided with thin rods in the middle, instead of the front pole with a curved rod in fig. 112b.

Fig. 288b shows a front pole similar fig. 156b, but united with the said middle front rod, and

Fig. 289b its top view, and

Figs. 290b, 291b and 292b views of its middle front rod, especially made from steel.

Figs. 293b and 293k show (in unloaded position) a middle pole instead of fig. 68b, but provided with big clearance between their rods, and

Figs. 294d and 295d sections of its inner rods in two different versions.

Figs. 296b shows the front parts of any diagonal pole.

Fig. 297b shows the diagonal pole of fig. 59b, here provided with different rods as well as a second stop, the latter in mounted condition shown in fig. 354a.

Fig. 298b shows a diagonal pole similar fig. 59b, but with a different detail Q illustrated in

Fig. 299e which is a detail Q of fig. 298a and illustrates a different single ball-joint in about full scale (1:1), mounted shown in fig. 357a.

Fig. 300b shows an about picture of the lateral forks used in the diagonal poles illustrated in the figs. 147b, 171b or 186b.

Fig. 301b shows a picture of the fork used in the diagonal poles illustrated in fig. 59b.

Figs. 302b and 303b show each top views of the fig. 301b and illustrates the before and the behind fork of an imagined frame.

Fig. 304b shows the mounted behind fork of fig. 41d, but in smaller scale.

Fig. 305b is a long-hole and shows a section along the line R-R of fig. 304b, thus through the front joining, but without any front pole.

Fig. 306b shows a section along the line S-S of fig. 304b, thus the behind fork with the mounted and stressed end of front pole.

Fig. 307d shows the end of any rod of glass fibre or symilar material, and

Fig. 308d the suited end of the next rod of glass fibre with thicker diameter, for the plug-joining by means of a reduction hull, and

Fig. 309d a section along the line T-T of fig. 308d.

## Variants of Diagonal Poles

Figs. 310a and 311a are a side view and a top view illustrating the erected frame with inner tent (similar example 1, figs. 71b and 72b in different scale) with the following diagonal pole (in different scale), and

Fig. 312a a front view of fig. 310a without any front pole.

Fig. 313b shows (similar example 1, fig. 59b) one of both equal diagonal poles when mounted, for figs. 310a to 312a, and

Fig. 313k when knocked down in its component parts (during manufacturing).

Fig. 314d shows an enlarged detail U of fig. 313k in section along line V-V of fig. 320e, and is a fork-assembly.

Fig. 315b shows the belonging new middle pole of the frame here now used.

Figs. 316a and 317a are a side view and a top view illustrating the erected frame with inner tent (similar example 7), with the following diagonal pole (in different scale).

Fig. 318b shows (similar example 7, fig. 147b) one of both equal diagonal poles when mounted, for the figs. 316a and 317a, and

Fig. 318k when knocked down in its component parts (during manufacturing).

Fig. 319d shows an enlarged detail W of fig. 318k in section along line V-V of fig. 320e, and is a fork-assembly.

Fig. 320e shows a cross section in approximately full scale (1:1) along the lines X-X, Y-Y and similar Z-Z (in about full scale 1:1) of the figs. 314d and 319d.

Fig. 321b shows (similar example 9, fig. 171b) one of both equal diagonal poles when mounted.

Fig. 322b shows (similar example 10, fig. 186b) one of both equal diagonal poles when mounted.

Figs. 323a, 324a and 325a are perspective views illustrating the tents of the examples 1 to 6 in accordance with the invention, now with the equal diagonal poles from fig. 312b.

Figs. 326a, 327a and 328a are perspective views illustrating the tents of the examples 7, 7SP and 8 in accordance with the invention, now with the equal diagonal poles from fig. 318b.

Figs. 329a or 339a are perspective views illustrating the tents of the examples 9 or 10 in accordance with the invention, now with the equal diagonal poles from fig. 321b or 322b.

#### Self-stressing Forks

Fig. 331a illustrates the tent of example 1 in side view during the mounting operation according to fig. 85 (there shown in perspective view and different scale), and

Fig. 332a in the belonging top view.

Figs. 333a and 334a show the same position in side and top views, now with the attached front pole in its under position, and

Fig. 335a and 336a in its upper position, thus inner tent and frame in mounted condition as illustrates in different scale in the figs. 71b and 72b.

Fig. 337d shows (suited for the examples 1, 2, 3, also the following figures) the before self-stressing fork in side view in the under position of its front joining.

Fig. 338d shows a top view of the behind fork, and

Fig. 339d a top view of fig. 337, thus the before fork, both figures in the under position of the front joining.

Fig. 340d illustrates the before fork of fig. 337 in the upper position of its front joining, and in dash-dotted lines in its former under position. The lines **A-A** and **B-B** are the swivelling axles of the front joinings; A-A of the before fork, and B-B of the behind fork.

Fig. 341d shows a top view of the behind fork, and

Fig. 342d a top view of fig. 340d, thus the before fork, both figures in the upper position of the front joining, with their former under position in dash-dotted lines.

Fig. 343d shows the before fork of fig. 340d, in section along line D-D of fig. 342d, in the upper position of its front joining.

Fig. 344d shows a section along the line E-E of fig. 343d.

Fig. 345d shows a section along the line F-F of fig. 343d.

Fig. 346d illustrates the before fork (suited for the examples 7, 7SP, 8) in the upper position of its front joining, and the latter in dash-dotted lines in its former under position, and

Fig. 347d the before fork of fig. 347d in section in the upper position of its front joining.

Fig. 348d illustrates the before fork (suited for the examples 1 to 6 with diagonal poles like the variant of fig. 313b) in the upper position of its front joining, and the latter in dash-dotted lines in its former under position, and

Fig. 349d the before fork of fig. 348d in section in the upper position of its front joining.

Fig. 350d shows an optional detail of the upper end of fig. 349d as well as fig. 314d when made of steel by welding or hard soldering.

Fig. 351d illustrates the before fork (suited for the examples 7, 7SP, 8 with diagonal poles like the variant of fig. 319b) in the upper position of its front joining, and the latter in dash-dotted lines in its former under position, and

Fig. 352d the before fork of fig. 351d in section in the upper position of its front joining.

#### Variants of Connections

Fig. 353a shows a perspective view lateral from the rear on the tent of example 1, with the connection of the diagonal poles with the inner tent by means of long loops.

Fig. 354a illustrates a similar perspective view on the tent of example 1, with two additional rear stops at the diagonal poles, thus total four stops enlarged shown (with the front poles provided with each two stops as illustrated in fig. 297b).

Fig. 355a shows in similar perspective view a part of the tent of example 1, but with additional cross strings, and

Fig. 356a its inner tent alone imagined in erected position.

Fig. 357a shows the tent of example 1 with the diagonal pole and ball-joint of figs. 298b and 299e, and

Fig. 358a a connection rod used at it.

Fig. 359d illustrates the snap hook of example 1 as shown in the figs. 48d and 881c, and in said different examples on this spots.

Figs. 360d to 366d show possible variants of fig. 359d.

Fig. 367a shows a top view of the inner tent of example 1 to 6 ( or similar 7, 8, 9) imagined in erected position, and

Fig. 368d an enlarged detail J of fig. 367a, and

Fig. 369d its side view.

Figs. 370d and 371d show sections M-M and N-N of each other through the front below corners of the inner tent respective the below front end of the diagonal poles at the examples 1 to 9.

Fig. 372e shows a variant of the detail **E** of fig. 39b in perspective view (scale about 1:10) of the below front ends of the inner tent, and

Fig. 373e a section along the line P-P of fig. 372e (scale about 1:10).

#### Variants of Tents

Fig. 374a shows a tent whose shape is a combination of the examples 7SP and 9, and

Fig. 375a its inner tent and frame, provided with only one string between inner tent and front pole.

Fig. 376a shows a front view of the inner tent of the examples 1, 2 and 3 (also similar 12, 13, 15, 16) with an inner partition wall and two front zippers.

Fig. 377 shows the tent of the examples 1, 4, or 13 with sloping front entry.

Fig. 378 shows a section along the line Q-Q of fig. 377 illustrating the bottom of the inner tent as a trapezoid.

Fig. 379 shows the tent of the examples 7SP or 12 with the middle front rod inside the cover tent.

Fig. 380 shows the tent of the examples 7SP or 12 without any middle front rod.

Figs. 381, 382, 383 and 384 show several tents without any front lateral rods.

Fig. 385b shows the complete front cross rod of the front pole belonging to the figs. 381, 382, 383 and 384.

#### Storm Ropes

Fig. 386a shows the tent of the examples 1, 4 or 13 provided with storm ropes, or the front roof stressed by means of front strings without any both lateral front rods.

Figs. 387a, 388a and 389a show several tents provided with storm ropes normally not used.

Figs. 390d and 391d show enlarged details S and T of the figs. 386a and 389a, in which the rain-protected holes for the storm ropes through the cover tents are drawn in dash-dotted lines.

#### Tents with Ring-pole

##### Example 11

Figs. 392a to 429a illustrate a tent in accordance with the invention, here called with "ring-pole", as follows:

Fig. 392 a shows a partial section along the line V-V of fig. 394a.

Fig. 393a shows a side view of said tent, and Fig. 394a a front view.

Fig. 395a shows a back view of inner tent with frame, and

Fig. 396a a side view, and

Fig. 397a a front view as section along the line W-W of fig. 396a, and

Fig. 398a a top view.

Fig. 399a a shows a top view only of the inner tent, imagined in stressed position.

Fig. 400 shows a top view of said tent in different scale.

Fig. 401d shows an enlarged detail X of fig. 407k and illustrates both lateral forks, and Fig. 502d the same fork in section along the line Y-Y of fig. 503d, and

Figs. 403d and 404d different views of said fork.

Fig. 405b shows an enlarged partial section along the line A-A of fig. 396a, and

Fig. 406b an enlarged detail B of fig. 396a.

Fig. 407a shows a ring-pole, in accordance with the invention, when mounted, and

Fig. 407c when collapsed for transport, and

Fig. 407k when knocked down in its component parts (during manufacturing).

Figs. 408a and 409a show the equal rear poles when mounted, and

Figs. 408c and 409c when collapsed for transport, and

Figs. 408k and 409k when knocked down in its component parts (during manufacturing).

Figs. 410a and 411a show the front lateral rods.

Fig. 412a shows a back view of the ring-frame in fig. 407a.

Fig. 413d is an enlarged detail D of fig. 407k and shows the front middle rod, below in partial section along the line E-E of fig. 414a, and

Fig. 414a its section along the lines F-F of fig. 413a.

Fig. 415d shows an enlarged detail H of the fig. 407a.

Fig. 416d shows an enlarged detail I of the figs. 408a and 409a.

Fig. 417d shows an enlarged detail J of the figs. 408a and 409a, and

Fig. 418d its stopper.

Fig. 419d is an enlarged detail L of fig. 407k and shows the centre cross rod, below in partial section along the line M-M of fig. 420a, and

Fig. 420d its different view, below in partial section along the line N-N of fig. 419d, and

Fig. 421d its view in the direction of the arrow P of fig. 419a, and

Fig. 422b its optional shape when made of steel.

Fig. 423a shows a top view and

Figs. 424a and 425a side views illustrating the start of the mounting operation of the tent with the ring-pole lying on the ground.

Figs. 426a, 427a and 428a show in perspective view the subsequent positions during the mounting operation.

Fig. 429a shows said tent completely erected.

##### Example 12

Fig. 430a illustrates a tent similar example 11 and 7SP, also in accordance with the invention, in perspective view, and

Fig. 431a in top view, and

Fig. 431b a partial section along line R-R of fig. 431a. Example 13

Figs. 432a to fig. 451a illustrates a tent similar example 10, but provided with an additional middle pole, in accordance with the invention:

Figs. 432a to 444a as well as the sections V-V, W-W, Y-Y and detail X are similar as figs. 392a to 404a.

Figs. 445 shows a top view of a similar tent in accordance with the invention.

Fig. 446a shows a middle pole when mounted, and

Fig. 446c when collapsed for transport, and

Fig. 446k when knocked down in its component parts (during manufacturing).

Fig. 447a shows a ring-pole when mounted, and

Fig. 447c when collapsed for transport, and

Fig. 447k when knocked down in its component parts (during manufacturing).

Figs. 448a and 449a show the rear poles when mounted.

Figs. 450a and 451a show the front lateral rods.

#### Example 14

Figs. 452a to fig. 463a illustrates a tent similar example 10, but provided with low front entry but high inner tent, in accordance with the invention:

Figs. 452a to 460a as well as the sections U-U and V-V are similar as figs. 392a to 400.

Fig. 461a shows a ring-pole when mounted, and

Fig. 461c when collapsed for transport, and

Fig. 461k when knocked down in its component parts (during manufacturing).

Figs. 462a and 463a show the rear poles when mounted.

#### Example 15

Fig. 464a shows the front pole when mounted, and

Fig. 464c when collapsed for transport, and

Fig. 464k when knocked down in its component parts (during the manufacturing).

Fig. 465b shows the angular pole when mounted, and

Fig. 465c when collapsed for transport, and

Fig. 465k when knocked down in its component parts.

Fig. 466d shows a detail W of fig. 465k, thus one centre fork of the crossing-rod.

Figs. 467a and 468a show the rear poles, and

Figs. 469a and 470a the back poles, and

Fig. 471a the middle pole.

Fig. 472a shows the ring-pole, thus front pole with angular pole, here with the front tent, at the beginning of mounting operation, in accordance

with the invention.

Fig. 473a shows an open tent, thus without any front tent, and

Fig. 474a show the tent with the front tent, and

Fig. 475 its top view.

#### Example 16

Fig. 476a shows the front pole (with middle angle piece) when mounted, optionally separated in two half poles, and

Fig. 476c when collapsed for transport, and

Fig. 476k when knocked down in its component parts.

Fig. 477a shows the angular pole when mounted, and

Fig. 477c when collapsed for transport, and

Fig. 477k when knocked down in its component parts.

Fig. 478d shows a detail X of fig. 477k, thus the crossing-piece, connected with the next rod.

Figs. 479a and 480a show the rear poles, and

Fig. 481a the middle back pole, and

Fig. 482a the middle pole, and

Fig. 483 the additional front frame (for the front tent).

Fig. 484a shows the ring-pole, thus front pole with angular pole, with the front tent, at the beginning of mounting.

Fig. 485a shows an open tent, thus without any front tent, and

Fig. 486a show the tent with the front tent, and

Fig. 487 its top view.

#### Tent in Car

Figs. 488a and 489a show a car from the side and from the top, in sections Y-Y and Z-Z of each other.

#### EXAMPLES 1 TO 10 WITH DIAGONAL POLES

Every tent **1, 2, 3, 4, 5, 6, 7, 8, 9** or **10** of the examples 1 to 10 shown in the figs. 1 to 8 is composed of a frame **11, 12, 13, 17, 18, 19** or **20** illustrated in erected condition in the figs. 92a, 95a, 96a, 137a, 138a, 139a, 166a or 181a, and as shown in the figs. 31 to 38 of an inner tent **21** (for the examples 1 to 6), an inner tent **27** (for the examples 7, 7SP and 8) and an inner tent **29** or **30** (for the examples 9 or 10), and a (complete) cover tent **31, 32, 33, 37, 38, 39** or **40**, shown in the figs. 19 to 26.

In the examples 2, 3 and 8 shown in the figs. 2, 3 and 6, said tents 2, 3 and 8 are composed of a separate front tent **42, 43** or **48**, and an open tent **52, 53** or similar **58** shown in the fig. 10, connected by means of a zipper **59** next the front top loop **60**

of an "open cover tent" **62**, **63** or **68**, visible in the figs. 113a, 121a and 163a. The "open cover tent" **62**, **63** or **68** and the front tent **42**, **43** or **48** form now here each the complete cover tent **32**, **33** or **38**.

The cover tent **69** and the frame **70** belong to the tent **71** example 7SP (sloped pointed).

#### Inner tents

The simplest inner tent **29** is used in example **9** as shown in fig. 167a in half-ready manufactured condition. It is provided with four below corners **72**, **73**, **74** and **75**, a front top corner **76**, two front top below corners **77**, **78** and two rear top corners **79**, **80**. The different inner tents **21**, **27** and **30** have each two top centre corners **81** and **82**. The inner tent **21** (examples **1**, **2** and **3**) shown in fig. 100a has two front top corners **83**, **84** and two additional side corners **85**.

Said inner tent **29** in fig. 167a consists of a waterproof tent bottom **86** as well as plane walls of fabric subsequently mentioned: The sloping front area **87**, lateral areas **88**, **89**, two top side areas **90**, rear area **91** and top back area **92**. Straight edges **93**, **94**, **95**, **96** are between them. The different inner tents **21**, **27** and **30** have an additional top area **97**. The inner tent **21** (examples **1**, **2**, **3**) in fig. 100a has a plane vertical front area **98** and two additional side areas **99**.

As shown in fig. 146a, only one front top string **100** is also possible at the front top corner **76** of the inner tent **27** when used for tent **71** (example 7SP). But mostly two front top strings **101**, **102** (or bands) are fixed at the front top corner **76** or at the front top corners **83** and **84**, as the inner tents **21**, **27**, **29** and **30** show in the figs. 101a, 142a, 168a and 183a. Under said front top strings **101** and **102**, two front below strings **103**, **104** (or bands) are placed, especially of elastic.

Above, two top main-bands **105** and **106** are placed, either in fig. 168a fixed at the top corner **76**, or in the figs. 101a, 142a and 183a at the top centre corners **81** and **82**. In the rear, there are two rear top bands **107** and **108** at the rear top corners **79** and **80**. In the figs. 101a, 142a and 168a, there are front short bands **109**, **110** in half height, lateral bands **111**, **112**, and rear bands **113**, **114**, each one provided with triangles **115**.

The inner tent **21** in fig. 101a is provided with four vertical bands **116**, **117**, **118** and **119** at the front top corners **77**, **78**, **83**, **84**, and two side bands **120**, **121**.

The ends of the front strings **100** to **104**, of the lateral bands **111**, **112**, and of the vertical bands **116** to **129** are each provided with different hooks **122**, and the ends of the other bands **105** to **110**; **113**, **114**; **120**, **121** with top snap hooks **123**, rear

snap hooks **124** and front snap hooks **125** (or any different suited connection part).

Every inner tent **21**, **27**, **29** and **30** is below provided with four flaps **127**, **128**, **129**, **130** with each a hole **131**, a semicircle eye **133**, and perhaps an additional upper semicircle eye **134** (figs. 40d and 46d) as well as some small loops **135** (fig. 39b), and in front provided with a curved zipper **136** or a middle zipper **137**, and with one or two horizontal zippers **139**, **140** for the inner entries **141**, **147**, **149** or **150**. To hold open the last ones, the inner tents **21**, **27**, **29** and **30** are each provided with bands or burr bands not shown.

#### Frames

The frames **11**, **12** and **13** (examples **1**, **2**, **3**) are each provided with equal (or symmetric) diagonal poles **151** and **152**. The similar frames of the tents **4**, **5**, **6** (examples **4**, **5**, **6**) have each equal (or symmetric) diagonal poles **153** and **154**. The frames **17**, **18**, **70** (examples **7**, **8**, 7SP) have equal (or symmetric) diagonal poles **155** and **156**. The frame **19** (example **9**) has equal (or symmetric) diagonal poles **157**, and **158** and the frame **20** (example **10**) equal (or symmetric) diagonal poles **159** and **160**. The frames **11**, **12**, **13**, **17**, **18**, **19** or **20** are provided with different front poles **161**, **162**, **163**, **167**, **168**, **169** or **170**. The frames **11**, **12** and **13** (examples **1**, **2**, **3**) have an equal middle pole **171**. An additional second frame **173** is mounted in front of the frame **13** (example **3**). All the lately specified rods of said frames and poles are connected by means of detachable plug-joinings **174** or **175** (used in fig. 59b for example) for different or equal rod diameter as illustrated in the figs. 262d, 266d; 274d, 277d.

The erected frame **11** (example **1**) is shown in the figs. 39b, 71b, 72b, as well as 92a in smaller size. In the figs. 49b to 70d the parts of said frame **11** are illustrated with one diagonal pole **151**. The second diagonal pole **152** is equal or symmetric.

As shown in the figs. 59b and 71b, the diagonal poles **151** and **152** consist each of a front lower section **176**, a lateral fork **177** (or each a symmetric lateral fork), a front top section **178**, a rear top section **179**, and a rear lower section **180**.

As fig. 59b shows, the diagonal poles **151** and **152** are each composed of the following component parts shown in fig. 59k, beginning from said lateral fork **177** to the top: A stronger rod **183**, a strong rod **184**, a thin rod **185**, a separate double ball-joint **186** used at its front face **187** as a stop **188**, three thin rods **189**, **190** and **191**, a strong rod **192**, a strong(er) rod **193**, a strong rod **194**, a stressing elastic **195** continuously inside, and a plug **196** with a pin **197**.

Beginning from said lateral fork 177 to the bottom: A much stronger rod **198** connected with said lateral fork 177, a stronger rod **199**, the said stressing elastic 195, and a plug **200** with pin **201** and head **202** having a cross hole **203**.

The lateral forks 177 are each provided with a front joining **205**, a middle joining **206**, a rear joining **207**, a below joining **208**, and a rear eye **209**.

The diagonal poles 151, 152 of the examples 1, 2, 3 may be performed without the ball-joint 186. Thus as shown in fig. 130a.

The different diagonal poles 153,154; 155,156; 157,158 or 159, 160 (examples 4, 5, 6; 7, 8; 9; 10) shown in the figs. 130a, 147b, 171b and 186b are somewhat shorter. Besides 153, 154, they have each different lateral forks **217**, **219** or **220** without any middle joining, may be with each a top eye **221** (for any storm rope). The short poles 159,160 (example 10) shown in fig. 186b have thinner rods and each a normal plug **222** with a straight pin **223** in front below.

The rod 185 is in the examples 4 to 10 provided with a fixed hull **224** shown in the figs. 148d and 148e. Its front face 187 is used as a stop 188.

The **middle pole** 171 used in the frames 11, 12 and 13 (examples 1, 2, 3) shown in the figs. 68b,k is (beginning from its ends) composed of two plugs **225**, **226** connected with a continuously stressing elastic **227** inside, two curved strong rods **228**, **229**, and three curved inner rods **231**, **232** and **232**.

The frames 11, 17, 19 and 20 (examples 1, 7, 9, 10) are each provided with a similar **front pole** 161, 167, 169 or 170 which forms the front projecting range **234** of each frame, shown in the figs. 109a, 151a,b,k, 175a,b,k and 192a,b,k. Also in fig. 52b, beginning from its ends, it is each composed of two plugs **235**, **236**, connected by means of a continuously stressing elastic **237** inside, two stronger rods **239**, **240**, two strong rods **241**, **242** - (except example 10), two rods **243**, **244** and a complete front cross rod **250**. The latter is shown in fig. 53d and is composed of a cross rod **251** and two angle pieces **257**, **258** connected by means of two screws **259**. Each angle piece 257, 258 is provided with an eye **260** as well as with a hole **261** for the attaching of both equal separate front lateral rods **263**, **264** shown in the figs. 49b, 50b, 51d, 154a,b; 155a,b, 178a,b; 179a,b and 195a,b; 196a,b, provided with a fixed hull **265** and two holes **266**.

The frames 12 and 18 (examples 2, 8) have in the front projecting range 234 each another front pole 162 or 168 shown in the figs. 112a,b,k and 196a,b,k. Beginning from their ends, they are each composed of two plugs **271**, **272**, connected by a continuously stressing elastic **273** inside, two stron-

ger rods **275**, **276** (in frame 18, consisting of different pipes **277**, **278** fixedly joined with each other), two strong rods **279**, **280** (except example 8), two rods **281**, **282** and a curved rod **283** in the middle.

The frames 13 and 70 (examples 3, 7SP) have each a similar front pole 163 or **290** shown in the figs. 116a,b,k and 156a,b,k. Beginning from their ends, they are each composed of two plugs **295**, **296**, connected by a continuously stressing elastic **297** inside, two stronger rods **299**, **300**, two strong rods **301**, **302**, (each) two rods **303**, **304** and one middle angle piece **305**. The latter is shown in the figs. 117d to 120d and 157d to 160d and is fixed on one next rod 303 and is provided with a hole **306**. This middle angle piece 305 is used either in the frame 70 (example 7SP) for the attaching of the middle front rod **307** (with hull 265 and two holes 266, like fig. 51d) shown in fig. 161a,b, or in the frame 13 (example 3) for the support of the second frame 173 subsequently described.

The additional **second frame** 173 (example 3 as well as 16) is illustrated in the figs. 122a to 129d. As shown in fig. 127d, its T-piece **310** is fixed at the strong longitudinal rod **311**. Next it, there is the connection longitudinal rod **312**, at which two hulls **313**, **314** and a short string **315** are fixed, as shown in fig. 128d. The latter is provided with a snap hook **316**. As shown in fig. 122b,k, next the T-piece 310 two strong rods **317**, **318** are laterally placed. Then each three rods **319**, **320** and two rods **321**, **322**. The ends of the second frame 173 are provided in the right, left and middle with equal plugs **323**, **324** and **325** having each a notch **326** and connected by means of a stressing elastic **327** inside. At the left plug 324 at its notch 326, a long below cross string **328** is fixed having another snap hook **329** at its other end. Said both snap hooks 316 and 329 are suited for the mounting in said notches 326.

The double **ball-joint** 186 shown in fig. 67e is performed as a swivelling symmetric ball-hull **331**, having two holes **332** with larger diameters than the spherical movable ends of the next rods 185 and 189. The ball-hull 331 is provided with two inner cones **333** and two end cones **334**, and inside two front cones **335** (or a section of a ball as shown). By said ball-joints 186, lower bending and stress of the diagonal poles 151 and 152 is gained, and also the possibility of high tents on a small tent bottom.

The angle in this double ball-joint 186 may be smaller. Then its ball-hull 331 has a smaller diameter.

For the securing of the erected position, there may exist also two inner notches **336** and suited projecting ends **337** of said next rods 185 and 189.

The material of the rods mentioned previously is especially strong aluminium. But also different

material may be used like glass-fibre, steel or any suited present or future material.

#### Cover tent and Ventilation

The cover tents 31, 37, 39 and 40 (examples 1, 7, 9, 10 as well as 11, 12, 13) shown in the figs. 91a, 134a, 165a and 180a are in front above provided with each a **front roof 340** hold by both front lateral rods 263, 264, and for the outer entries **341, 347, 349, 350** with each a long zipper **351** and two top lateral short zippers **352** as shown in the figs. 251a and 254a as well as 252a and 255a with the variable **front ventilation 353** in open condition of its air flap **354**. Then said front roof 340 protects it against any rain.

The cover tent 71 (example 7SP) shown in fig. 135a is in front above provided with a different front roof **356** hold by the middle front rod 307, and for the outer entry **357** with a long zipper **358** and one top lateral short zipper **359** as shown in the figs. 253a and 256a when the variable front ventilation **360** is opened by its air flap **361**. With the mentioned protection also here by said front roof 356.

The figs. 221a, 222a and 223a (examples 1, 7, 9, 10, 7SP as well as 11, 12, 13) show the below front part **362** of the previously mentioned cover tents 31, 37, 39, 40, 69 tied back under hot weather by means of each two bands **363** at them, especially with hooks **365, 366** hung in the front pole 161, 167, 169, 170 or 290, or by means of burr bands.

The "open cover tent" 62, 63 and 68 (examples 2, 3, 8 as well as 15, 16) shown in the figs. 113a, 121a and 163a are provided with two lateral triangles **371, 372** with each a burr-band **373** at their ends, and each a corresponding burr-band **374** inside said "open cover tent" 62, 63 or 68, as well as in front above inside with four (semicircle) eyes **375** as shown in the figs. 114e, 140e.

The "open cover tent" 63 (example 3, fig. 121a, as well as 15, 16) is provided with a middle break **376** in the front top loop 60 for the attaching of the second frame 173.

The cover tents 31, 32, 33 and 38 (examples 1, 2, 3, 8 as well as different examples) as shown in the figs. 91a, 93a, 94a and 136a are back above in the interspace **379** provided with a variable **rear ventilation 380** illustrated in the figs. 257a to 260a consisting of: An air flap **381**, two zippers **383, 384**, two burr-bands **385, 386**, and a sloping area **388** of waterproof fabric for the protection against any rain when opened as well as for the outside drainage of any water.

The cover tents 31, 32, 33, 37, 38, 39, 40 or 69 (examples 1 to 10, 7SP as well as examples 11, 13, 14) have below a nearly plane rear wall **390**.

Every cover tent is especially of synthetic fabric or any different sheet material, and is as usually below provided with small loops for the tent nails and perhaps with hooks for the connection with the semicircle eyes 134 (figs. 40d and 46d) of the inner tent 21, 27, 29 or 30), here not shown. They are also provided with bands or burr bands not shown for the connection with its frame 11, 12, 13, 17, 18, 19, 20 or 70, or to hold open the outer entries 341, 344, 347, 348, 357; 412, 413 (as well as in the examples 11 to 16).

#### Mounting

As fig. 82 shows, in the beginning of mounting operation the inner tent 21 (example 1) is spread on the earth ground. The front pins 201 of the diagonal poles 151, 152 are secured in the holes 131 of both front flaps 127, 128 of the tent bottom 86 either by means of two usual tent nails **395** crossly mounted in their cross holes 203, as illustrated in fig. 40d, or by any different suited short pegs. As fig. 41d shows, both small front snap hooks 125 of the front short bands 109, 110, placed about in half height in front of the inner tent 21, are hung in the eyes 209 of the lateral forks 177. Now the top snap hooks 123 and the rear snap hooks 124 are hung into the diagonal poles 151, 152 before and behind the stops 188. Nothing can be loosened by any mistake during the mounting operation.

As can be seen in the figs. 83 and 84, now firstly the upper diagonal pole 152 is stressed (possible by one single person), then the under diagonal pole 151 (also by the same single person). The motion of the top snap hooks 123 then is finished by the stops 188 in exact position. Now the diagonal poles 151, 152 are engaged as usually with their pins 197 into holes 131 of the rear flaps 129, 130, as can be seen in fig. 46d.

As fig. 85 shows, then the middle pole 171 is attached. In the latter the vertical bands 116, 117, 118, 119 are hung by their hooks 122.

As shown in fig. 86, now the front pole 161 is put into one lateral fork 177. Then the front pole 161 is bent by one hand and the other lateral fork 177 (of the other diagonal pole 165) is adjusted by the other hand, till they can be shoved one into another. This is possible first by the elasticity of the frame 11 and second by the large clearance between the the ends of the front pole 161 with the small diameter **s** (fig. 58d) and the lateral forks 177 with the larger diameter **l** (see fig. 61d) of the hole **400** in its front joining 205, as can be seen in fig. 61d. (By this large clearance, its **detachment** is also possible during the later **disassembly** of the tent.)

As illustrated in fig. 87, then the front pole 161 is pushed to the rear by one hand in direction **R**, and simultaneously one front top string 101 (of four front strings) is caught by the other hand and is pulled to the front in direction **S**. This forces by hand at the rods are abnormal large. At the lateral fork 177, the rods 183 and 239 or 240 (see fig. 71b) bear this, because they are stronger. The forces **R** and **S** are not exactly balanced. Their difference acts at the rod 198 below the lateral fork 177 which have to be stronger also from this reason.

Now the hooks 122 of the other front strings 102, 103, 104 are hung in the front pole 161. Fig. 42d shows it for the hook 122 placed next a step 405. Frame 11 and inner tent 21 are now erected and stand without any pegs, as can be seen in the figs. 39b and 88.

As shown in fig. 89, now the cover tent 31 is put over the frame 11.

As fig. 77d shows, then both front lateral rods 263, 264 are attached into the holes 261 of the angle pieces 257, 258 at the front pole 161. The hooks 122 of the front top strings 101, 102 are now changed and hung in the holes 266 of the front lateral rods 263 and 264, as shown in fig. 76d. The latter are now secured by said hooks 122 and also the front roof 340. The tent 1 is illustrated in this position in the figs. 90 and 91a. If the cover tent 31 may be connected at the semicircle eyes 134 at the four flaps 127, 128, 129, 130 for this position, at least only four tent nails 395 are required to be stroke in the ground. Or more tent nails 395 are used as shown in the fig. 257a, also for the inner tent 21 there not shown.

The disassembly of tent 1 is done under normal circumstances approximately in inverse way than described. The both in front lower elastic strings 103, 104 avoid their overload when in front at last disconnected (by their elastic action).

For disassembly **under rain**, the hooks 122 and snap hooks 123, 124, 125 permit to hang off firstly the inner tent 21 from inside. The cover tent 31 with the frame 11 are standing provisionally. Under its protection, the inner tent 21 is folded up and remains dry. The cover tent 31 and the frame 11 are collapsed finally.

The mounting is similar in the further embodiments or examples with the following exceptions:

The middle pole 171 exists only in the examples 1 to 6 (as well as in the examples 13, 15, 16). Hence in the different examples 7 to 10 the concerning section of the mounting operation cancels, thus in fig. 85.

In the example 7, two front top strings 101, 102 are hung preferably in only one middle front rod 307 for reason of securing.

In the example 9, fig. 166a, in different manner, the front below strings 103, 104 are hung in the diagonal poles 157, 158.

In the examples 7 to 9 with the lower inner tents 27 and 29, the securing of the shorter diagonal poles 155, 156 as well as 157, 158 may be done in front below only by said head 202. (Thus perhaps without any assistance of any cross mounted tent nail 395.)

In the example 10 with the small inner tent 30, the attaching of the short diagonal poles 159 and 160 is done in usual manner only by four straight normal pins 197 and 223 in front and rear.

In the examples 2, 3 and 8 shown in the figs. 113a, 121a and 163a with in front "open cover tent" 62, 63 and 68, the course of mounting is somewhat different. The front pole 162, 163 or 168 is shoved firstly into the top loop 60 of the "open cover tent" 62, 63 or 68 which is spread on the ground. During the later course of mounting, the four front strings 101, 102, 103, 104 are hung in the eyes 375 of the "open cover tent" 62, 63 or 68 (thus not directly in the front pole 162, 163 or 168). At last, both lateral triangles 371, 372 of the "open cover tent" 62, 63 or 68 are connected around the frame 12, 13 or 18 by means of the burr-bands 373, 374 as shown in the figs. 115a and 164a. Under cold weather, the front tent 42, 43 or 48 is connected by means of the zipper 59 also used as outer entry 412 or 413 as shown in the figs. 202, 203 as well as 205, 206 at one or both sides.

In the example 3, during the mounting of the second frame 173 (shown in the figs. 122b, 123b), at first the latter is stressed by means of its snap hook 329 on the long below cross string 328 now attached in the opposite notch 326 of the right plug 323. As illustrated in the figs. 96a, 98e and 99d, then the top connection longitudinal rod 312 of the now erected second frame 173 is attached in the hole 306 of the middle angle piece 305 in the already erected front pole 163, and is secured by means of the other snap hook 316 mounted in the near notch 326 of the middle plug 325.

#### Demonstration of Clearance at Lateral Fork

Present time, suited pipe material for the mentioned rods in the required quality is available in the dimensions 10x0.9, 12x0.9, 14x0.9, 16x0.9 and 18x0.9 mm, thus the diameter x wall thickness. (In future, also different sizes may be possible.) Therefore, the play in the plug-joinings 174 or 175 may be for example 0.2 mm. (But also any somewhat larger different play may exist.)

For example, in the fig. 61d, the inner larger diameter **l** of any lateral fork may be 16 mm. In the fig. 58d the outer small diameter **s** may be 14 mm of the end of any front pole. This way, they can by

easily mounted by their clearance of 2 mm, as already described, and really done on any erected tent according to the invention.

For the demonstration of the bad action of any play of 0.2 mm like in the plug-joinings 174, 175 also at this spot, the following experiment has to do:

An intermediate hull with 16x0.9 mm with the length of the front joining 205 of any lateral forks is pushed into them. This way, now only a clearance of 0.2 mm exists at this spots. If now the front pole is tried to attach, it is very difficulty to to this.

After any time, with some luck, the front pole may completely be mounted in the lateral fork also with this small clearance. But now it is impossible to detach it. The front pole is now fixed in the lateral fork as being welded.

The clearance may be instead 2 mm also 1 mm or 3 mm or any similar value, depending of the size of the tent.

#### VARIANTS OF EXAMPLES 1 TO 10

##### Variants of Poles

Figs. 262d to 273d show the detachable plug-joining 174 as previously illustrated between the rods of different diameters (see fig. 59b), here shown between the rod-ends **420**, **421** by means of a short hull **422** fixed inside by lateral press **423**. Similar plug connections **424**, **425** and **426** are shown in the figs. 263d, 267d; 264d, 268d as well as 265d, 269d by means of a cut **427**, a notch **428** or a pin **429**.

Figs. 274d to 281d show the detachable plug-joining 175 as illustrated in the frames between the rods of equal diameter (see also fig. 59b), here shown between the rod-ends **431**, **432** by means of a long hull **433** fixed outside by lateral press **434**. Similar plug connections **435**, **436** are shown in the figs. 275d, 278d by means of a long inner hull **437**, as well as in the figs. 276d, 279d by means of a reduced peg **438**.

The figs. 282b to 286b show a front pole **440** which is a variant of the front pole 161 (or similar 167, 169, 170; example 1, similar example 7, 9, 10) illustrated in fig. 52b: Both front lateral rods 263 and 264 are now fixedly attached at the front cross rod **441** (instead of the complete front cross rod 250) especially made of steel, without any separate angle pieces 257, 258.

Fig. 287b shows a front pole **442** (instead of the front pole 162 or similar 168, figs. 112b or 162b, examples 2, 8) without any middle curved rod 283. Instead of it, three thin rods **443** exist.

The figs. 288b to 292b show a front pole **445** - (instead of the front pole 290, fig. 156b, example 7SP): Now the middle front rod 307 is fixedly

attached at the middle angle piece 305 especially made of steel, now angle rod **446**.

The figs. 293b, 293k, 294d and 295d show a middle pole **450** (instead of the middle pole 171, fig. 68b, examples 1, 2, 3): Its inner rods **451** are now provided with reduced hulls **452** (fig. 294d) or additional intermediate hulls **453** between the outer hull **454** and the pipe **455** (fig. 295d). By this, a large play results among all the rods **451** and **456**. In unstressed condition, the front pole 450 can already be curved as illustrated in fig. 293b. Therefore, its rods **451** and **456** are less bent when mounted.

Fig. 296b shows only one (longer) rod **458** below any lateral fork 217, 219, 220 or similar also 177. If made from steel, they may be one part. The latter may be used also when a second below rod is present.

Fig. 297b shows a diagonal pole **460** which is a variant of the diagonal poles 151 or 152 (fig. 59b, examples 1, 2, 3), with two front rods **461** and three rear rods **462** of steel. And separate of this also here illustrated, said diagonal pole 460 with a second rear stop **463**. Also any different diagonal poles 153 to 158 may be performed in this way. (Two of said poles 460 with two stops 188 and 463 are shown in erected condition in fig. 354a.)

Fig. 298b and 299e show a single ball-joint **464** fixedly connected with the thin rod 185 by means of press **465**, provided with an outer large notch **466**. Said single ball-joint 464 is also a stop 188 on the diagonal pole **467** and used instead of the double ball-joint 186. The inner details of said single ball-joint 464 are like the latter, shown in fig. 67e.

In the figs. 300b to 303b, both symmetric forks **469** and **470** are used in one frame (not shown) and illustrated in the figs. 302b and 303b. They are each provided with spherical oblique front joinings **471**, **472**, middle joinings **473**, **474** and rear joinings **475**, **476** and are variants of the two equal lateral forks 177 (figs. 60d, 61d, or similar forks 217, 219 or 220. With the symmetric forks 469 and 470, the diagonal poles 151,152 and similar 153,154; 155,156 or 157,158 are each not equal, but symmetric. The advantage is, that the front pole 161 to 169 can be easily attached, because less bent and stressed during the mounting. But the disadvantage is, that in the beginning of mounting operation in fig. 82 attention is necessary to the right position of both different symmetric poles.

Fig. 305b shows a long-hole **477** (with wide **w**) which is the shape of the front joining 205 of the lateral fork 177 (figs. 60d, 61d) in the cross section R-R, or any different fork 217, 219 or 220. By this, lower bending and stressing as well as somewhat easier mounting result at the front poles 161, 162, 163 or any similar front pole 167, 168, 169, or 170.

The figs. 307d to 309d show the plug-joining 174 between the rods **478** and **479** from glass fibre (or similar synthetic material) of different diameters by means of a reduction hull **480**, fixed especially at the thicker rod 479 by press.

#### Special Diagonal Poles

In the figs. 313b and 313k, the diagonal pole **481** (of two equal diagonal poles in one frame) or 153, 154 (fig. 130a, examples 4, 5, 6) is a variant of the equal diagonal poles 151, 152 (fig. 59b, examples 1, 2, 3). The diagonal pole 481 is here without any ball-joint 168. It is provided with an upper fork **482** and a below fork **483**. They are connected by means a movable stronger intermediate rod **484** provided with each two larger cross holes **485** and **486** (or long holes). The forks 482, 483 are provided with small cross holes **487**, **488**, in which two pins **489** and **490** (more exactly clamping sleeves, or similar parts) are fixedly pressed, which catch each in the said each two larger holes 485, 486 of said both forks 482, 483, thus with twist play, as visible in fig. 320e. These and said intermediate rod **484** form together a **fork-assembly 495** as shown in fig. 314d. The front, middle, rear and below joining 205, 206, 207 and 208 exist basically as already described.

The following advantages result: First, both diagonal poles 481 are equal, thus no change by mistake is possible during the mounting. Second, by the play between the pins 489 or 490 and the larger cross holes 485 or 486 each front joining 205 is swivelling to the rear joining 207 and get the desired position to inside (see fig. 311a) similar as gained by the symmetric forks 469 and 470 (see figs. 302b and 303b). Third, the diagonal pole 481 is less bent and stressed when mounted by the higher position of its rear joining 207 (see fig. 310a) and its rear above shape becomes better. Forth, the cover tent 31 is above better supported by the frame 11, 12, 13 (see figs. 323a, 324a and 325a). In spite of this advantages, the front joining 205 remains in its former height, consequently the front pole 161 can do its action as before.

Fig. 315b shows the required new middle pole **497**, composed of the middle rod **498** and both lateral stronger rods **499**, which is illustrated in mounted condition in fig. 312a (in different scale) in the tent 1.

Figs. 318b and 318k show a diagonal pole **504** which is a variant of the equal diagonal poles 155 and 156 (fig. 147b, examples 7, 7SP, 8). It is now provided with a stronger curved (or angular) rod **506**, fixedly connected with a reinforcement hull **507** by means of a small pin **508** (or by press). Rod 506 and hull 507 are movable mounted in the rear joining 207 (now almost vertically directed)

and swivelling connected with the lateral fork **509** by means of a pin **510** fixed in two small cross holes **511** of it, similar as shown in fig. 320e. Said pin 510 is catching with play in two larger holes **512** of the curved rod 506 and the reinforcement hull 507. The latter and the curved rod 506 form together a **fork-assembly 514** as shown in fig. 319d. Also with the mentioned four advantages by the curved rod 506 swivelling placed, as to seen in the figs. 316a, 317a as well as 326a, 327a, 328a.

The similar performed diagonal pole **518** in fig. 321b is a variant of the equal diagonal poles 157 and 158 (fig. 171b, example 9) and is in erected condition shown in fig. 329a.

The next similar performed diagonal pole **519** in fig. 322b is a variant of the equal diagonal poles 159 and 160 (186b, example 10) and is erected shown in fig. 330a.

#### Self-stressing Forks

In the following drawings of symmetric forks, only the before fork respectively fork-assembly is completely shown. ("Before" means: In side view of the tent before the interior.) It and its component parts are provided with an even number. Any behind fork, forks-assembly or its component parts are provided with the next uneven number. ("Behind" means behind the interior.) If their pictures are not shown, their numbers are written in parentheses at the illustrated picture of said before fork, fork-assembly or part.

In the figs. 337d to 345d, the self-stressing symmetric forks **521** (before, also in section D-D in fig. 343d shown) and **522** (behind) are variants of the equal lateral forks 177 in the diagonal poles 151, 152 (figs. 59d, 61d, examples 1, 2, 3), which are now differently performed, because symmetric. Said symmetric forks 521 or 522 are each composed of a symmetric fork-body **523** or **524**, a swivelling front joining **525** or **526** mounted at a bolt **527** or **528** which is secured by means of a cotter **529**. Said both symmetric forks 521, 522 are each provided with a under stop-nose **530** and an upper stop-nose **531** and are spherical oblique placed in holes **533** or **534** with the imagined axles **A-A** or **B-B**. Consequently in the under position the front joinings 525 and 526 (fig. 337d) are directed inside as shown in the figs. 332a, 334a, 338d and 339d. Therefore, the front pole 161 (as well as 162, 163) can easily be attached as shown in the fig. 333a and 343a during the mounting operation. (Because it disappears to push strongly inside the front joinings 205 of the lateral forks 177 as described for the mounting operation to fig. 86. But the ends of the front pole 161 have to be pushed together, which is easily be done.)

Now said front pole 161 is lifted by hand as the arrow **L** shows in fig. 333a, so that both front joinings 525 and 526 get the upper position like fig. 340d. And seen from the top on the figs. 341d and 342d, both front joinings 525 and 526 are moving to outside (by the sloping axles **A-A** and **B-B**). As the result of this, the frame 11 (as well as similar 12, 13) becomes completely stressed (as also illustrates in the figs. 39b, 71b and 72b in different scale). The front pole 161 is permanently held in its upper position by means of the stressing front top strings 101 and 102.

Also the different lateral forks 217 or similar 219, 220 (figs. 150d, 174d, 189d, examples 7, 8; 9; 10) without any middle joining 206 are performed as previously described and shown in figs. 346d and 347d for the behind fork-assembly **537** (and symmetric behind fork-assembly **538**, not shown).

In the figs. 348d and 349d (examples 1, 2, 3), the shown before fork-assembly **541** (or its symmetric behind fork-assembly **542** not shown) is a combination of the equal fork-assembly 495 (fig. 314d) and both self-stressing symmetric forks 521 and 522 (figs. 337 to 345). They are each provided with a upper fork **543** and a under fork-body **545** - (or **546**), above with the middle joining 206 and the rear joining 207, down with the below joining 208. All parts are fixedly united by a rod **547** and fixed pins **548**, **549**. In the under fork-body 545 (or 546), the bolt 527 (or 528) is mounted together with the swivelling front joining 525 (or 526). (The said fork-bodies 545 or 546 may be also performed in any different manner.)

As previously described (to the self-stressing forks 521, 522), the front pole 161 (as well as 162, 163) can easily be mounted and the frame 11, 12, 13 and is automatically stressed.

As also previously described (to the fork-assembly 495) the diagonal poles are less bent and stressed (see fig. 310a) and the rear above shape and the support of the cover tent 31, 32, 33 becomes better (see figs. 323a, 324a and 325a). The front joinings 525 (or 526) remain in their the same height as the former front joining 205.

Fig. 350 shows the upper part of the fork-assembly 541 (or 542) of fig. 349d as well as the upper part of the fork-assembly 495 of fig. 314d differently performed by welding or hard soldering. Both fixed pins **550** are used to stop the ends of the next rods when mounted.

In the figs. 351d and 352d (examples 7, 8 or similar 9, 10), the shown before fork-assembly **551** (or its behind symmetric fork-assembly **552**, which is not shown) are a combination of the equal fork-assembly 514 (fig. 319d) and both self-stressing symmetric fork-assemblies 537 and 538 (figs. 346d and 347d). Each a stronger curved rod 506 (with the not shown rear joining 207 at its rear top end)

is now fixedly connected with the fork-body **553** (or **554**) by means of two fixed small pins **556** (or by press). Said fork-bodies 553 (or 554) are provided with each a oblique bolt 527 (or 528), on which the swivelling front joining 525 (or 526) is mounted.

As similar previously described (to the self-stressing forks 521, 522), the front pole 167, 168 (as well as 169, 170 can easily be mounted and the frame 17, 18 (as well as 19, 20) is automatically stressed.

As also previously described (to the fork-assembly 514) the diagonal poles are less bent and stressed (see fig. 316a) and the rear above shape and the support of the cover tent 37, 38 becomes better (see figs. 326a to 330a). The front joinings 525 (or 526) remain in their former height.

#### Variants of Connections

The fig. 353a shows an inner tent 21 provided with two top long loops **558** and two rear long loops **559** for the connection with the diagonal poles 151, 152 having not any stop 188.

In fig. 354a, there are two front normal stops 188 and additional rear stops 463 at both diagonal poles 460 as shown in fig. 297b in unstressed straight condition. By said rear stops 463 an exact position of the rear top bands 107, 108 results. (For examples 1, 2, 3 shown, also in different examples 7 to 10 possible.)

In the figs. 355a and 356a, the top and rear snap hooks 123, 124 are connected by each an additional cross string **561**, **562** or **563**. By these, a more exact position of the rear part of the frame 11, 12, 13 (or similar 17 to 20) results.

In fig 357a, the diagonal poles 464 are provided with the single ball-joint 464 (see fig. 299e). In their large notches 466 is mounted the connection rod **565**. The latter is provided with four teeth **566** for attaching, as shown in fig. 358a. The connection rod 565 supports also the cover tent 31, 32 or 33.

Fig. 359d shows the several snap hooks 123, 124 or 125 as previously illustrated in several drawings. Instead of them, differently performed connection parts **570** may be used, as for example a different snap hook **571** (fig. 360d), snap hook of plastic **572** (fig. 361d), hook **573** (fig. 362d), hook **574** and eye **575** (fig. 363d), burr bands **576**, **577** - (fig. 364d), band **578** (fig. 365), or ring **579** (fig. 366d).

In the figs. 367a, 368d and 369d, the inner tent 21 (or perhaps 27, 29) is provided in front below with two short strings **584** and two small pegs **585** especially of plastic. The latter are used at the beginning of mounting operation in fig. 40d for the securing of the front ends of the diagonal poles 151, 152 (instead of any cross mounted tent nail

395 shown there), attached in the cross holes 203 (see figs. 62d, 63d).

Different ways of this securing of the front end of the diagonal poles for the mounting are also illustrated in:

Figs. 370d and 371d show each front end of the diagonal poles 151, 152 (or 155, 156) provided with a hook **589** which is hung for securing in the semicircle eye 134.

In the figs. 372e and 373e, the front below flaps 127, 128 of the inner tent 21 are without any hole 131, but each provided with a gap **591**. Each front end of the diagonal poles 151, 152 is without any pin 201. The securing is made by said gaps **591** together with the already existing front snap hooks 125 in half height shown in fig. 41d (examples 1, 2, 3)

Fig. 374a illustrates a tent **595** which is a combination of the tents 7SP and 9. The belonging fig. 375a shows - as also possible - only one front top string 100 existing between the front pole 167 and the inner tent 27, because the below front strings 103, 104 are hung (like example 9) in the diagonal poles 155, 156. Here only a very small number of strings and bands have to be mounted.

#### Variants of Tents

Fig. 376a shows an inner tent **601** (a variant of the inner tent 21, fig. 96, or similar 27, 29) provided with an inner partition wall **602**, two zippers **603**, **604**, and therefore two separate interiors **605**, **606** as well as entries **607**, **608**.

Fig. 377 shows a tent **611** (a variant of the tent 1) provided with a sloping front wall **612** as well as a sloping front entry **613**. Therefore, its below front under space is larger than in the tent 1.

Fig. 378 shows a trapezoid tent bottom **614** (a variant of the tent bottom 86), with smaller rear size, for in front broad tents especially 1, 2, 3, but also possible for tents 7 to 10.

Fig. 379 shows a tent **615** (a variant of the example 7SP) with the middle front rod 307 placed inside, thus with about vertical front wall **616** and entry **617**. Therefore, with more space in front inside.

Fig. 380 shows a simplified tent **625** (a variant of example 7SP) without any middle front rod 307.

Figs. 381 to 384 show simplified tents **631**, **637**, **639**, **640** (variants of the tents 1, 7, 9, 10) without any front lateral rods 263, 264. Their front complete cross rod **641** especially of steel is illustrated in fig. 385b.

#### Storm ropes

The storm ropes **642**, **643**, **644**, **645**, **646** and **647** shown in the figs. 386a to 369a as well as **648**,

**649** in fig. 388a are normally not used, only in case of heavy wind or storm. They are each connected with the frame 1 to 10 (examples 1 to 10 as well as 11 to 16) through the rain-protected holes **651**, **652** (in the cover tent 31 to 40), shown in the figs. 390d, 391d. The said usual variable storm ropes **642** to **649** are each provided with a hook **644** which is hung at a step **655** (fig. 390d) of the frame 11 to 20, or in the lateral fork 177, 217 (fig. 391d), 219 or 220, or in the eyes 260 of the angle pieces 257, 258 or 305 (about shown in figs. 386a, 389a), or in eyes **657** on the cover tent 32 (fig. 387a), 33 (fig. 388a), 38. The connection is similar in the tents 8 to 10 here not shown.

Fig. 386a shows also the case of stressing the front roof 340 by means of the storm ropes **642**, **643**. Thus without both front lateral rods 263, 264 now not present. This is possible in the tents 1, 7, 9, 10. Also it is possible similar in the example 7SP without the middle front rod 307 for its front roof 356. (Also possible in the examples 11, 12, 13)

#### EXAMPLES 11 TO 16 WITH RING-POLE

The already previously described examples 1 to 9 are well suited for the tents 1 to 9 having large height, but allow only an about square tent bottom 85. Thus especially having good space for a couple, or for 3 people.

The subsequently described examples 11, 12, 13, 14 and 15 but allow broad and high tents especially for a family.

Every tent **711**, **712**, **713**, **714**, **715** or **716** of the examples 11, 12, 13, 14, 15 and 16 shown in the figs. 392 to 487a is composed of a frame **721**, **722**, **723**, **724**, **725** or **726**, an inner tent **731**, **732**, **733**, **734**, **735** or **736**, and a cover tent **741**, **742**, **743**, **744** or a complete cover tent **745**, **746**. A rectangle tent bottom **751** is in the tents 711 and 714.

As shown in the figs. 431a, 445, 475 and 487, the tents 712, 713 (optional), 715, 716 of the examples 12, (13), 15, 16 are provided at its tent bottom **752**, **753**, **755**, **756** with a fifth middle back corner **765** or with fifth and sixth back corner **775** and **776**.

In example 14, the cover tent 744 is provided with a vertical front entry **784** semicircle above, shown in fig. 454a. (Or any different sloping front entry.)

Only details are subsequently described if differently performed than tent 1 (thus different than example 1).

#### Inner tents

The inner tents 731, 732, 733, 734, 735 and 736 are similar performed as the inner tent 21 (example 1) shown in fig. 100a (there without any

connection parts) and in fig. 101a (there with connection parts). But they are provided in the rear also with the hooks 122 as there already used in front. (Perhaps also different connections parts 570 may be used, as shown in the figs. 360d to 363d.)

The inner tents 731, 732 and 734 (examples 11, 12 and 14) are without any four vertical bands 116, 117, 118, 119.

The inner tents 733, 735, 736 may be provided with an inner partition wall 602, and consequently two separate interiors 605 and 606 as shown in fig. 376a.

#### Example 11

In the tent 711 of example 11, the front projecting range 234, both lateral forks **801** and **802** - (outside with both front lower sections 176), both front top sections 178, the crossing-rod **810** and perhaps both front below sections 176 form together a ring-pole **811**, hold together by means of the continuous stressing elastic **812** inside. Separate of it, both rear top sections 179 and both rear lower sections 180 form two equal rear poles **815** and **816**, connected by each a stressing elastic **817**.

The ring-pole 811, both rear poles 815 and 816 as well as the lateral front rods 263, 264 result the frame 721. Its similar component parts are already previously described besides as mentioned subsequently:

As to seen in the figs. 404d as well as 412a, the joinings 205, 207 and 208 of the lateral fork 801, 802 are placed in the angles of the ring-pole 811.

The mentioned additional crossing-rod 810, shown in the figs. 419d to 421d, is composed of: A centre cross rod **820** and two symmetric top forks **821** and **822**, connected by means of two screws 259. Each top fork 821 or 822 is provided with a front joining **824**, a rear joining **825**, an inner joining **826**, and perhaps a lateral eye **827**. (As optionally shown in fig. 422b, the crossing-rod 810 may be also performed as one piece especially of steel. Then the inner joinings 826 disappear.)

In the top forks 821 and 822, the holes **830** of both rear joinings 825 are provided with an inner thread **831**. At the front ends of both rear poles 815 and 816, each fixed plug **832** is provided with the same outer thread **833** for the attaching at the top forks 821 or 822. (Instead of the threads 831 and 832, any different suited detachable connection may be used. Or for cheap tents without any safe connection.)

It is to understand, that the frame 721 may also be performed in different ways: For any smaller tents, the ring-pole 811 and the rear poles 815 and 816 may be connected permanently together. Or

for any larger tents, both front lower sections 176 may be separated from the ring-pole 811, and connected in the beginning of mounting operation. Or only their each lowest rod 199 may be separated.

#### Frame example 12

The tent 712 of example 12 is similar the tent 711 (example 11), but provided in front only with one middle angle piece 305 similar the tent 71 (example 7SP). Instead with the crossing-rod 810, it is provided with a crossing-piece **834** with the four joinings 824 and 825, and with an additional fifth middle back joining **835**. In the latter an additional middle back pole **836** is attached to the fifth middle back corner 765 of the tent bottom 752.

The inner tent 732 may be fixed at the top of the frame 722 next the crossing-piece 834, or at it in different ways: Either both lateral eyes 827 may exist as already described. Or as shown in fig. 431b, only one top centre eye **837** with a hook 122 exists for a single centre band **838** from the centre corner **839** of the inner tent 732. The frame 712 is similar example 16. Its crossing-piece 834 is there exactly shown in fig. 478d.

#### Frame example 13

The tent 713 of example 13 is similar the tent 711 (example 11), but provided with an additional middle pole **840** similar the front pole 168, and its lateral equal (or symmetric) forks **841** and **842** of the ring-pole **843** are each provided with an additional middle joining 206, as shown in the fig. 442d.

In fig. 445 is shown a variant of example 13 with an additional middle back pole 836 attached to the middle back corner 765 of the tent bottom 753. This middle rear back pole 836 is connected with the crossing-rod 810 by means of the middle back joining 835.

#### Frame example 14

The tent 714 of example 14 is similar tent 711 (example 11), but its ring-pole **844** is differently performed, as shown in fig. 461a: The here shorter front projecting range 234 is provided in the middle with a angular (or curved) front cross rod **854**.

The ring-pole 844 can be collapsed (fig. 461c), because the total number of its inner rods is an even number.

As the result of this short front shape of the ring-pole 844, the inner tent 734 is high, but the anteroom **855** is small, for a light tent 714.

### Mounting of ex. 11

(Similar also examples 12, 13, 14)

As shown in the figs. 423a, 424a and 425a, in the beginning of mounting operation for the tent 711 of example 11, the inner tent 731 is spread on the ground and fixed by means of four tent nails 395. Each front end **857** of both rear poles 815, 816 are attached at the ring-pole 811 by means of the threads 831 and 833. The behind pin 197 of the ring-pole 811 is put in the hole 131 of the front behind flap 128 on the corner 73 of the tent bottom 751. Then the before end **858** of the ring-pole 811 is pushed in cross direction of the arrow **C** to the front before corner 72 of the tent bottom 751. The before pin 201 is now put in the hole 131 of the front before flap 127, and the ring-pole 811 is now stressed by hand as shown in fig. 426a.

Then at first the hooks 122 of the above main bands 105 and 106 are hung in both lateral eyes 827 of the crossing-rod 810 (fig. 405b). Now the frame 721 is completely connected by means of several hooks 122 (fig. 406b) with the inner tent 731 which is stressed by this, as fig. 428a shows.

Now the cover tent 741 and the front lateral rods 263, 264 as well as tent nails 395 in front are mounted for the erected tent 711 of fig. 429a.

As to see, the mounting operation can easily and quickly be done by one single person despite the large size of the tent 711.

The connection may be made also without any two lateral eyes 827: Then the hooks 122 of the above main bands 105 and 106 are hung in the frame 721 beside the crossing-rod 810.

As illustrated in fig. 396a, two additional strings **860** (dash-dotted shown) may exist for the support of the cover tent 741.

The mounting of tent the tents 712 and 714 (examples 12, 14) is similar.

During the mounting of tent 713 (example 13), the additional middle pole 840 has be attached in fig. 427a.

### Example 15

As shown in the figs. 464a to 471a, the frame 725 of the example 15 is separated in a front pole **861**, an angular pole **862**, two rear poles 815, 816, two back poles **865**, **866**, and a middle pole 171. Their component parts are similar as in example 11 (figs. 408k, 409k, 419d) and example 13 (figs. 442d, 447a) already shown and there described, with the following exceptions:

In fig. 464a, here the front pole 861 is similar the front pole 162 (ex. 2, fig. 116a). In it is present the front projecting range 234

In fig. 465k, in the angular pole 862, the crossing-rod **870** is provided with two top forks **871**, **872**

with each an additional back joining **873**, visible in fig. 466d. In the angular pole 862 are present both front lower sections 176, the lateral forks 841, 842, both front top sections 178, the crossing-rod 870, and the stressing elastic **874** with two plugs 200 at the end.

In the figs. 469a and 470a, the back poles 865, 866 are like the rear poles 815, 816. (Perhaps they may be shorter.)

As the result of the four rear and back poles (815, 816; 885, 886), the complete cover tent 745 is well supported in the back. Consequently said poles (815, 816; 885, 886) may be performed with rods 192, 193, 194 of normal diameter, thus not stronger.

Like example 2, the complete cover tent 745 is here separated in an "open cover tent" **875** and an front tent **885**.

In the beginning of mounting operation, the front pole 861 is shoved in the top loop 60 of the "open cover tent" 875, which is spread on the ground as shown in fig 472a. As also there illustrated, the front pole 861 is then connected with the angular pole 862. The result is the ring-pole **895**.

The following mounting operation is similar as illustrated for the example 11 in the figs. 423a to 429a. The result is the open tent **905** in fig. 473a, similar the open tent 52 of example 2.

Under cold weather, the open tent 905 is closed by the front tent 885 to the (complete) tent 715, as shown in fig. 474a.

Possible variants of example 15: With only one middle back pole 835. Without the middle pole 171.

### Example 16

As shown in the figs. 476a to 483a, the frame 726 of the example 16 is similar example 15 and separated in a front pole **911**, an angular pole **912**, two rear poles 815, 816, one middle back pole 836, a middle pole **913**, and the second frame 173 (from example 3, fig. 123a as well as 122a). Their component parts are similar as in example 15 with the following exceptions:

In fig. 476a, here the front pole 911 is similar the front pole 163 (ex. 3, fig. 116a). In it is present the front projecting range 234.

In fig. 477k, the angular pole 912 is here provided with the crossing-piece 834 with four joinings 824, 825 and a middle rear joining 835.

Like example 3, the complete cover tent 746 is here separated in an "open cover tent" **916** and an front tent **926**.

In the beginning of mounting operation, the front pole 911 is shoved in the top loop 60 of the "open cover tent" 916 as shown in fig. 484a. As

also shown there, the front pole 911 is then connected with the angular pole 912. The result is the ring-pole **936**.

The following mounting operation is similar as illustrated for the example 11 in the figs. 423a to 429a. The result is the open tent **946** in fig. 485a, similar the open tent 53 of example 3. As there shown in the figs. 94a and 96a, as well as here in fig. 486a, the second frame 173 and the front tent 926 can be attached for the (complete) tent 716.

In optional embodiment of fig. 476a, the front pole 911 may be separated in two half poles **951** and **952**. Then the front projecting range 234 is divided in two sections **953** and **954**. The half pole 951 consists of the rods 299, 301, 303 as well as a stressing elastic and two stoppers. The other half pole 951 is composed of the rods 300, 302 and 304 with the middle angle piece 305, as well as a stressing elastic and two stoppers.

As the result of this, in fig. 484a the mounting of the straight two half poles 951 and 952 in the front top loop 60 of the front tent 916 is easier.

#### TENT IN CAR

As shown in the figs. 488a and 489a, each collapsed tent 1 to 10 or 711 to 716 may be packed in each three separate bags (not shown) for the frame 11 to 20 or 721 to 725, the inner tent 21 to 30 or 731 to 736, and the cover tent 31 to 40 or 741 to 746, which are stowed away in the car **960** in different areas hatched drawn, thus in lateral areas **961**, **962** behind the rear wheels **963**, **964**, or in the area **965** under the seat **966**, as well as in the free area **967** under the luggage room **968**. The advantage is, that the tent in accordance with the invention is now filed in spaces normally not well used for the luggage. Here the tent 1 to 10 or 711 to 716 does not take a lot of room like when as usual be packed in one big bag.

#### DIFFERENT EMBODIMENTS NOT SHOWN

Any combinations of the shown examples of tents, frames, inner tents, entries or other parts are possible.

The entries or the ventilation may be performed or locked differently than shown. Any window, inner pocket or additional rear entry may exist. The shown entries, air holes or any window may be provided with mosquito nets and additional zippers for said nets.

The number or strength of the rods in any poles may be differently than illustrated in the enclosed drawings, if the rods having any different length or the tent having any different size. The rod at the end of any pole may be performed in shorter or conical shape, or may be composed of two rods

with different diameters fixed together permanently. Rods may be connected by means of hinges or similar suited connections instead of the mentioned elastic.

5 The angle between the joinings may be different than shown in any fork, any angle piece, any middle piece, or any curved rod or instead of it in any angular rod.

10 Hooks and eyes may be arranged inversely.

The scope of this invention is given by the patent claims. Therefore, also lower tents, in which a person cannot stand, correspond with the patent claims.

15 Further changes or modifications may be made without departing of the spirit of this invention and the scope of the claims. Therefore it is to be understood that the present embodiments and drawings are only examples of the possible configurations.

20

#### INDUSTRIAL OR TRADE APPLICABILITY

25 The "tents with frame" of this invention are useful especially for camping or military, as well as for storage, beach cabana, garage, or warmhouse, especially the latter with the cover tent and the inner tent of transparent or translucent sheet material.

30 Referenced cited:

British patent specification GB 1033820  
German patent application DE 3820725 A1 (inventor myself)  
35 European patent application EP 0401398 A1 (inventor and applicant myself)  
(The latter European patent application is like my International patent application WO 90-15209)

#### 40 Claims

1. Collapsible tent (1 to 10, 71, 711 to 716) with frame (11 to 20, 70, 721 to 726), inner tent (21, 27, 29, 30, 731 to 736) and at least one cover tent (31 to 40, 69, 741 to 746), especially for a small number of people,  
45 **at which** said inner tent (21, 27, 29, 30, 731 to 736) and said at least partially elastic frame (11 to 20, 70, 721 to 726) is so performed and detachable connected with each other, that they are stressed against one another,  
50 **and said frame** (11 to 20, 70, 721 to 726) consists at least of two lateral forks (177, 217, 219, 220; 801, 802; 841, 842), at these adjacent a front projecting range (234) oblique front above, at said lateral forks (177, 217, 219, 220; 801, 802; 841, 842) adjacent each a front top section (178) oblique to the rear above, at that  
55

adjacent each a rear top section (179), and at that adjacent each a rear lower section (180), and at said lateral forks (177) adjacent each a front lower section (176), the latter consisting at least of one rod (198, 199; 458); at which the lateral forks (177, 217, 219, 220; 801, 802; 841, 842) are provided with at least each two joinings (205, 206, 207, 208),

**and whose inner tent** (21, 27, 29, 30, 731 to 736) is preferably provided with a tent bottom (86, 751, 752, 753, 755, 756) with at least four below corners (72, 73, 74, 75; 765; 775, 756),

**and whose cover tent** (31 to 40, 69, 741 to 746) lies on the frame (11 to 20, 70, 721 to 726) which is arched at least partially,

**characterized in that**

**the inner tent** (21, 27, 29, 30, 731 to 736) is provided with a plane front area (87, 98) with at least an inner entry (141, 147, 149, 150; 607, 608), and in front above with at least one front top corner (76; 83, 84) the latter with at least one front top string (100; 101, 102) or band directed to the front, which is connected especially by means of hooks (122) directly or indirectly with the front projecting range (234) of the frame (11 to 20, 70, 721 to 726),

**and the frame** (11 to 20, 70, 721 to 726) is composed of several rods (183, 184, 185, 189, 190, 191, 192, 193, 194, 198, 199; 239, 240, 241, 242, 243, 244, 250; 251; 299, 300, 301, 302, 303, 304; 458, 820) with different strengths, which are detachably connected by means of plug-joinings (174, 175) or by any different manner, at which the rods (183, 198; 239, 240; 275, 276; 299, 300) beside the lateral forks (177, 217, 219, 220; 801, 802; 841, 842) have a larger strength than the most different rods,

**at which** in preferred embodiment also the rods (192, 193, 194) in the rear lower section (180) have a larger strength than the most different rods.

(For ex. 1 to 16, 7SP, see figs. 39b, 52b, 59b, 71b, 100a, 101a, 109a, 141a, 142a, 167a, 168a, 396a, 407a)

2. Collapsible tent (1 to 10, 71) with frame (11 to 20, 70), inner tent (21, 27, 29, 30) and at least one cover tent (31 to 40, 69), especially for a small number of people,

**at which** said inner tent (21, 27, 29, 30) and said frame (11 to 20, 70) are detachably connected with each other, and stressed against one another,

**and said frame** (11 to 20, 70) consists at least of two lateral forks (177, 217, 219, 220), at these adjacent a front projecting range (234) oblique to front above, at said lateral forks

(177, 217, 219, 220) adjacent each a front top section (178) oblique to the rear above, at that adjacent each a rear top section (179), and at that adjacent each a rear lower section (180), and at said lateral forks (177, 217, 219, 220) adjacent each a front lower section (176),

**characterized in**

**that the frame** (11 to 20, 70), in the collapsed condition of the tent (1 to 10, 71),

**is separated in** a front pole (161, 162, 163, 167, 168, 169, 170, 290) consisting of the front projecting range (234);

**and separate from it two diagonal poles -** (151, 152; 153, 154; 155, 156; 157, 158; 159, 160) each composed of a lateral fork (177, 217, 219, 220), a front lower section (176), a front top section (178), a rear top section (179) and a rear lower section (180); at which their rods (183, 184, 185, 189, 190, 191, 192, 193, 194, 198, 199) each are hold inside together especially by means of a stressing elastic (195),

**at which the front joining** (205) of each lateral fork (177, 217, 219, 220) has a larger clearance than the different plug-joinings (174, 175),

**and said both diagonal poles** (151 to 160) are provided **before** their crossing point **C** with at least each a stop (188), which may be performed as a ball-joint (186, 464),

**and the inner tent** (21, 27, 29, 30) is above provided with at least a front top corner (76) or two centre top corners (81, 82) with two top main-bands (105, 106), which are hung by means of top snap hooks (123) or different connection parts (570) in the diagonal poles (151, 152; 153, 154; 155, 156; 157, 158; 159, 160) before their stops (188), and said inner tent (21, 27, 29, 30) is also provided with at least two rear top corners (79, 80) with two rear top bands bands (107, 108), which are hung by means of rear snap hooks (124) or different connection parts (570) in the diagonal poles (151 to 160) **behind** their crossing point **C**.

(For ex. 1 to 10, 7SP, see figs. 39b, 52b, 58d, 59b, 61d, 67e, 71b, **72b**, 78d, 80e, 81e, 141a, 142a, 148e, 299e)

3. Collapsible tent (711 to 716) with frame (721 to 726), inner tent (731 to 736) and at least one cover tent (741 to 746), especially for a small number of people,

**at which** said inner tent (731 to 736) and said frame (721 to 726) are detachably connected with each other, and stressed against one another,

**and said frame** (721 to 726) consists of at

least of two lateral forks (801, 802; 881, 842), at these adjacent a front projecting range (234) oblique to front above, at said lateral forks (801, 802; 881, 842) adjacent each a front top section (178) oblique to the rear above, at that adjacent each a rear top section (179), and at that adjacent each a rear lower section (180), and at said lateral forks (801, 802; 881, 842) adjacent each a front lower (176) section;

**characterized in**

**that in the beginning of mounting operation** of the tent (711 to 716) a **ring-pole** (811, 843, 844, 895, 936) exists,

in which is present in the shape of a ring at least the front projecting range (234), both lateral forks (801, 802; 841, 842), both front top sections (178),

and a crossing-piece (834) with at least four joinings (824, 825), or five joinings (824, 825; 835), which may be connected by means of a centre cross rod (820), so that a crossing-rod (810, 870) exists, perhaps with six joinings (834, 835, 837);

**and the inner tent** (731 to 736) in preferred embodiment is provided with at least a top centre corner (81, 82; 839) and a centre band (838) or two main bands (105, 106), which are hung by means of hooks (122) or different connection parts (570) in eyes (827, 837) at the crossing-piece (834) or at the crossing-rod (810, 870), or beside them at the frame (721 to 726); and further top strings (100; 101, 102) and especially hooks (122) are present between inner tent (731 to 736) and frame (721 to 726).

(For ex. 11 to 16, see especially fig. 407a und 472a)

4. Tent (1 to 6, 713, 715, 716) with frame (11 to 13, 723, 725, 726), inner tent (21, 733, 735, 736) and at least one cover tent (31 to 33, 743, 745, 746), according to the claims 1, 2 or 3, **characterized in that at the frame** (11 to 13, 723, 725, 726) its lateral forks (177; 841, 842) are provided above with each an additional middle joining (206), in which an additional collapsible middle pole (171, 840) is detachably mounted, and the cover tent (31 to 33, 743, 745, 746) lies on the latter, **and the inner tent** (21, 733, 735, 736) is provided at the front top and below corners (77, 78, 83, 84) with about vertical bands (116, 117, 118, 119), which are hung especially by means of hooks (122) in the middle pole (171, 840), **at which** in preferred embodiment its inner entry (141) is about vertically arranged and has above a semicircle shape, and in preferred

embodiment **the frame** (11 to 13, 723, 725, 726) in front below is provided with two fixed plugs (200) with pin (201), head (202) and cross hole (203), the latter suited for a tent nail (395) or any different small peg (585), or any different installation to safe the position of said frame (11 to 13, 723, 725, 726) in the front below corners (72, 73) of the inner tent (21, 733, 735, 736).

(For ex. 1 to 6, 13, 15, 16, see figs. 39b, 40d, 59b, 61d, 62d, 68b, 91a, 93a, 94a, 109a, 131, 132, 133, 433a, 446d, 464a, 473a, 482a, 485a, further 367a to 373e)

5. Tent (2, 3, 5, 6, 8, 715, 716) with frame (12, 13, 18, 725, 726), inner tent (21, 27, 735, 736) and at least one cover tent (32, 33, 38, 745, 746), according to the claims 1, 2 or 3,

**characterized in that** said cover tent (32, 33, 38, 745, 746) is now a complete cover tent composed of an in front "open cover tent" (62, 63, 68, 875, 916) and a front tent (42, 43, 48, 885, 926) detachable connected especially by means of at least a zipper (59) also serving as an outer entry (412, 413),

**and** consequently the tent (2, 3, 5, 6, 8, 715, 716) without said front tent (42, 43, 48, 885, 926) is an open tent (52, 53, 58, 905, 946) which can be used alone, and said "open cover tent" (62, 63, 68, 875, 916) is provided in front below especially with two lateral triangles (371, 372) with burr-bands (373) for the attaching at the frame (12, 13, 18, 725, 726), and with some (semicircle) eyes (375) for the connection of the front strings (101, 102, 103, 104), and with a front top loop (60) for the front pole (162, 163, 168, 861, 911),

and in four of said tents (2, 5, 8 or 15) the front pole (162, 168, 861) is composed of straight rods (275, 276, 279, 280, 281, 282) in preferred embodiment with at least one curved rod or angular rod (283) in the middle.

(For ex. 2, 3, 5, 6, 8, 14, 15, see figs. 93a, 94a, 97e, 112b, 113a, 115a, 116b, 121a, 132, 133, 136a, 163a, 488a)

6. Tent (3, 6, 716) with frame (13, 726), inner tent (23, 736) an at least one cover tent (33, 746) according to the claims 1, 2 or 3,

**characterized in that** a middle angle piece (305) is arranged in the front projecting range (234) respective in the front pole (163, 911),

**at which** if need a second frame (173) can be attached, which is composed of a T-piece (310) and at least a longitudinal rod (311, 312) and several lateral rods (317 to 322) which is stressed by means of a lower cross string (328), at which the front tent (43, 926) lies on

the erected second frame (173).

(For ex. 3, 6, 16, see figs. 94a, 96a, 116b, 121a, 123b, 133, 486a)

7. Tent (7 to 10, 71) with frame (17 to 20, 70) and inner tent (27, 29, 30), according to the claims 1 or 2,

**characterized in that** the inner tent (27, 29, 30) is detachably connected directly or indirectly with the front pole (167, 168, 169, 170, 290) by means of at least one string (100; 101, 102, 103, 104) and hooks (122), and with the stops (188) of the diagonal poles (155, 156; 157, 158; 159, 160) by two top main bands (105, 106),

**either** fixed at both top centre corners (81, 82) of said inner tents (27, 30),

**or** fixed at the front top corner (76) of said inner tent (29),

**and** at said inner tents (27, 29, 30) its sloping front area (87) is preferably provided with an inner entry (147, 149, 150) similar as a triangle with at least one zipper (137, 139, 140).

(For ex. 7 to 10, 7SP, see figs. 137a to 142a, 166a to 168a, 181a to 183a, 220, 375a)

8. Tent (1 to 10, 71) with frame (11 to 20, 70), inner tent (21, 27, 29, 30) and at least one cover tent (31 to 40, 69) according to the claims 1 or 2,

**characterized in that** both equal diagonal poles (481) of a said frame (11, 12, 13) are each provided with a fork-assembly (495) composed of an upper fork (482) with the middle and rear joining (206, 207), and a below fork (483) with front and below joining (205, 208), and both said forks (482, 483) are connected by means of a movable intermediate rod (484) with twist play, **especially** by means of cross placed pins (489, 490) fixed in said forks (482, 483) and catching in each two larger cross holes (485, 486) of said intermediate rod (484) with play,

**or** in the different lateral forks (217, 219, 220) in their now almost vertically arranged rear joining (207) the adjacent curved or angular rod (506) especially with a reinforcement hull (507) is mounted with twist play, for which **especially** said lateral forks (217, 219, 220) are fixedly connected with said cross placed pin (490), which catch in larger holes (512) of said next upper curved rod (506) with play, or in inverse way.

(For ex. 1 to 10, 7SP, see figs. 310a to 322b, further to 330a)

9. Tent (1 to 10, 71) with frame (11 to 20, 70), inner tent (21, 27, 29, 30) and at least one

cover tent (31 to 40, 69) according to the claims 1 or 2,

**characterized in that** the symmetric diagonal poles (161 or 162; 165 or 166; 167 or 168; 169 or 170) are provided with each a symmetric fork-assembly (521 or 542; 537 or 538; 541 or 542; 551 or 552;), composed of a fork-body (523 or 524; 545 or 546; 553 or 554) with at least two fixed joinings (206, 207, 208), and a separate swivelling front joining (525 or 526) which is mounted at said fork-body (523 or 524; 545 or 546; 553 or 554) by means of each a bolt (527 or 528) spherical sloping arranged, in this manner,

**that** said swivelling front joinings (525 or 526) are placed in their under position in oblique direction to inside front down, but when lifted during the mounting operation, in their upper position are outside from their former under position.

(For ex. 1 to 10, 7SP, see figs. 331a to 345d, also to 352d)

10. Tent (711 to 714) with frame (721 to 724), inner tent (731 to 744) and cover tent (741 to 744) according to the claims 1 or 3,

**characterized in that** the ring-pole (811, 843, 844) is composed of the front projecting range (234), the lateral forks (801, 802; 841, 842), both front top sections (178), the crossing-rod (810) or the crossing-piece (834), and in preferred embodiment also of both front lower sections (176) adjacent to outside, which all are connected to each other especially by means of an elastic (812).

(For ex. 11 to 14, see especially fig. 407a)

11. Tent (715, 716) with frame (725, 726), inner tent (735, 736) and a complete cover tent (745, 746) according to the claims 1 or 3,

**characterized in that an angular pole** (862, 912) exists, consisting of both front lower sections (176), the lateral forks (801, 802), and the crossing-rod (870) or the crossing-piece (834), which all are connected with each other by means of an elastic (874);

**and separated of it** the front projecting range (234) of the frame (725, 726) is present in the shape of a front pole (861, 911),

**at which** in preferred embodiment in the beginning of mounting operation said front pole (861, 911) is shoved in the loop (60) of the "open cover tent" (875, 916) and then it is united with the angular pole (862, 912) to the **ring-pole** (895, 936);

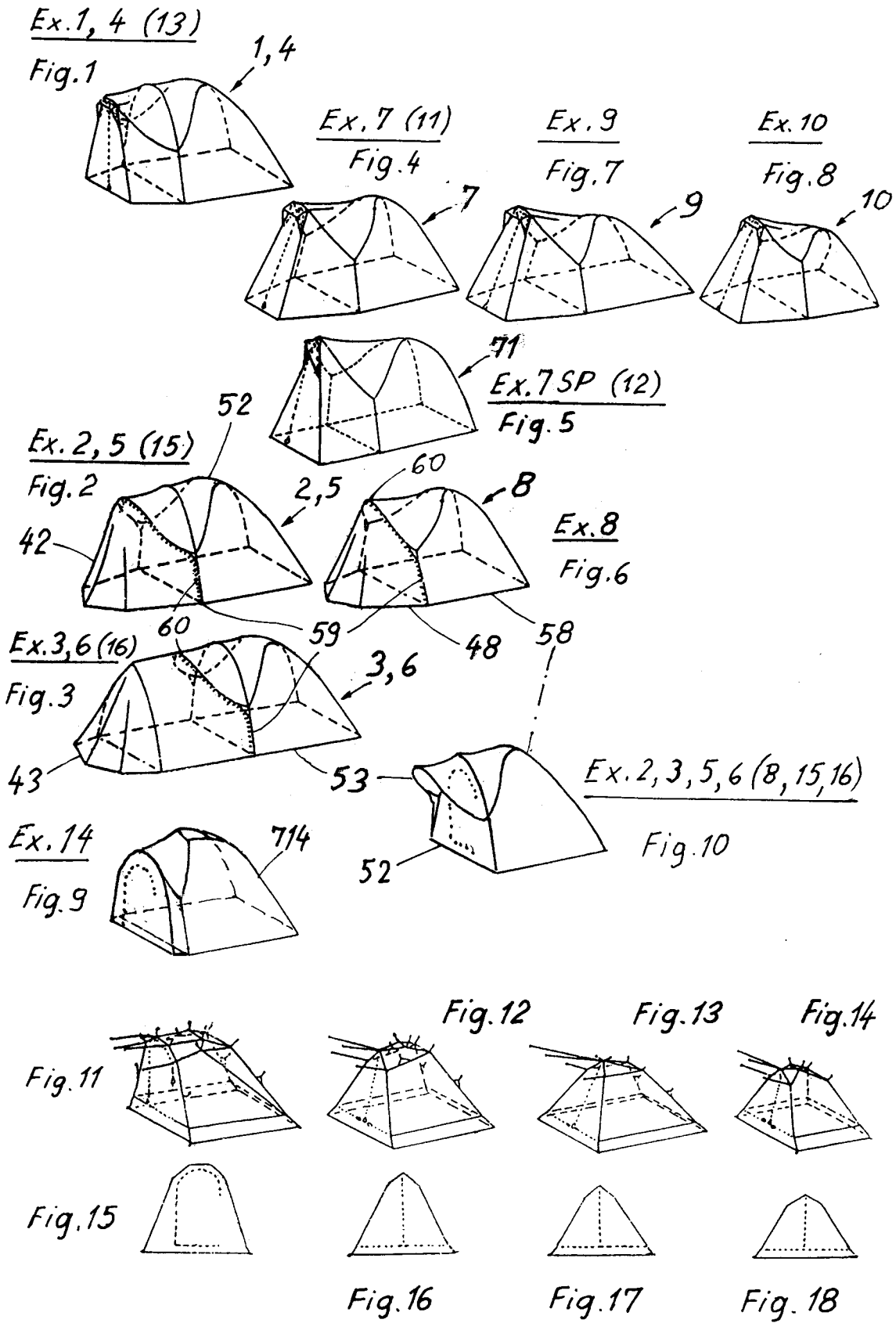
**and in optional embodiment** the front range (234) may be separated in two sections (953, 964), thus the front pole (911) may be com-

posed of two separate half poles (951, 952).  
(For ex. 15, 16, see figs. 464a to 487a, especially 464a, 465a, 472a as well as 484a)

12. Tent (712, 715, 716) with frame (722, 725, 726), inner tent (732, 735, 736) and at least one cover tent (742, 745, 746) according to the claims 1 or 3,  
**characterized in that** at least **one** additional middle back pole (836) exists, for which the crossing-piece (834) is provided with a fifth additional middle back joining (835), for which the tent bottom (752, 756) may be provided with a fifth additional middle back corner (765).  
**or two** additional back poles (865, 866) exist, for which the crossing-rod (870) is provided with two additional back joinings (873), and then the tent bottom (755) may be provided with a fifth and a sixth back corner (775, 776), thus two additional back corners.  
(For ex. 12, 15, 16, see figs. 431a, 475, 476a, 487, further 445)
13. Tent (1, 4, 7, 9, 10, 71, 711, 712, 713) with frame (11, 17, 19, 20, 70, 721, 722, 723), inner tent (21, 27, 29, 30, 731, 732, 733) and a cover tent (31, 37, 39, 40, 69, 741, 742, 743), according to the claims 1, 2 or 3,  
**characterized in that** a middle angle piece (305) or two angle pieces (257, 258) are present in the front projecting range (234),  
**either** at which in longitudinal direction at least one middle front rod (307) or two front lateral rods (263, 264) are attached, which hold a front roof (340, 356), which are placed over a variable front ventilation (353), whose air flap (354, 361) is closed or partially or fully opened especially by means of two zippers (352; 358, 359),  
**or** in preferred embodiment, when the outer entry (341, 347, 349, 350) of the cover tent (31, 37, 38, 39, 40, 69, 731, 732, 733) is opened, its lower front part (3629 can be tied back at the frame (11, 17, 19, 20, 70, 721, 722, 723), especially by means of bands (363, 364) or burr bands.  
(For ex. 1, 4, 7, 7SP, 9, 10, 11, 12, 13, see figs. 134a, 135a, 165a, 180a, **221a** to **223a**, **248a** to **256a**, 429a, 430a, 433a, 434a)
14. Tent (1 to 10, 71, 711, 713, 714, 716) with frame (11 to 20, 70, 721, 723, 724, 726), inner tent (21, 27, 29, 30, 731, 733, 734, 736) and at least one cover tent (31 to 40, 69, 741, 743, 744, 746), according to the claims 1, 2 or 3,  
**characterized in that** an interspace (379) exists above on the rear between said inner tent (21, 27, 29, 30, 731, 733, 734, 736) and

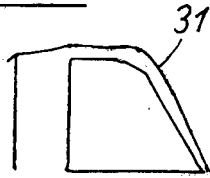
said cover tent (31 to 40, 69, 741, 743, 744, 746), and over said interspace (379) in said cover tent (31 to 40, 69, 741, 743, 744, 746) a variable rear ventilation (380) is arranged, under this a sloping area (388) of waterproof fabric is sewn at said cover tent (31 to 40, 69, 741, 743, 744, 746), which hangs so in said interspace (379), that it protects said inner tent (21, 27, 29, 30, 731, 733, 734, 736) against any rain,  
**and** in preferred embodiment said air ventilation (380) is provided in course of said cover tent (31 to 40, 69, 741, 743, 744, 746) with an air flap (381), which  
**either** in open condition is turned back and so is completely or partially held open especially by means of two different burr-bands (385, 386),  
**or** is closed partially or nearly completely by means especially of at least one zipper (383, 384) or burr-bands.  
(For ex. 1 to 11, 7SP, 13, 14, 16, see figs. 257a to 261a)

15. Tent (1 to 10, 71, 711 to 716) with frame (11 to 20, 70, 721 to 726), inner tent (21, 27, 29, 30, 731 to 736) and at least one cover tent (31 to 40, 69, 741 to 746), according to the claims 1, 2 or 3,  
**characterized in that** the collapsed tent (1 to 10, 71, 711 to 716) is packed in especially three different bags containing said frame (11 to 20, 70, 721 to 726), said inner tent (21, 27, 29, 30, 731 to 736) and said cover tent (31 to 40, 69, 741 to 746);  
**and** said bags are stowed away in a car (960) in areas (961, 962; 965; 967) not being well used under normal circumstances, especially in the lateral areas (961, 962) behind the rear wheels (963, 964), the area (965) under the seat (966), or in the free area (967) under the luggage room (968).  
(For ex. 1 to 16, see figs. 488a and 489a)



Ex. 1, 4 (13)

Fig. 19



Ex. 7 (11)

Fig. 22



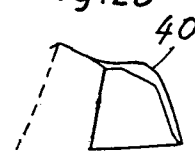
Ex. 9

Fig. 25



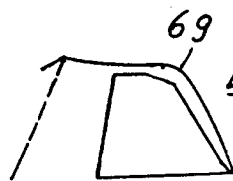
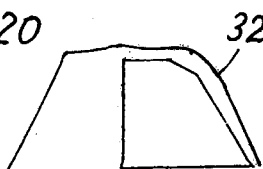
Ex. 10

Fig. 26



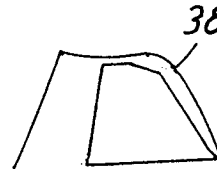
Ex. 2, 5 (15)

Fig. 20



Ex. 7SP (12)

Fig. 23



Ex. 8

Fig. 24

Ex. 3, 6 (16)

Fig. 21



Fig. 27  
Section  
A-A



Section  
B-B

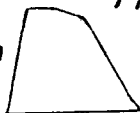


Fig. 28

Section C-C Section D-D

Fig. 29



Fig. 30



Fig. 31

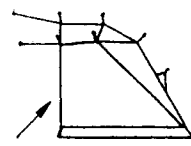


Fig. 32

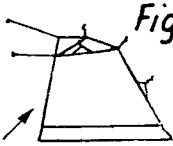


Fig. 33

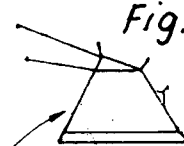


Fig. 34

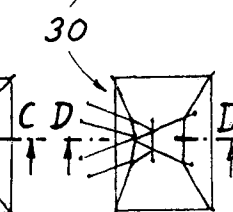
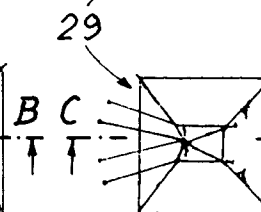
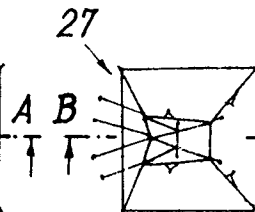
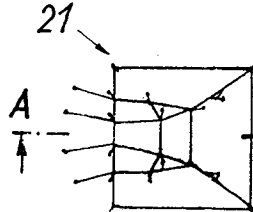
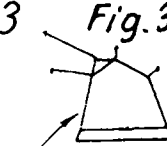
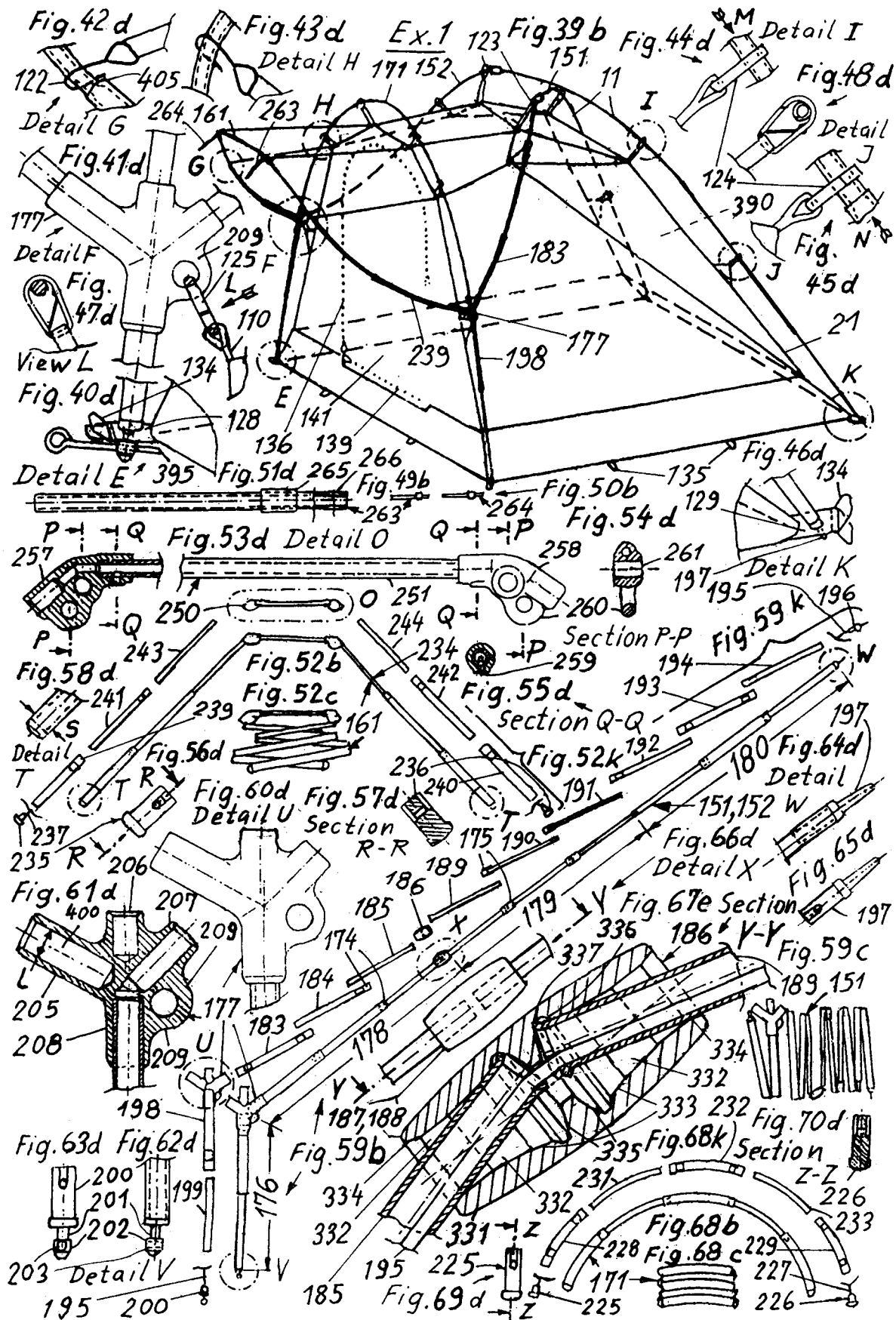


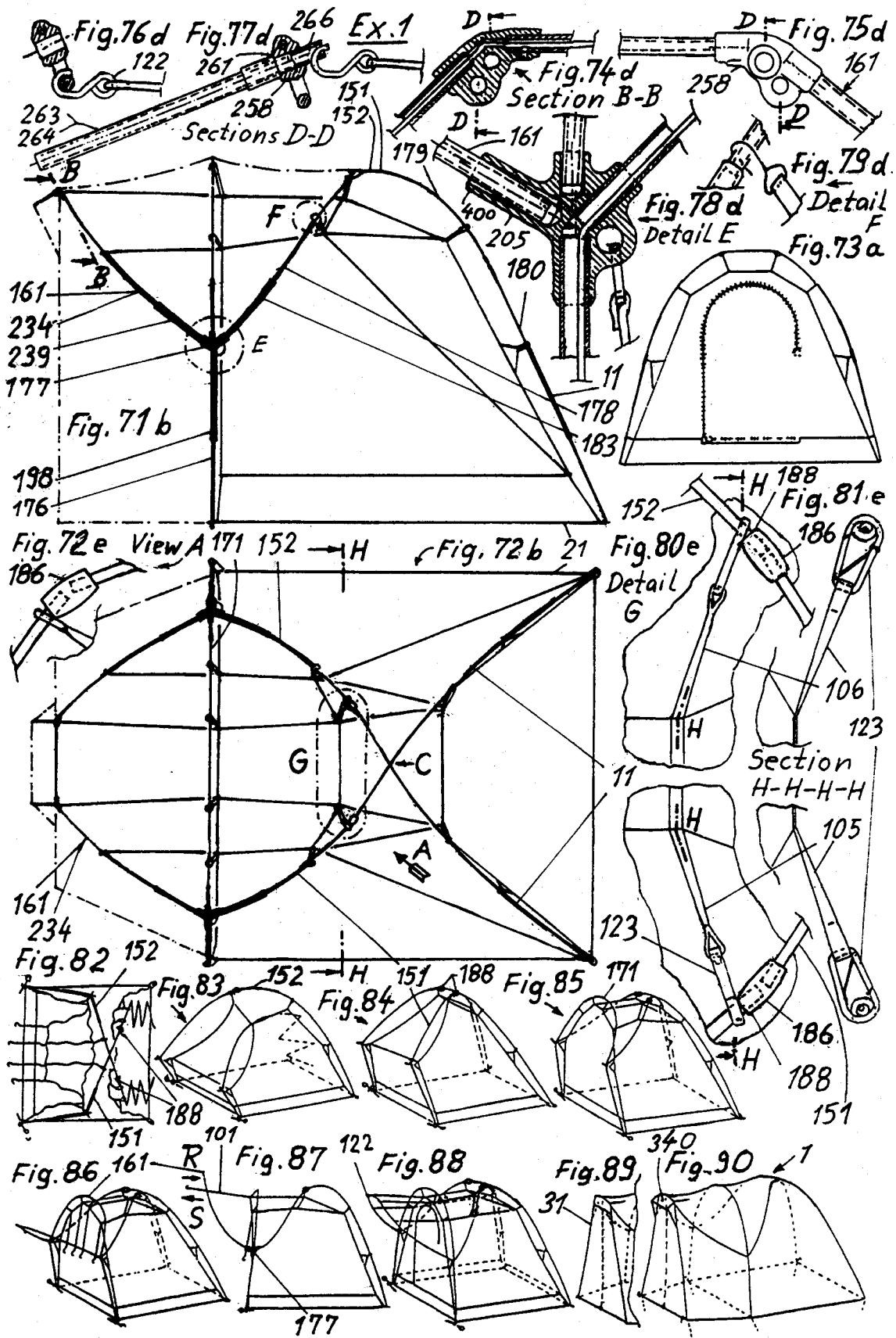
Fig. 35

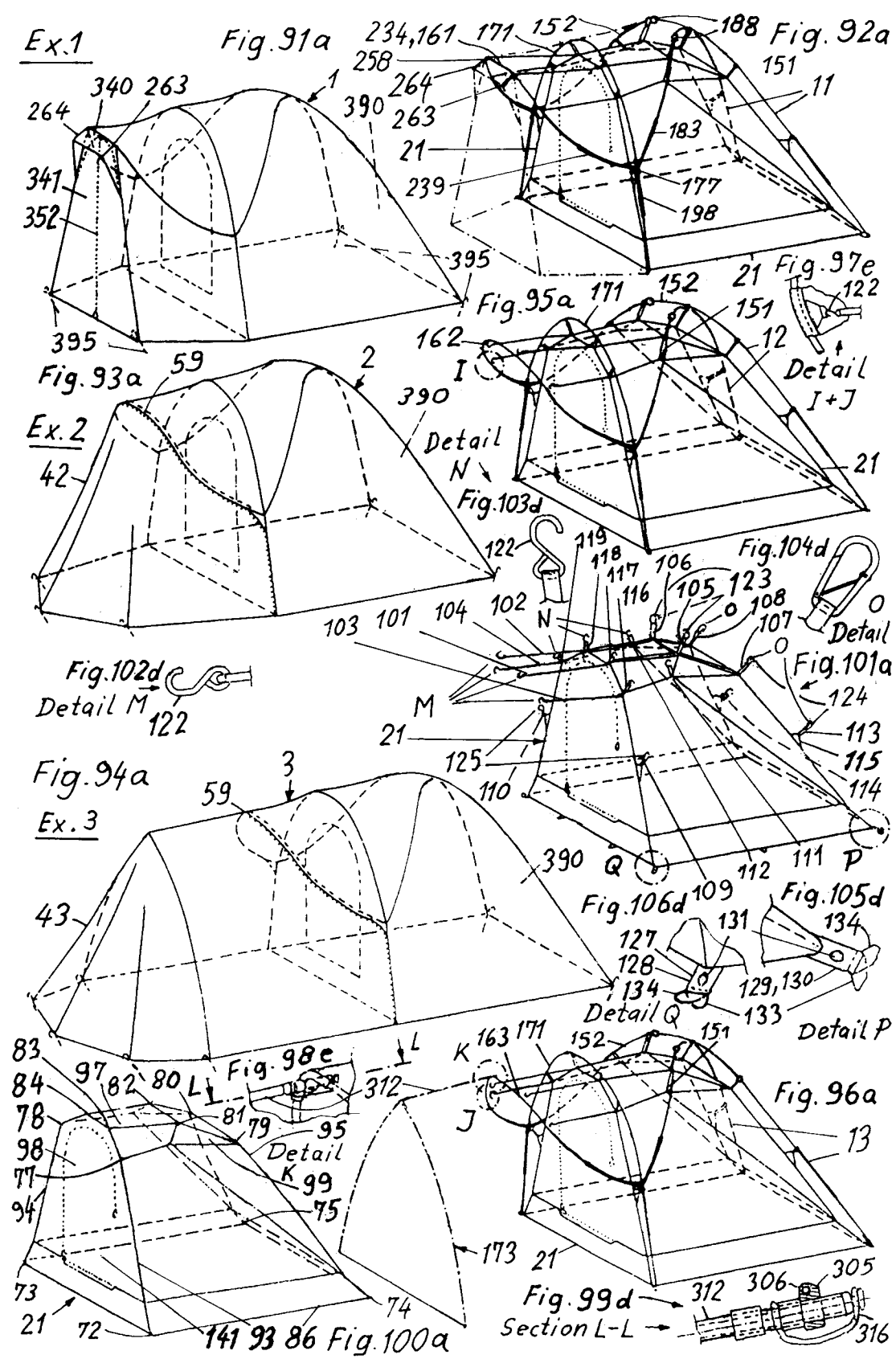
Fig. 36

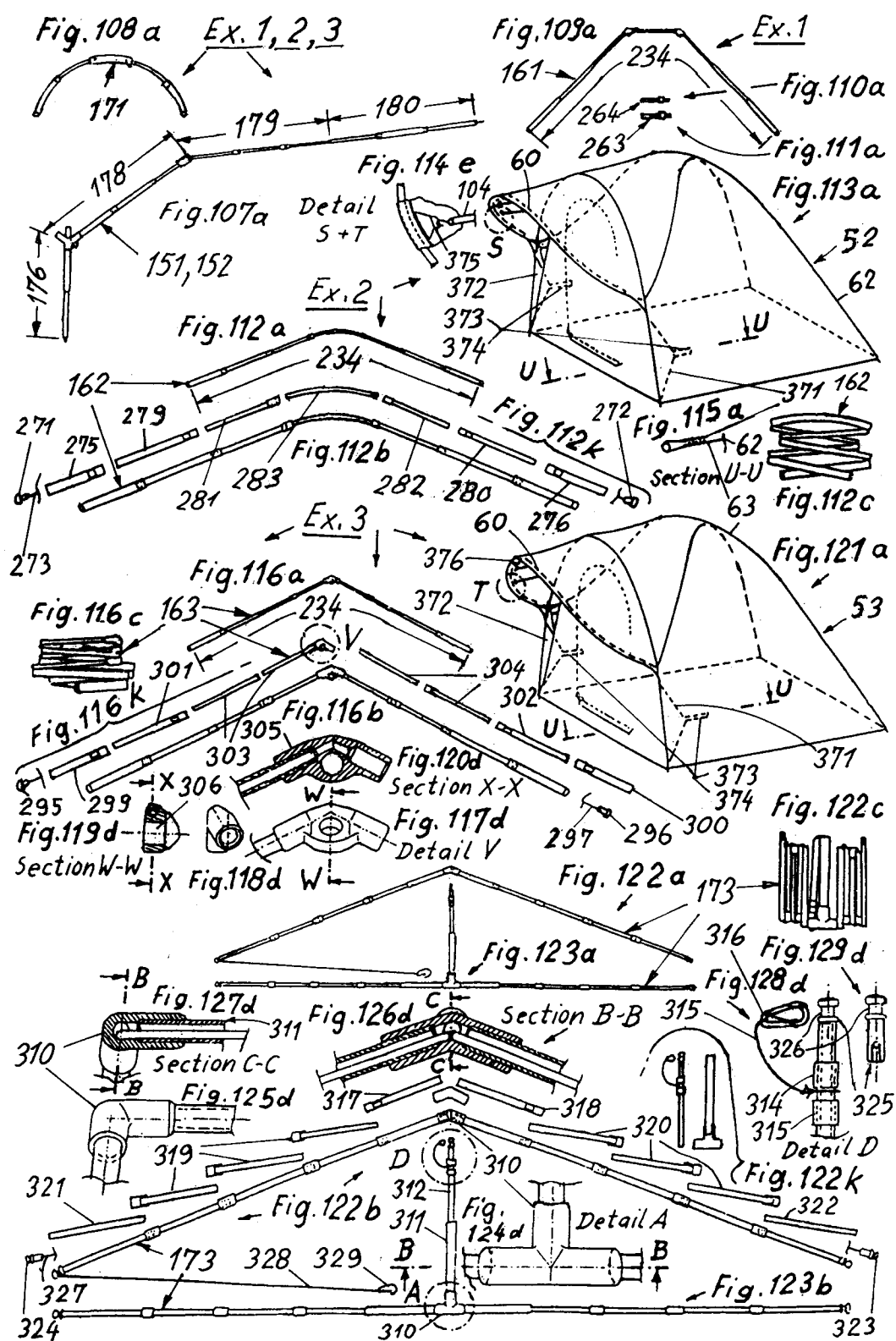
Fig. 37

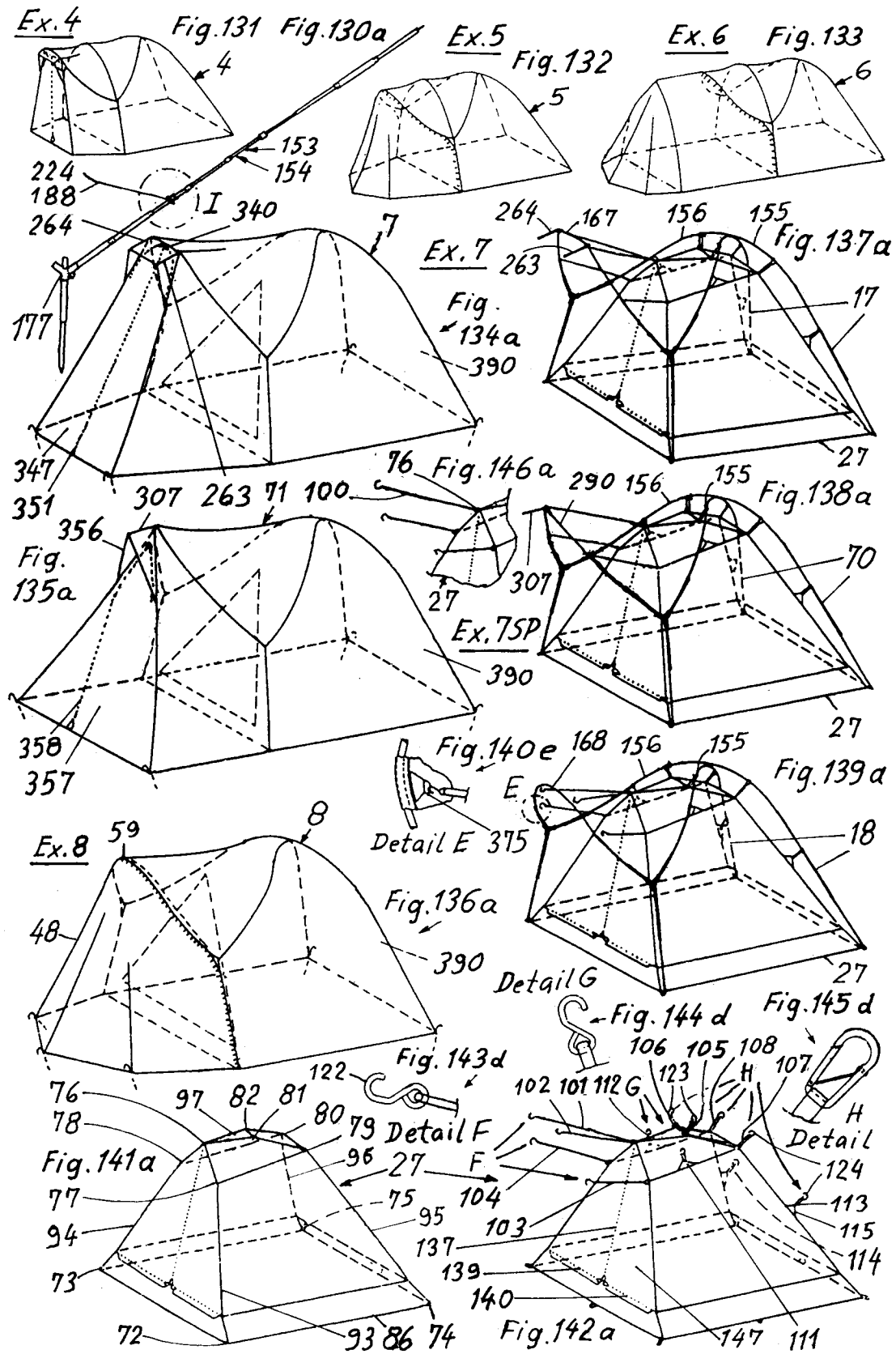
Fig. 38

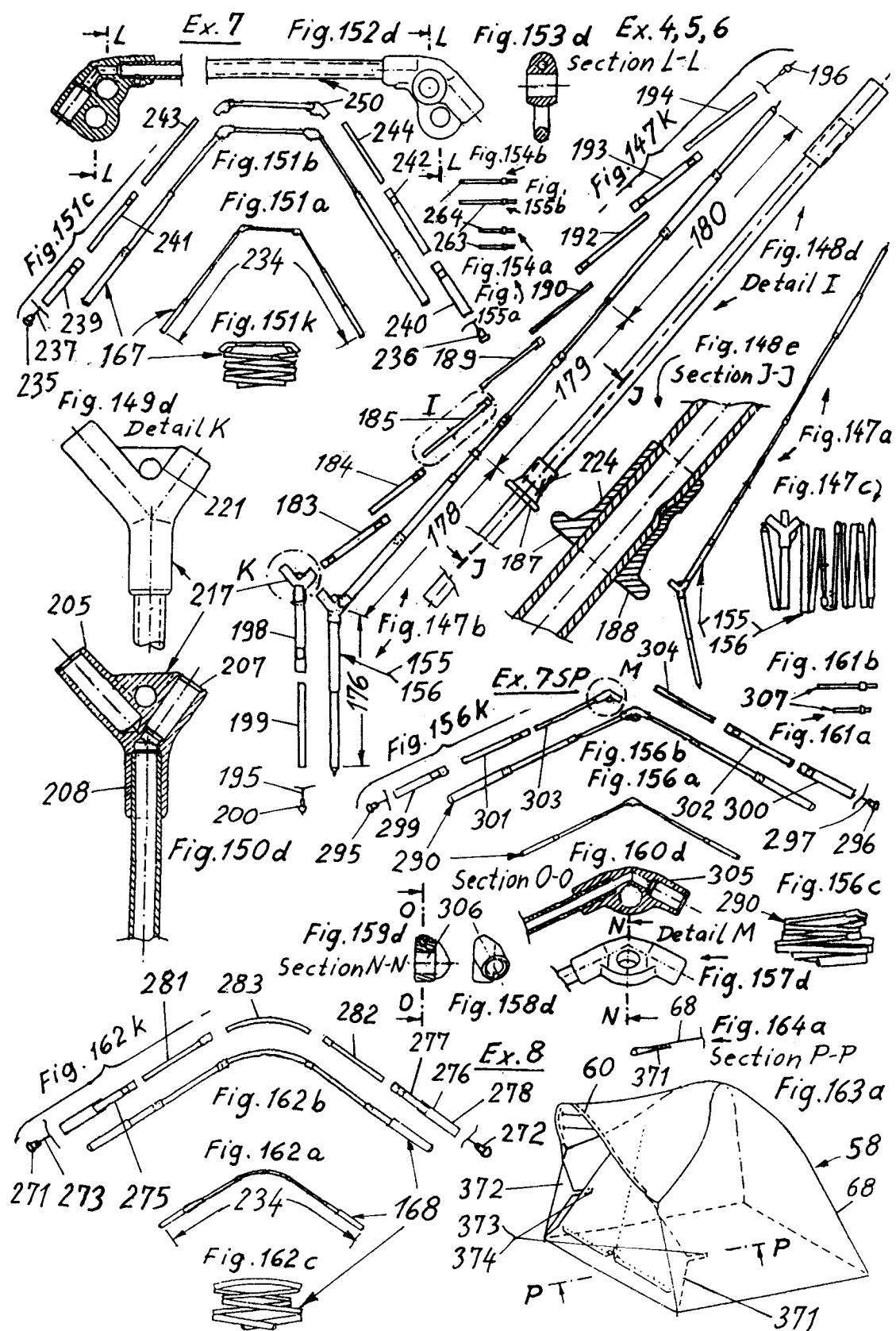


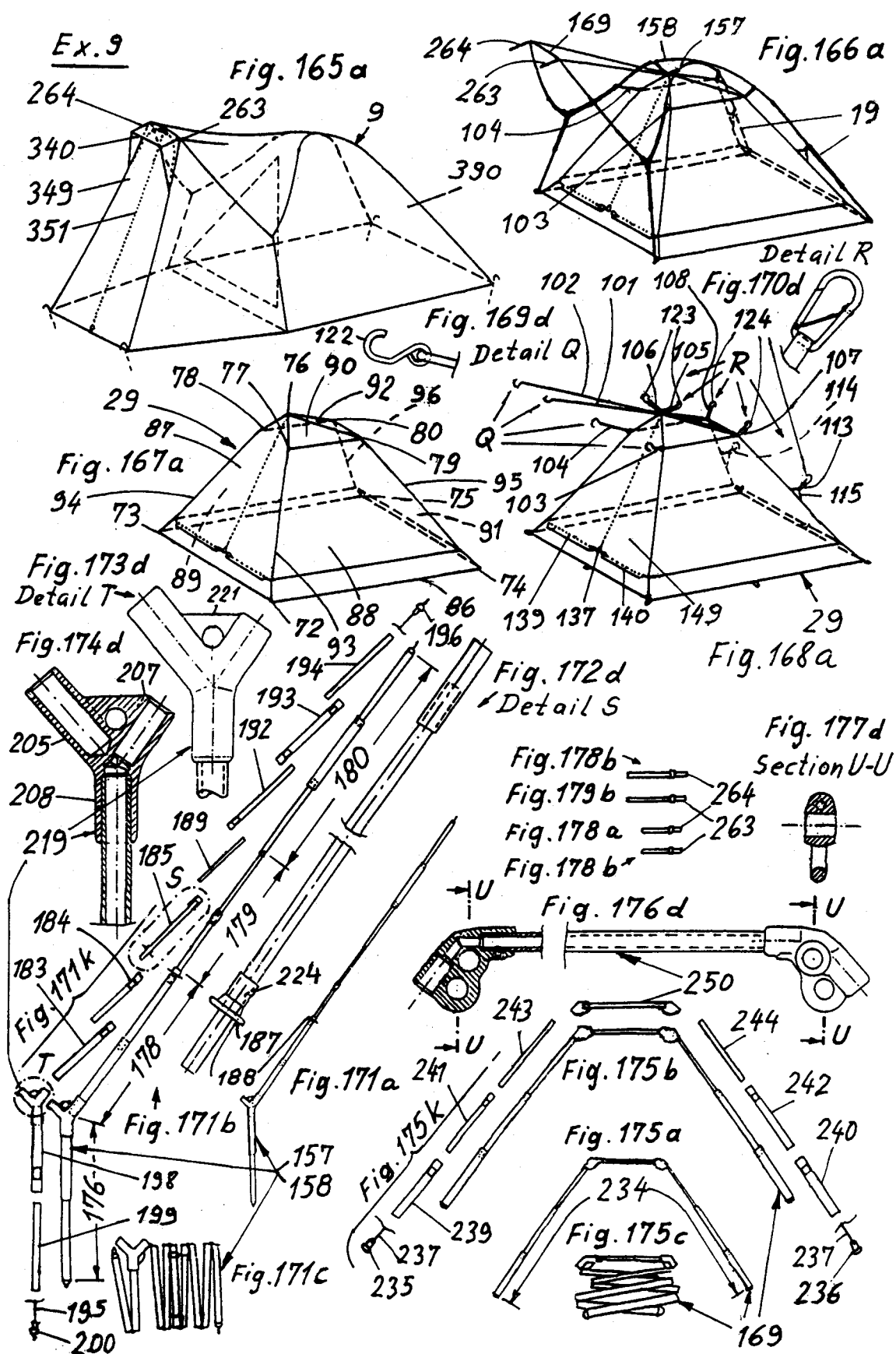


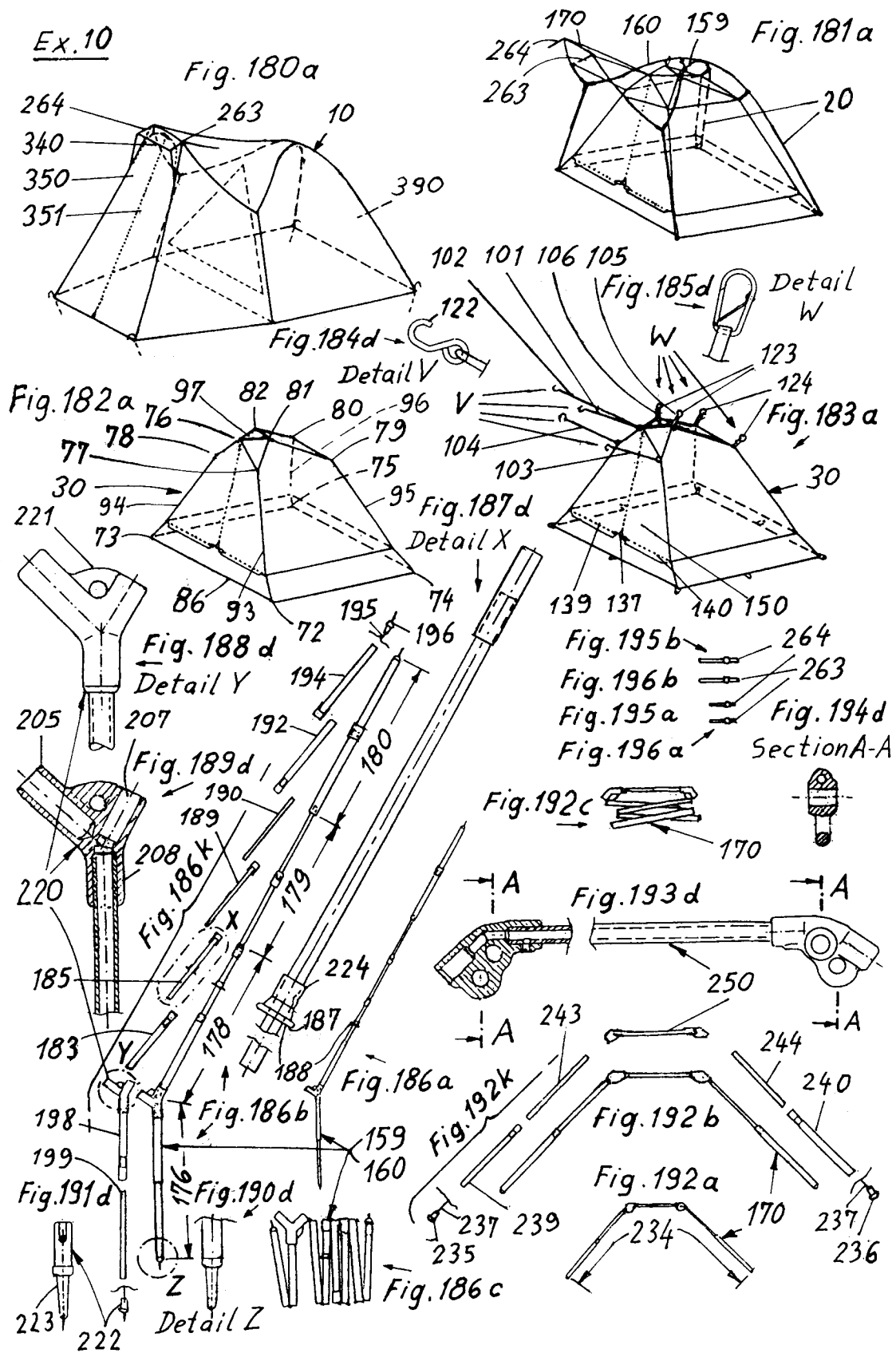












Ex. 1, 4, 13

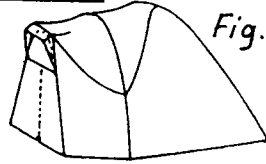


Fig. 197

Ex. 2, 5, (8, 15)

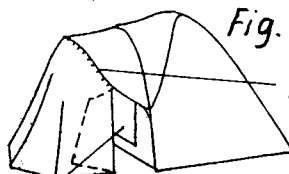


Fig. 202

Ex. 3, 6, (16)

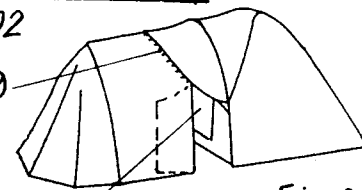


Fig. 205

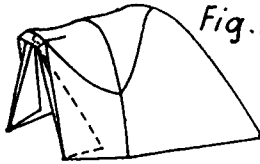


Fig. 198



Fig. 203

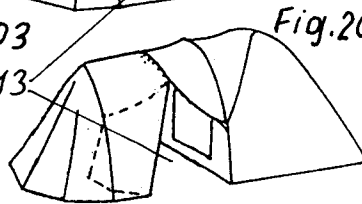


Fig. 206

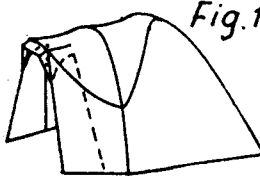


Fig. 199

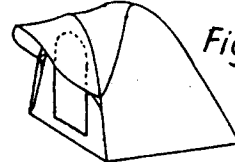


Fig. 204

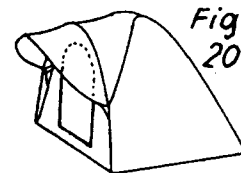


Fig. 207

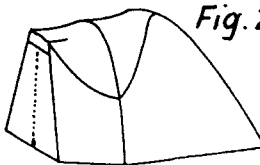


Fig. 200

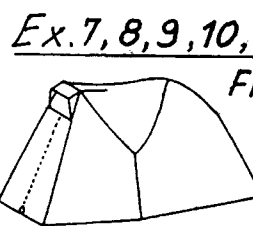


Fig. 208

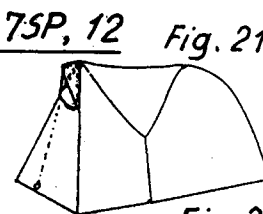


Fig. 213

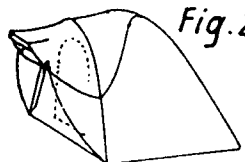


Fig. 201

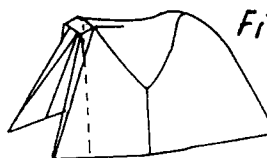


Fig. 209

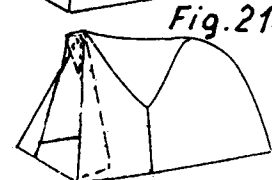


Fig. 214

Ex. 1, 2, 3, 4, 5, 6,  
11, 12, 13, 14, 15, 16  
Fig. 218 Fig. 219

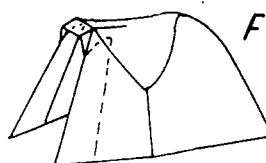
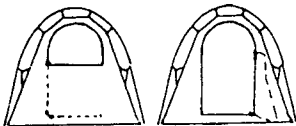


Fig. 210

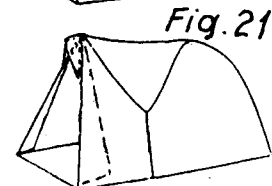


Fig. 215

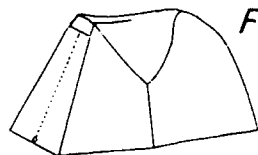


Fig. 211

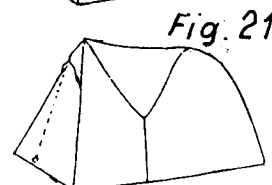


Fig. 216

Ex. 7, 8, 9, 10

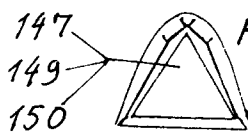


Fig. 220

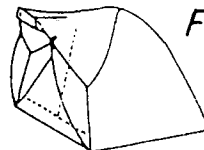


Fig. 212

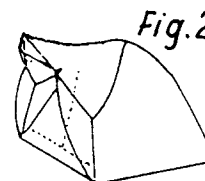
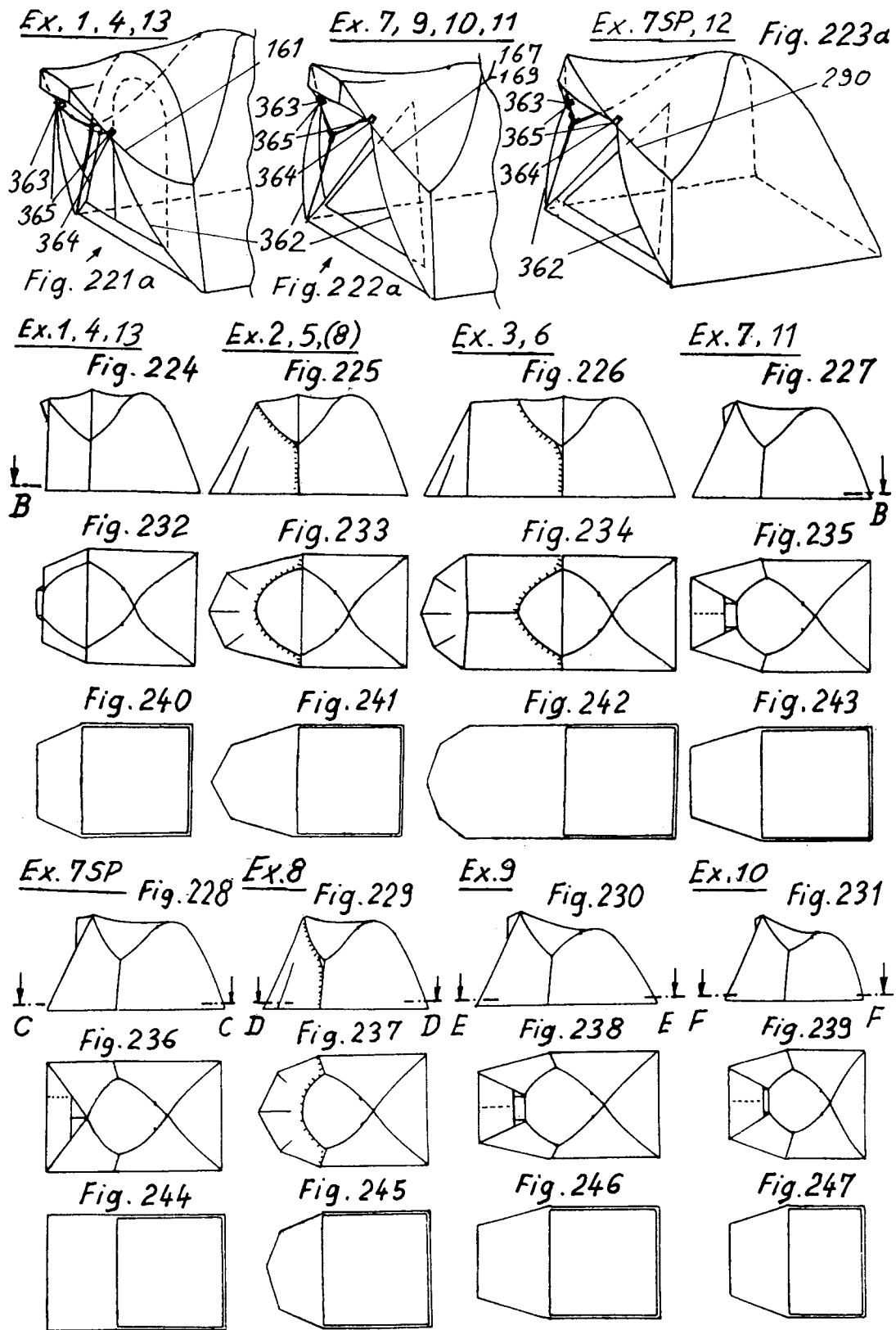
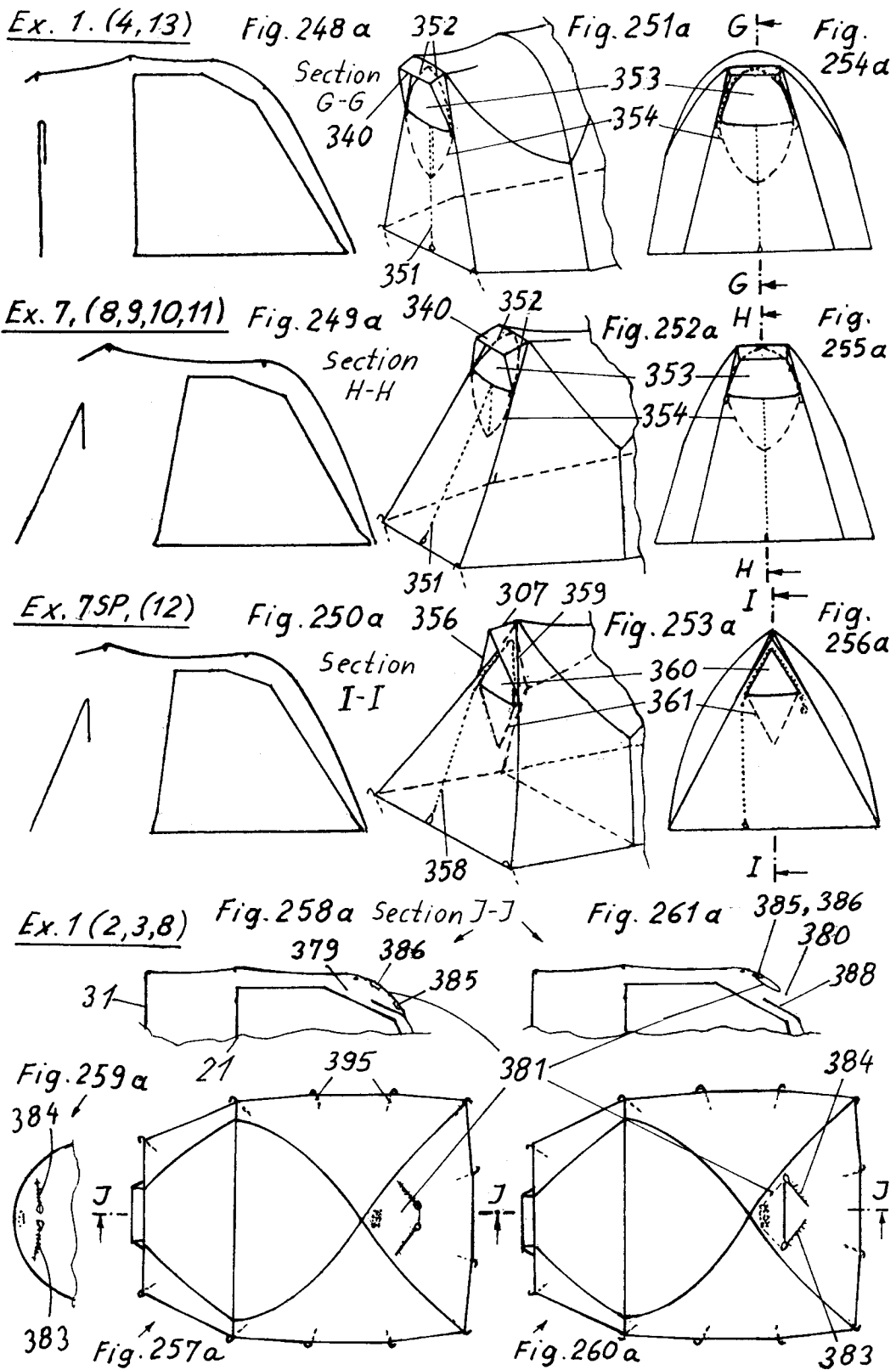
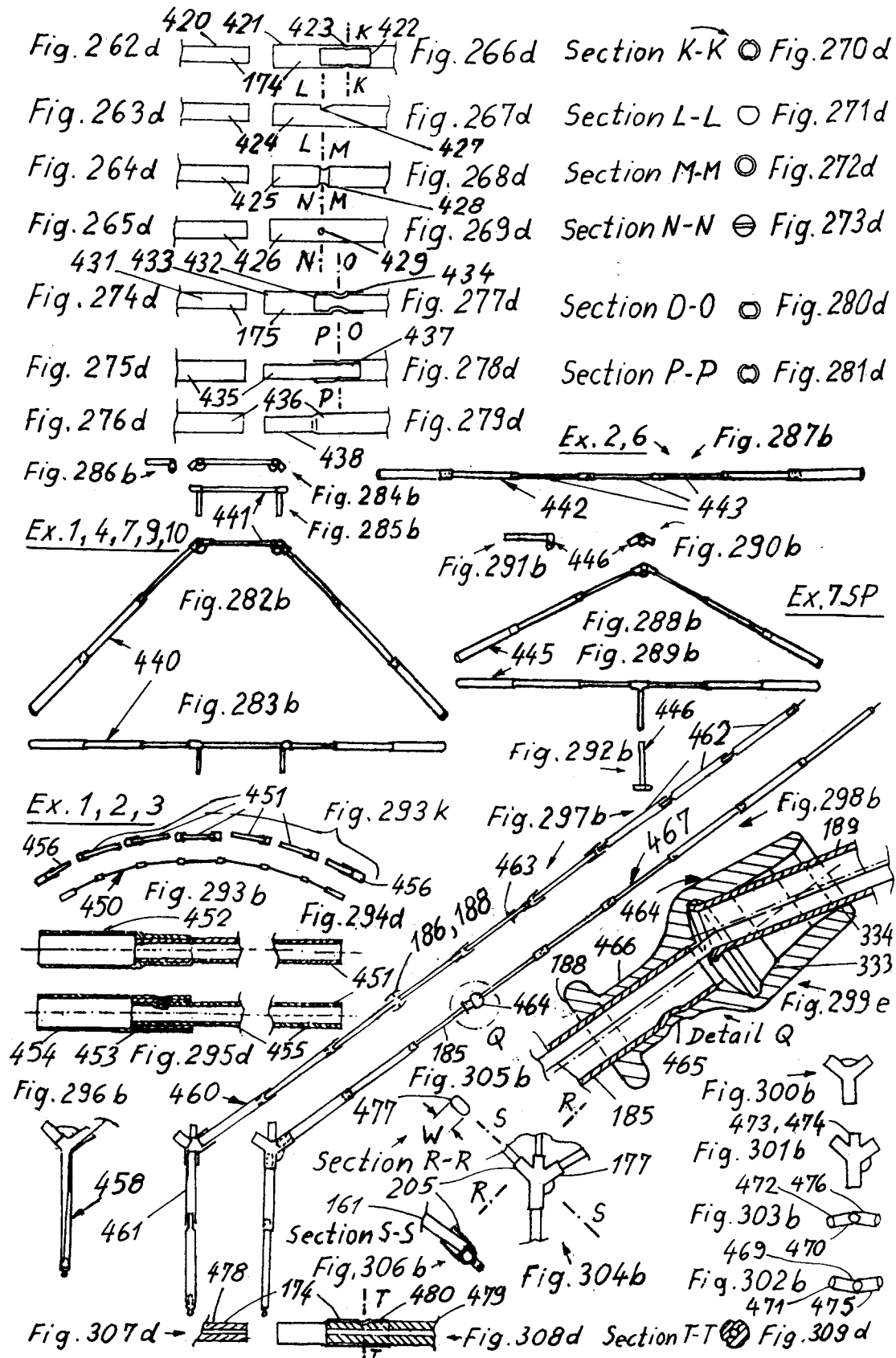
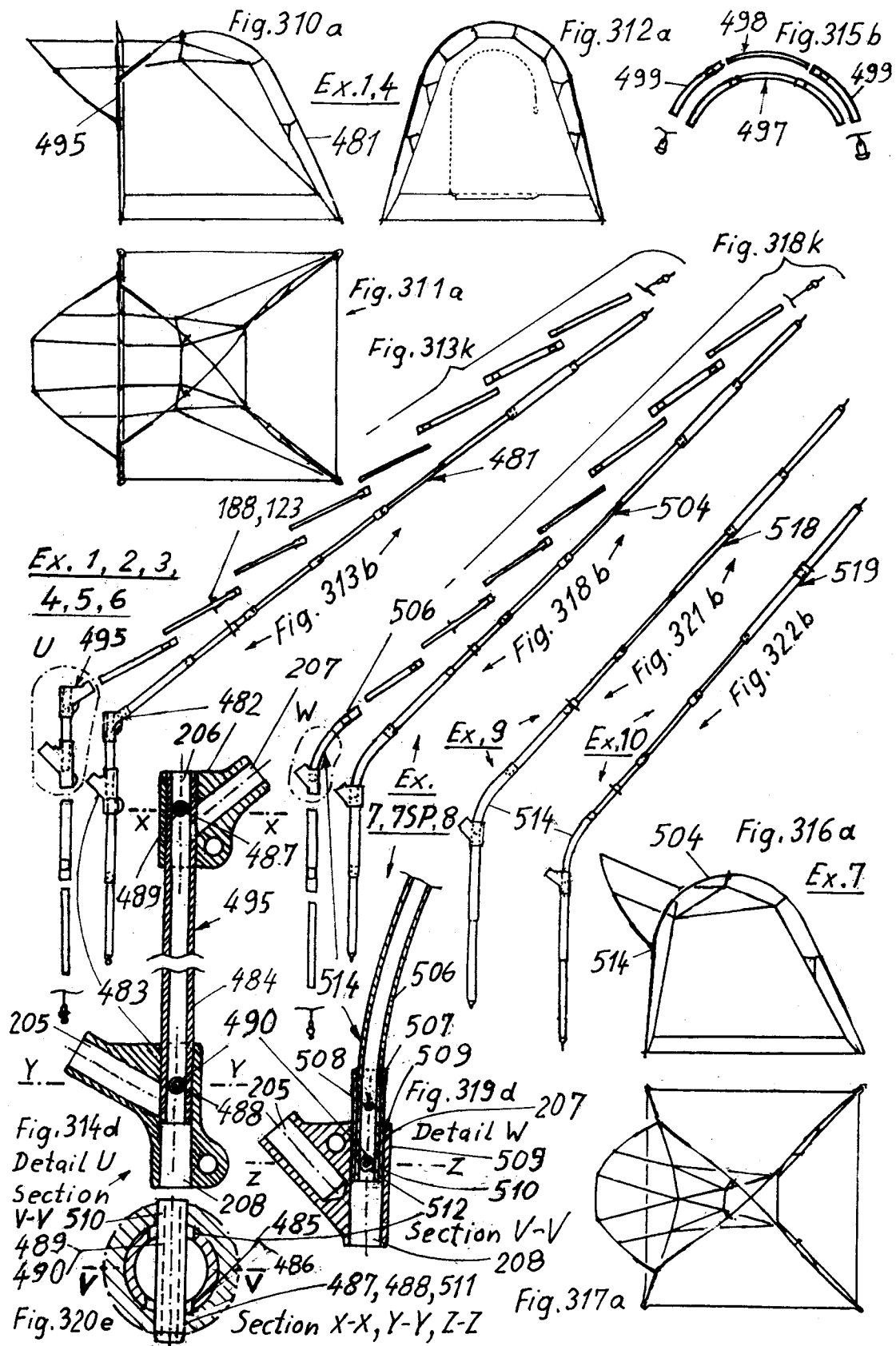


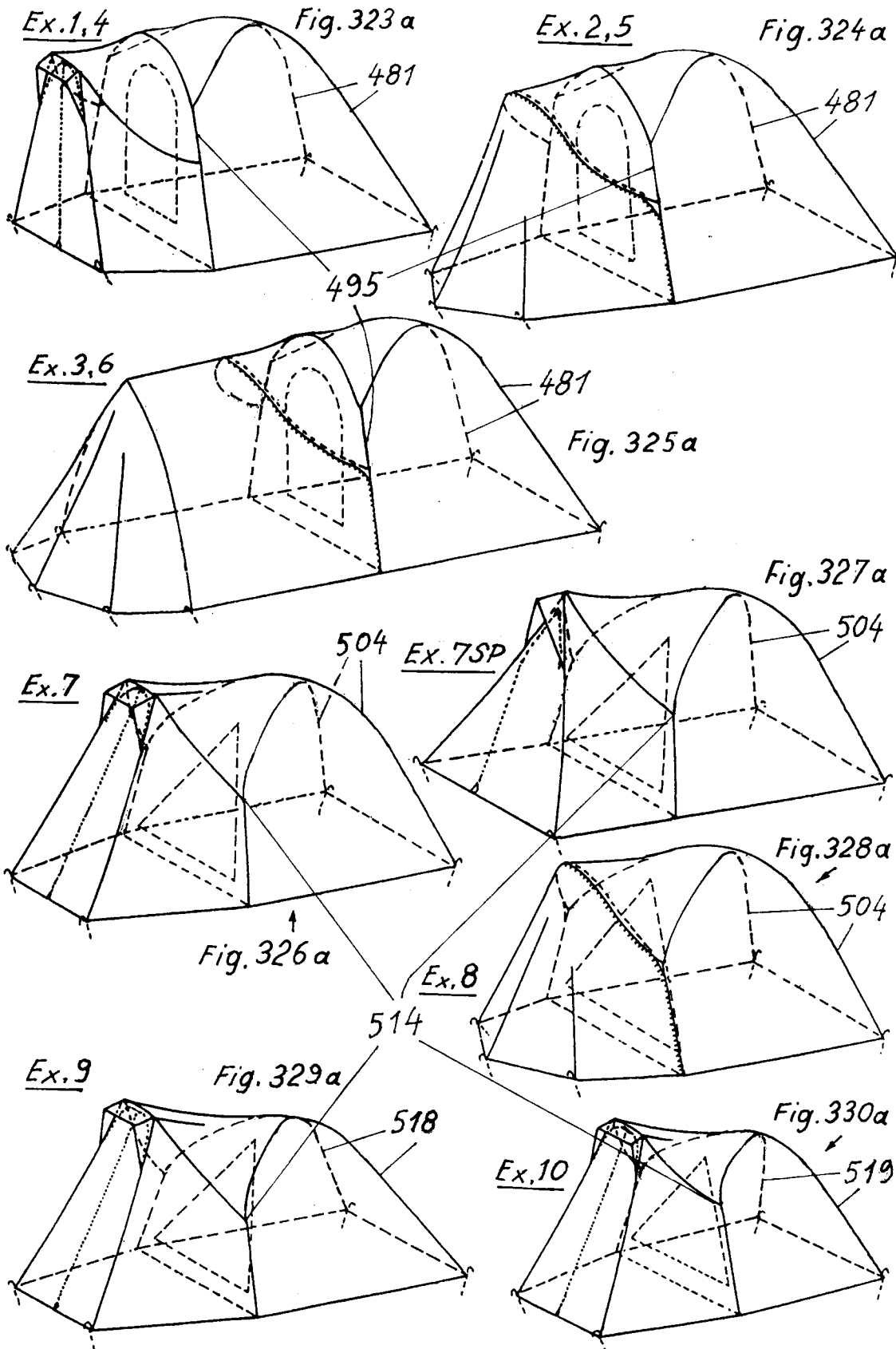
Fig. 217

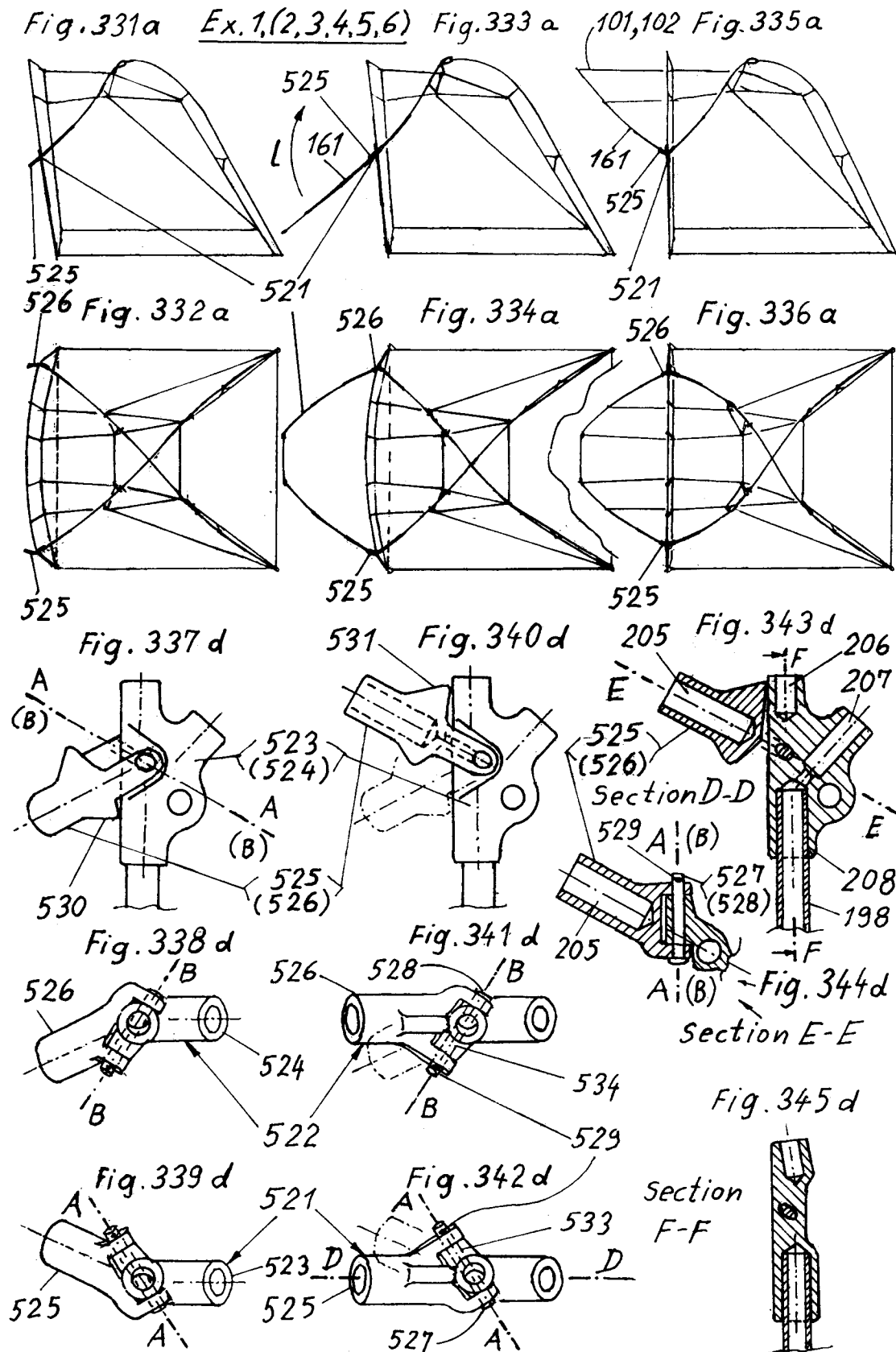


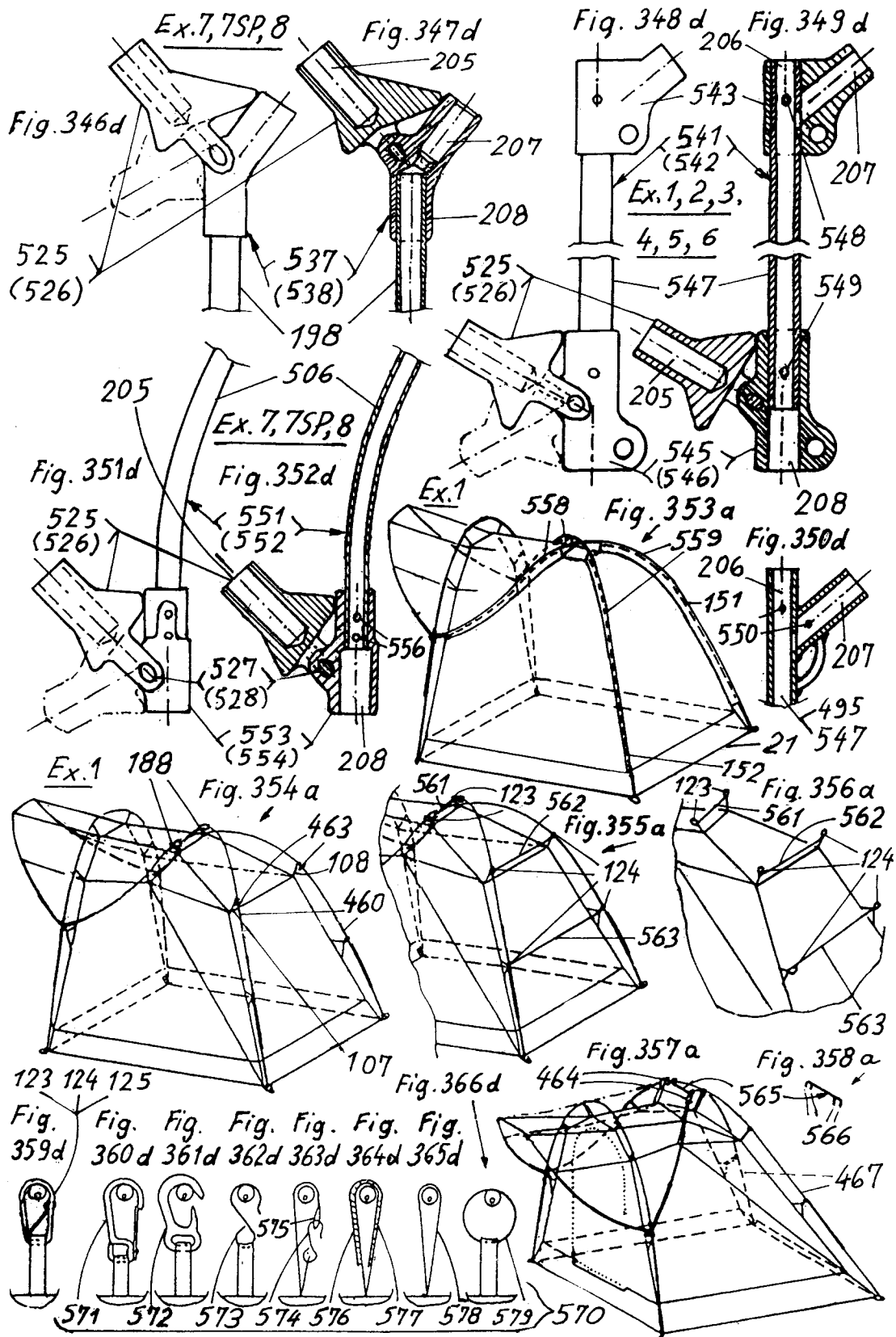


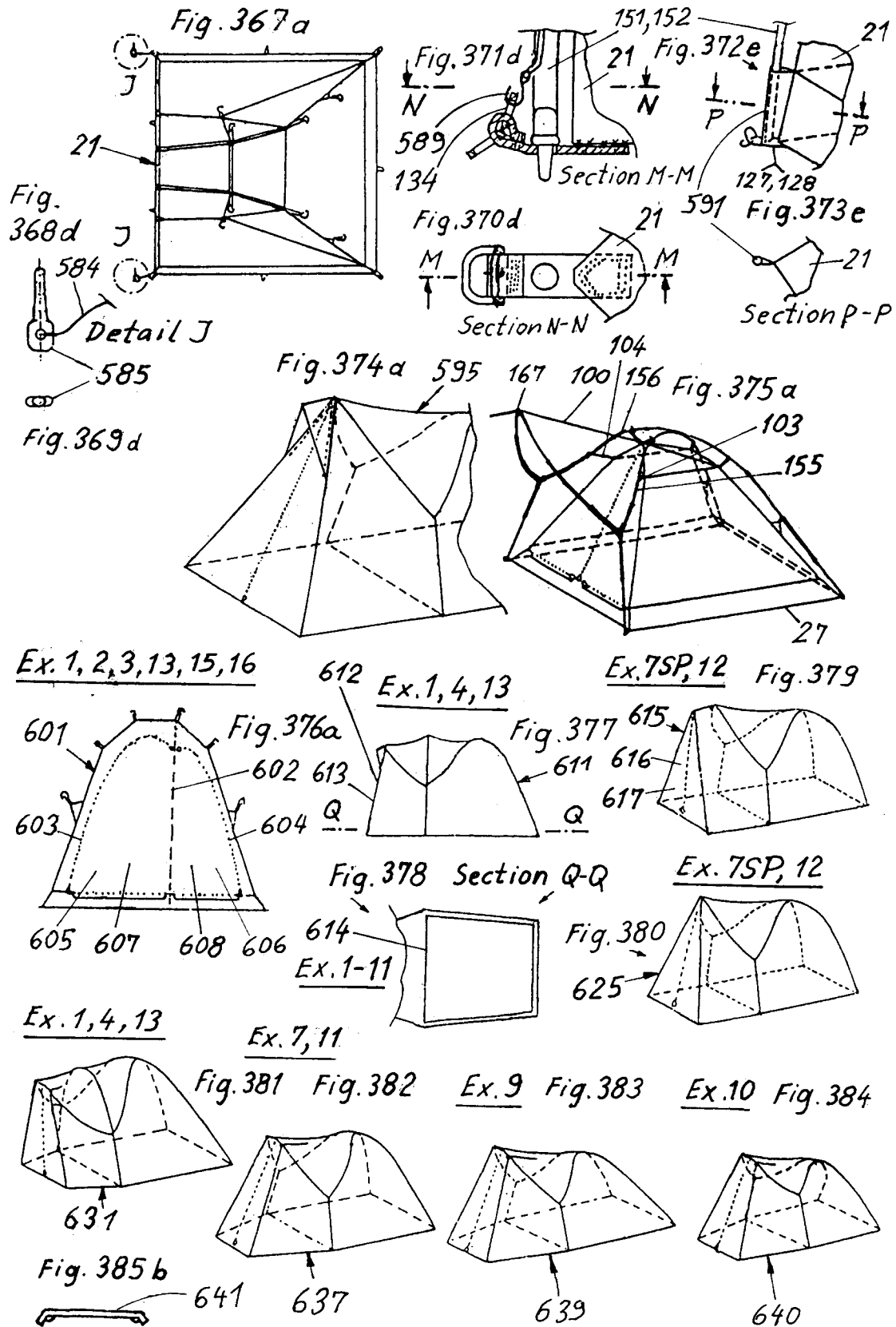






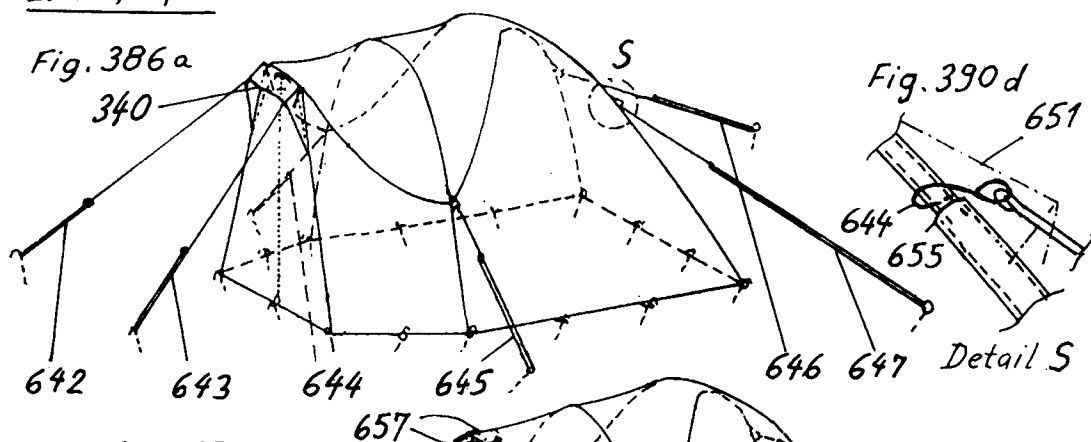






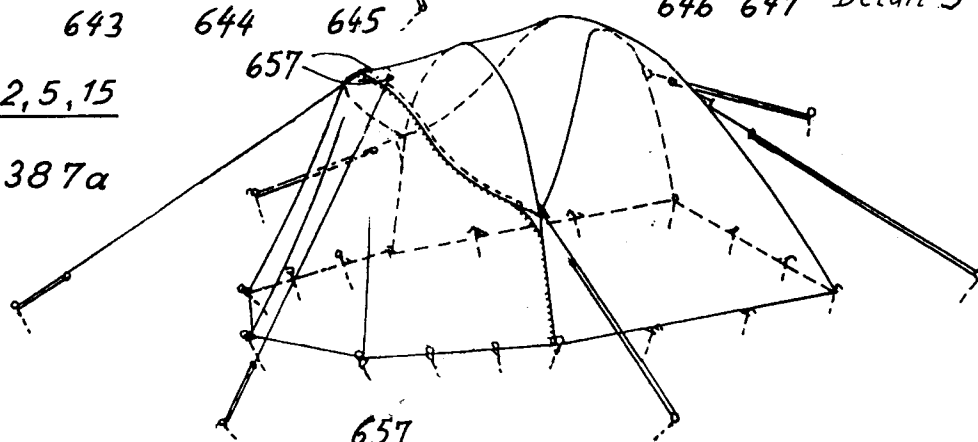
Ex. 1, 4, 13

*Fig. 386a*



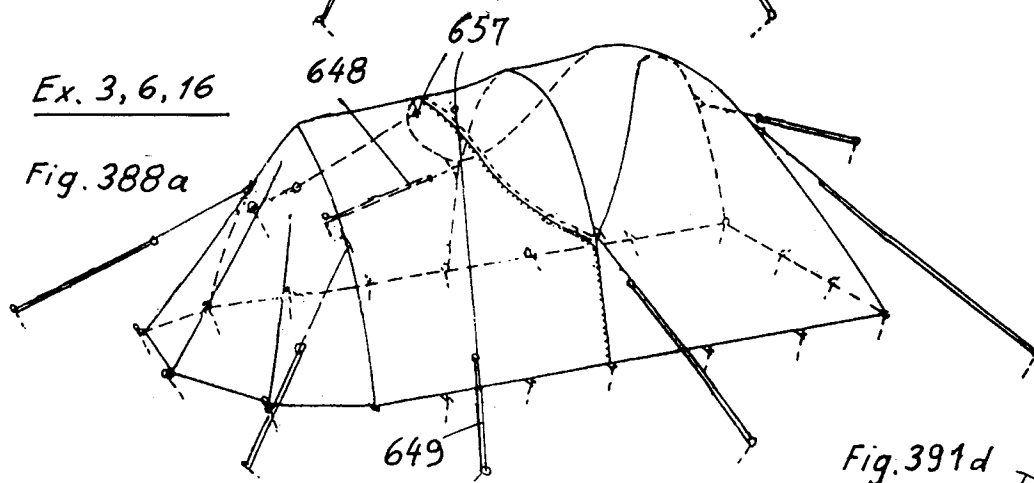
Ex. 2, 5, 15

*Fig. 387a*



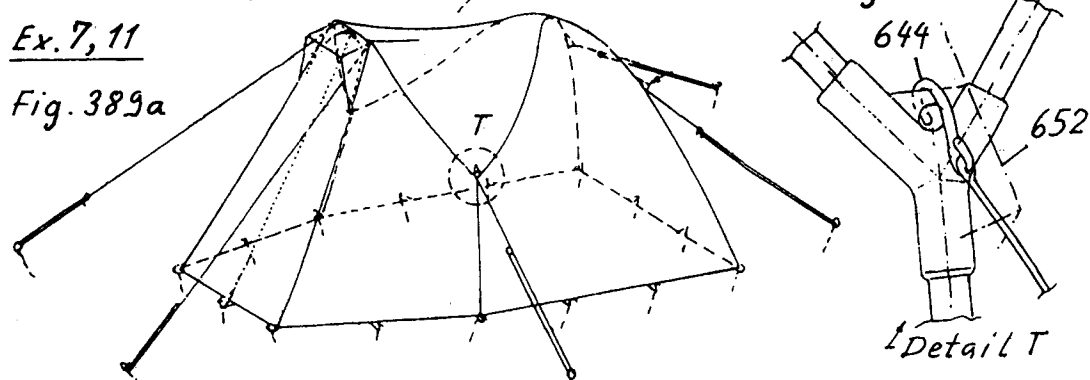
Ex. 3, 6, 16

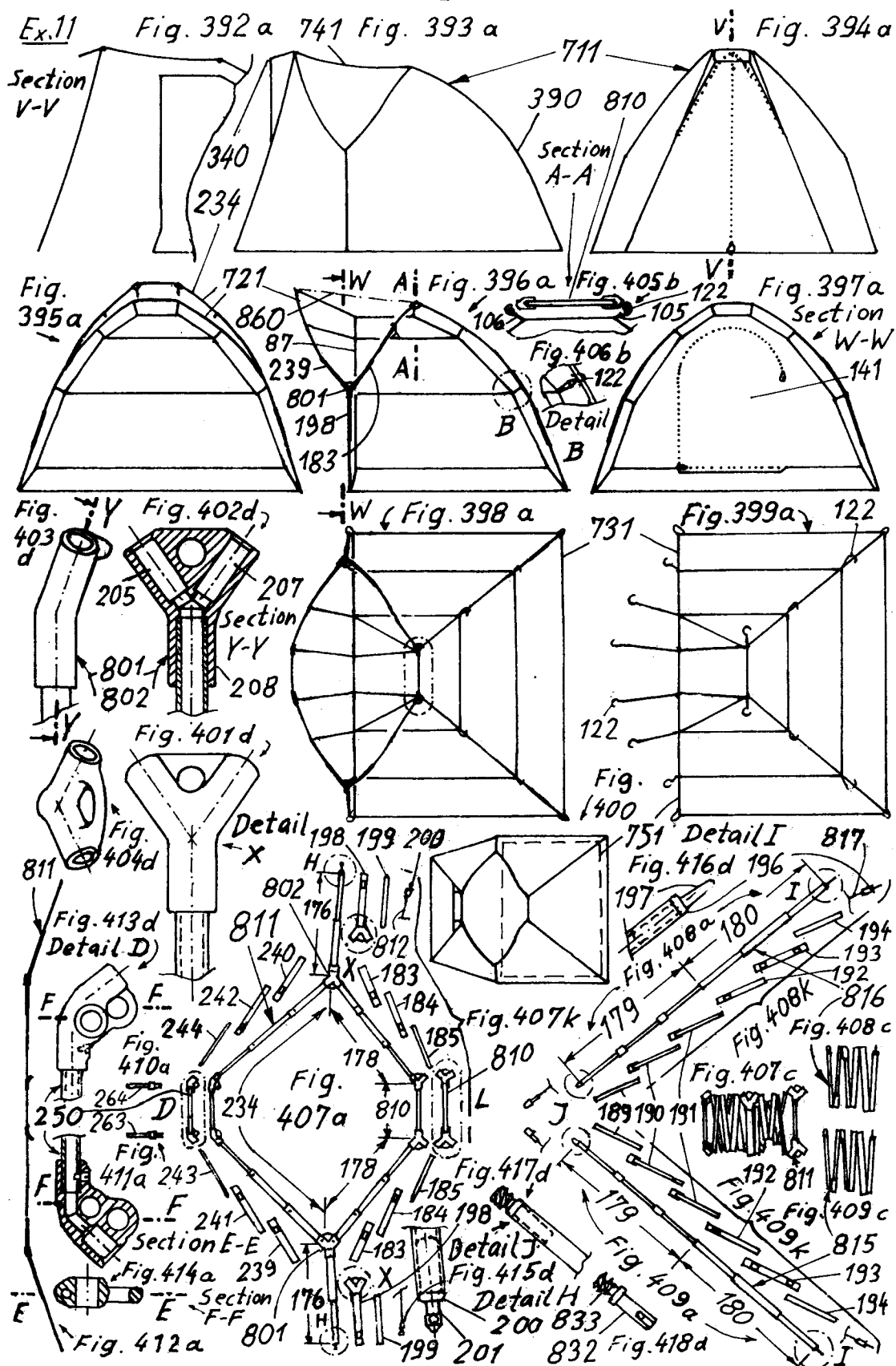
*Fig. 388a*

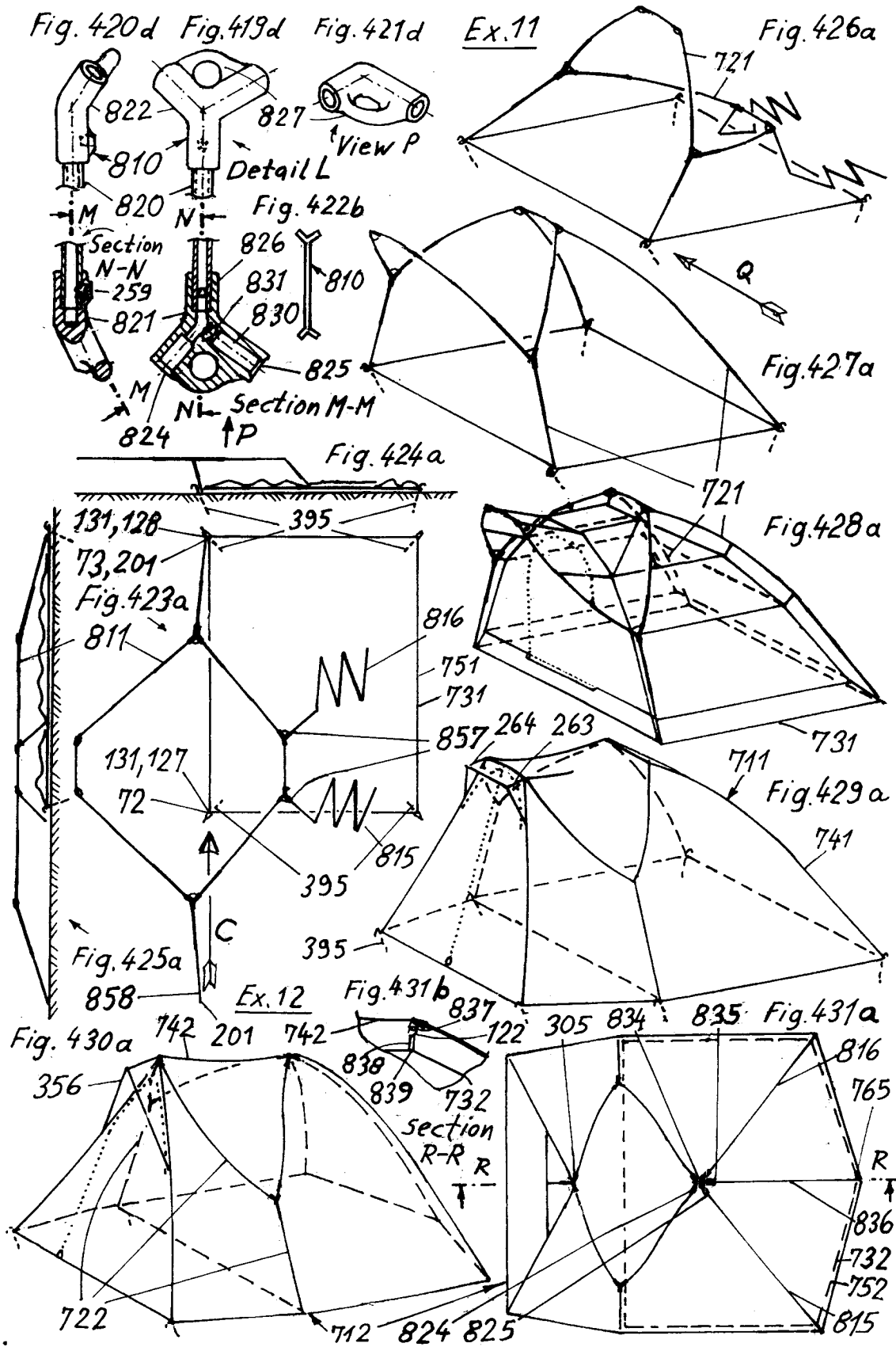


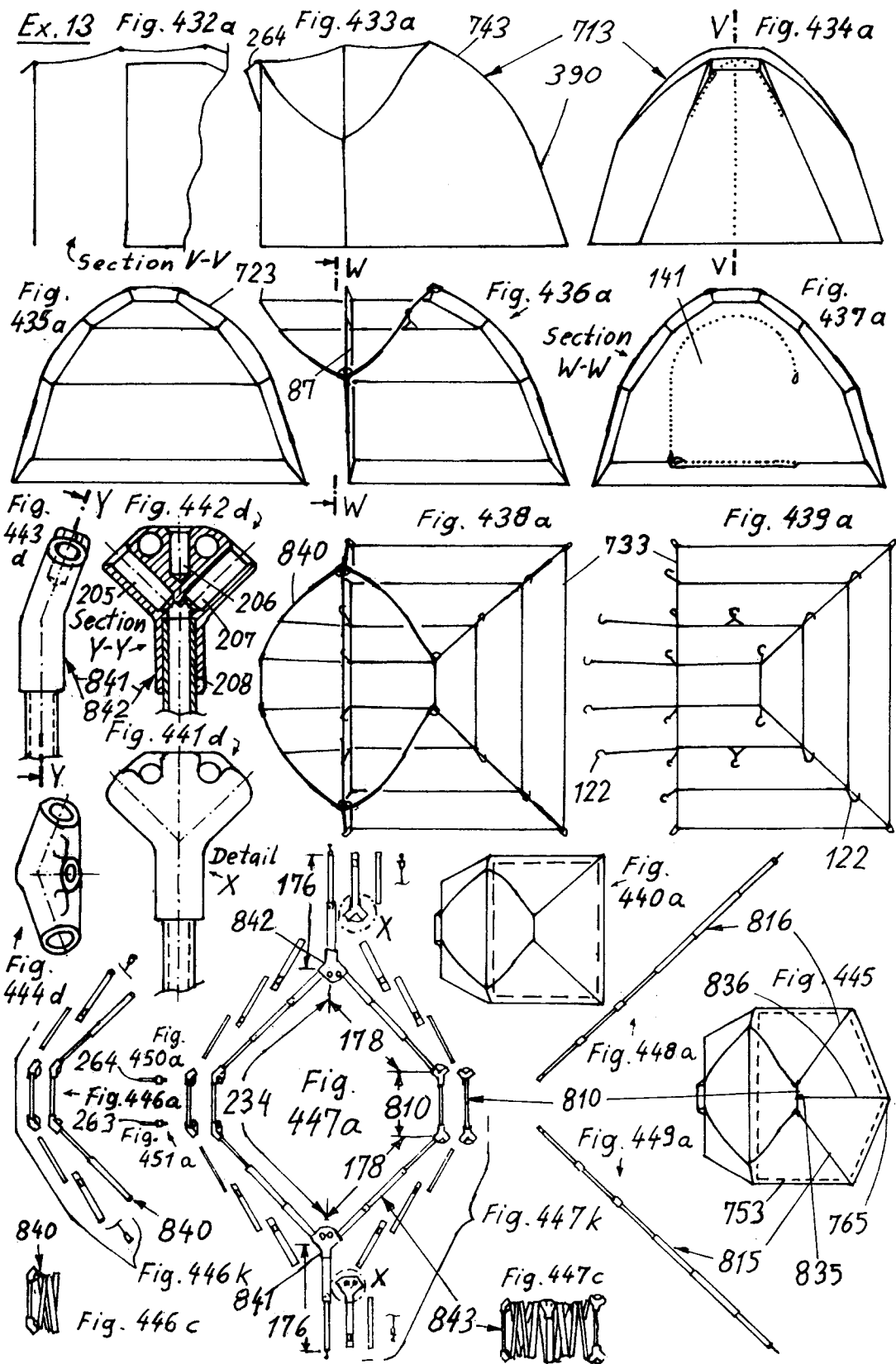
Ex. 7, 11

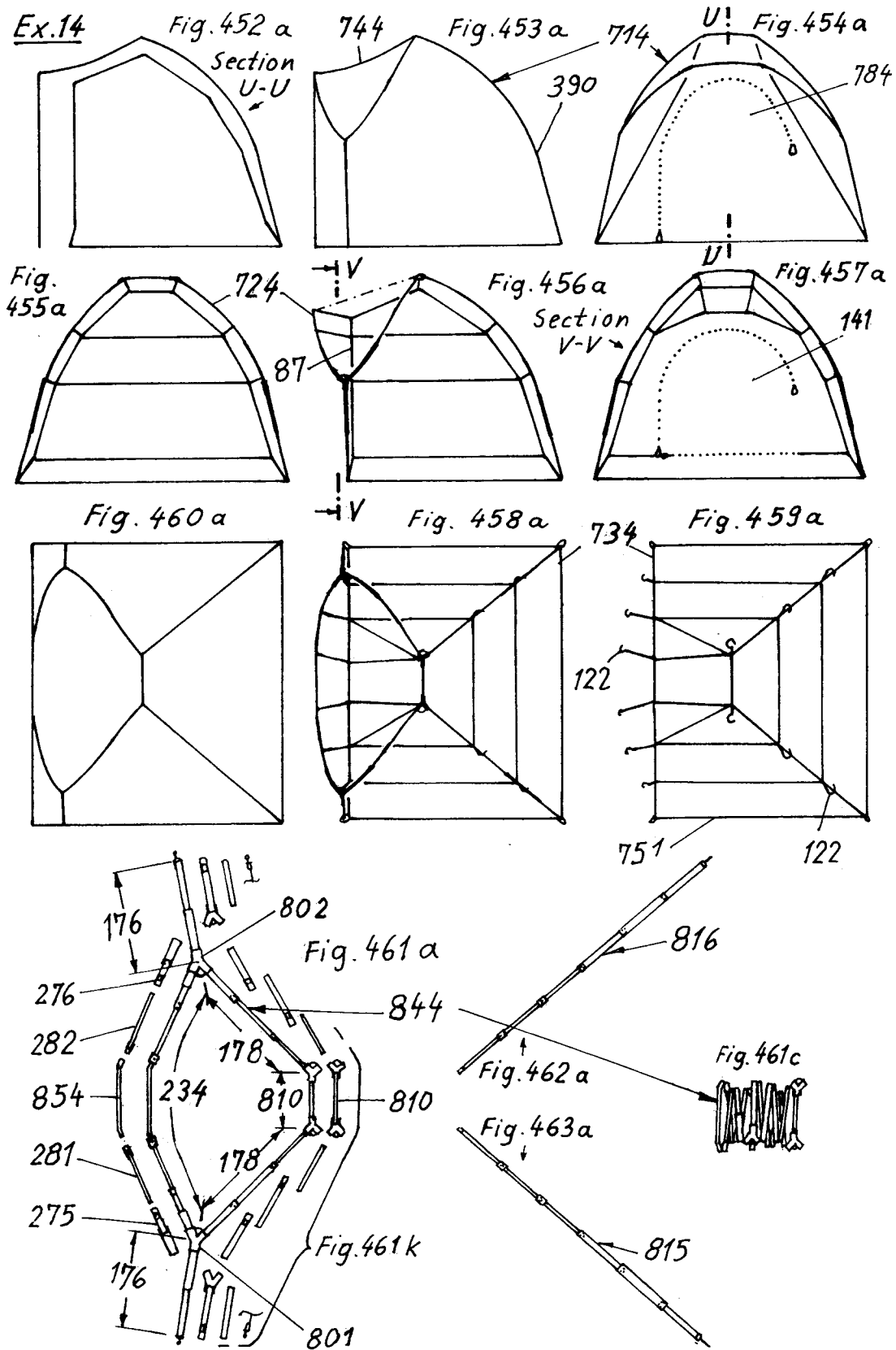
*Fig. 389a*



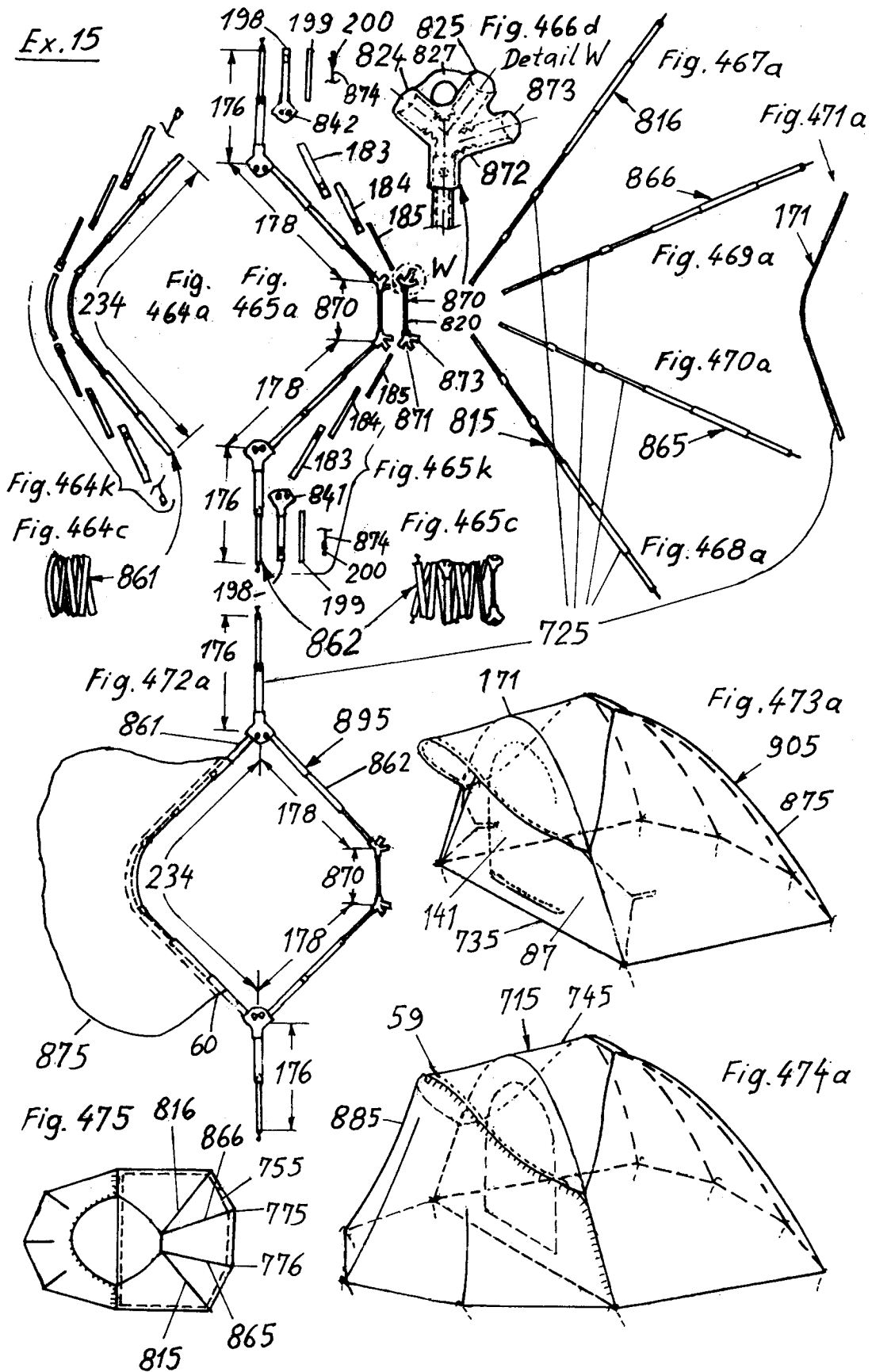


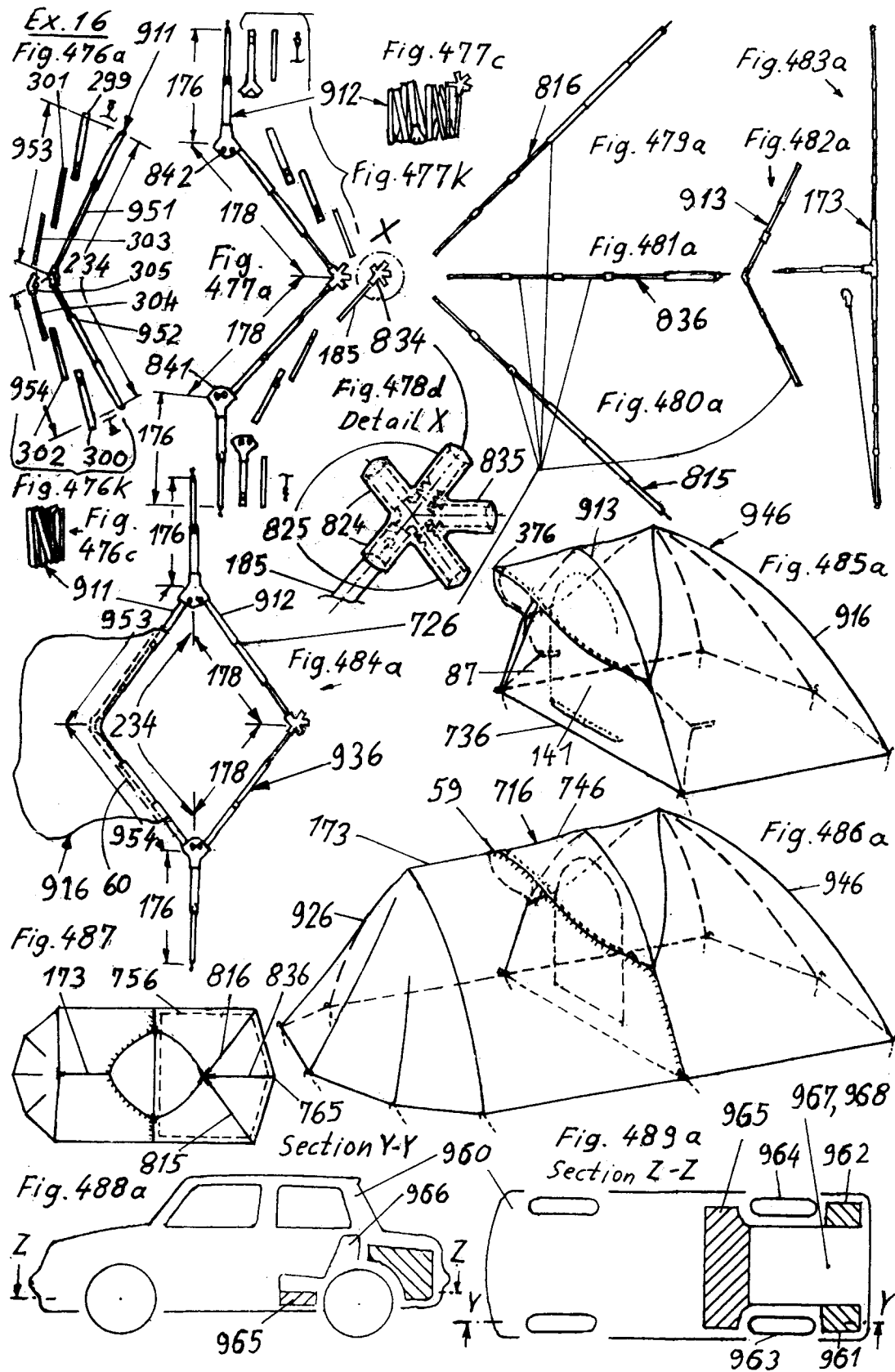






Ex. 15







European Patent  
Office

## EUROPEAN SEARCH REPORT

Application Number  
EP 94 10 7547

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                     |                                                                               |                                                                                                                                                                                                                                                                                       |                                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| Category                                                                                                                                                                                                                | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim                                                                                                                                                                                                                                                                     | CLASSIFICATION OF THE APPLICATION (Int.Cl.6) |
| A                                                                                                                                                                                                                       | DE-U-85 32 830 (FJÄLLRÄVEN SPORTARTIKEL -<br>HANDELSGESELLSCHAFT MBH)<br>---  |                                                                                                                                                                                                                                                                                       | E04H15/40                                    |
| A,D                                                                                                                                                                                                                     | EP-A-0 401 398 (DRÖSCHEL)<br>---                                              |                                                                                                                                                                                                                                                                                       |                                              |
| A,D                                                                                                                                                                                                                     | DE-A-38 20 725 (KOWALSKI)<br>---                                              |                                                                                                                                                                                                                                                                                       |                                              |
| A,D                                                                                                                                                                                                                     | GB-A-1 033 820 (HOLBITZ)<br>-----                                             |                                                                                                                                                                                                                                                                                       |                                              |
|                                                                                                                                                                                                                         |                                                                               |                                                                                                                                                                                                                                                                                       | TECHNICAL FIELDS<br>SEARCHED (Int.Cl.6)      |
|                                                                                                                                                                                                                         |                                                                               |                                                                                                                                                                                                                                                                                       | E04H                                         |
| The present search report has been drawn up for all claims                                                                                                                                                              |                                                                               |                                                                                                                                                                                                                                                                                       |                                              |
| Place of search<br>THE HAGUE                                                                                                                                                                                            |                                                                               | Date of completion of the search<br>28 October 1994                                                                                                                                                                                                                                   | Examiner<br>Clasing, M                       |
| <b>CATEGORY OF CITED DOCUMENTS</b>                                                                                                                                                                                      |                                                                               |                                                                                                                                                                                                                                                                                       |                                              |
| X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document |                                                                               | T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>.....<br>A : member of the same patent family, corresponding document |                                              |