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(54) Device for letting off fireworks

(57) The invention relates to a device for use in letting off fireworks from the ground, comprising holding means (22) for holding fireworks fixedly in the desired position, and support means (23) which are connected to the holding means and which are adapted to support the holding means on the ground, characterized in that the holding means comprise clamping means (27) which hold the firework with a clamping force while it is set off, and wherein the support means comprise at least one lateral support leg (24).

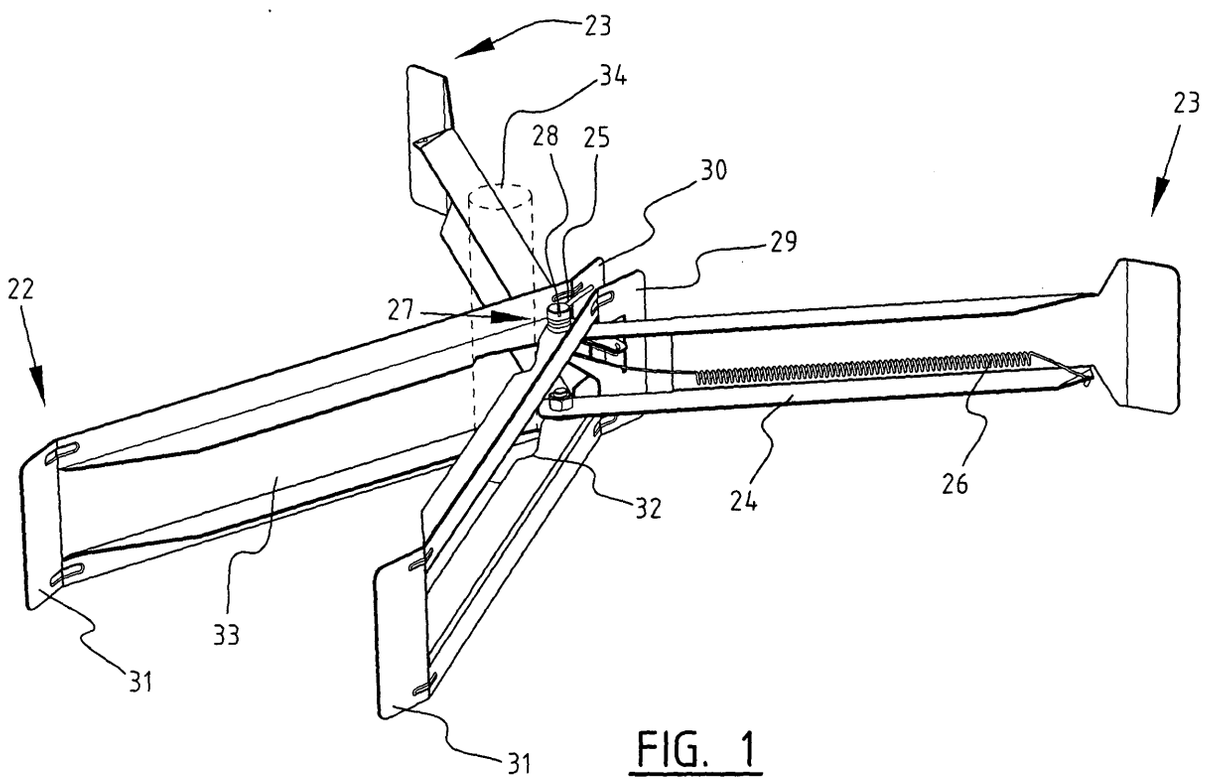

FIG. 1

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Description

[0001] The present invention relates to a device for use in letting off fireworks, comprising holding means for holding fireworks fixedly in the desired position, and support means connected to the holding means for supporting the holding means.

[0002] The invention relates particularly to non-professional setting-off of fireworks. Fireworks are understood to mean particularly fireworks with light effects, such as firework cases, roman candles and rockets.

[0003] It is generally known to use an empty bottle when setting off rockets. The outer end of the rocket is placed in the neck of the bottle. The neck of the bottle ensures that the rocket takes up an almost vertical position when being set off. The bottle is placed with its bottom on the ground and thereby provides a support for the neck of the bottle holding the rocket. This support is not always stable. It sometimes happens that the bottle falls over during setting-off. This can result in dangerous situations. In addition, a bottle is often not suitable for supporting other fireworks, such as firework cases and roman candles. These are often placed directly onto the ground and lit. It is possible for the firework to fall over as it goes off. This can likewise result in a dangerous situation.

[0004] The invention has for its object to provide an assist device for use in letting off fireworks, with which different types of firework can be let off more safely.

[0005] To this end the device is characterized according to the present invention in that the holding means comprise clamping means which hold the firework with clamping force while it is set off, and wherein the support means comprise at least one lateral support leg. Depending on the embodiment, use can be made of a launching tube clamped in the device such that rockets can be let off safely. Particularly rockets and fireworks such as firework cases and roman candles can hereby be set off more safely. As these fireworks go off, it is ensured that the fireworks are supported continuously and do not therefore tip over.

[0006] Clamping force can be achieved in different ways, for instance by making use of gravity or applying a spindle or lock. Preferably however, use is made of a spring force for the clamping force. The spring force can be produced by a spring of preferably steel or elastic material, or by the material with resilient property from which the clamping means are manufactured.

[0007] According to a preferred embodiment of the invention, the clamping means comprise two plate strip ends of metal which are mutually connected close to one outer end. By moving apart the free outer ends of the plate strip ends fireworks can be clampingly received therebetween. The clamp and/or the support means can further also be embodied in other materials, such as steel wire, steel tube, plastic or cardboard.

[0008] A very advantageous and simple device is obtained when the two plate strip ends form the ends of a bent plate strip. A strip-like piece of plate material, preferably of metal, is folded double. The firework can be clamped between the free outer ends of the strip ends.

[0009] A clamping jaw is preferably further provided between the plate strip ends close to the other outer end for the purpose of clampingly engaging a firework. The firework is held clampingly between the outer ends of the plate strip ends even better with the clamping jaw.

[0010] In order that the possibly occurring explosive forces have less influence on the device, the plate strip ends are provided with one or more openings. The air pressure can escape through the opening(s).

[0011] So as to also make the assist means suitable for setting off rockets, the holding means further comprise receiving means for receiving the outer end of a rocket. Rockets must not be held clampingly during setting-off so as to avoid the danger of the device also going into the air during setting-off.

[0012] The device is a portable device. In order to enhance the portability, the support means are preferably connected pivotally relative to the holding means. The support means can be folded up when the device is not in use.

[0013] It is recommended here that the support means are connected at least by means of spring means to the holding means. The advantage hereof is that the support means can be folded out easily. An additional advantage is that when the device is used and the holding means are dirty, for instance because of the combusted gunpowder, these latter do not have to be grasped in order to fold up the support means.

[0014] It is further recommended that the support means are adapted to engage on the holding means for the purpose of opening the holding means counter to the clamping force of the clamping means. The advantage hereof is that the distance between the firework and the person setting it off is increased. This considerably enhances safety. Particularly when the firework placed in the device has not gone off, or not gone off completely, it is important that the firework can be removed from the device without the user having to touch it or having to come very close to it.

[0015] The invention will be further elucidated with reference to the annexed drawings. In the drawings:

Figure 1 shows a perspective view of a first embodiment of a device for use in setting off fireworks according to the invention;
Figure 2 is a perspective view of a second embodiment of the device;
Figure 3 shows a third embodiment of the device;
Figure 4 shows a fourth embodiment of the device;
Figure 5 shows the device of figure 4 in the situation of use; and
Figure 6 shows a fifth embodiment of the device.

[0016] Figure 1 shows a first embodiment of a device for use in setting off fireworks according to the invention.

The device comprises holding means 22 for holding fireworks fixedly in almost vertical position, and support means 23 connected to holding means 22 for supporting holding means 22. Support means 23 are formed in this embodiment by two support legs 24 which are mutually connected on one side by means of a hinge 25. Draw springs 26 are further arranged between hinge 25 and each outer end of support legs 24.

[0017] Holding means 22 comprise clamping means 27 which hold the fireworks with a clamping force during setting-off. In the embodiment shown in figure 1 the clamping means consist of gripper parts 31 and a torsion spring 28. Torsion spring 28 is attached between a first end 29 of a first holding means 22 and a second end 30 of a second holding means 22. Torsion spring 28 thus presses apart the ends 29, 30 of holding means 22. However, because the ends 29, 30 of holding means 22 are situated behind hinge 25, gripper parts 31 of holding means 22 are pressed toward each other, whereby fireworks can be held clampingly. Gripper parts 31 can be opened by exerting a pressing force on the outer ends of holding means 29, 30 or by exerting a pressing force on the outer ends of support means 23. Support means 23 then press against the outer ends 29, 30 of the holding means, whereby gripper parts 31 move apart. Holding means 22 are further provided with recesses 32 which together form a receiving cavity in which fireworks or a launching tube for fireworks 34 with a relatively small diameter can be received. Launching tube 34 can be placed in recess 32. Rockets can be fired from this launching tube 34 without clamping force and almost vertically. Openings 33 are arranged in holding means 22 so that gases which may be released during setting-off can escape easily. This also helps to prevent the device falling over.

[0018] The second embodiment of the device of figure 2 is manufactured from metal, preferably stainless steel. The device consists of two plate strip ends 8 which are mutually connected close to one outer end 9. Outer end 9 acts as a hinge, and over this hinge is arranged a leaf spring 10. The plate strip ends 8 are cut and bent on the underside to form lateral support legs 15. The firework is clamped between the free ends of plate strip ends 8.

[0019] Shown once again in figure 3 is a device which consists of two plate strip ends 8 of metal. At the outer end 9 the plate strip ends 8 can pivot relative to each other on hinge 4. The free ends of plate strips 8 end in semicircular gripper parts 23 which together form a clamping jaw 11 for clampingly engaging fireworks. Compared to the second embodiment of figure 2, the device of figure 3 has the advantage that clamp holding of the firework is even better between the outer ends of plate strip ends 8.

[0020] Support means 2 are formed by support legs 12 pivotable about hinge 4. When the device is not in use, support legs 12 can be folded up against the outside of plate strip ends 8.

[0021] A further difference from the embodiments shown in figures 1 and 2 is that in the third embodiment of figure 3 the spring force required to hold fireworks clampingly is produced by the material with resilient property from which clamping means 6 are manufactured. Clamping means 6 are the two plate strip ends 8 manufactured from metal, preferably stainless steel. By embodying the plate strip ends 8 with predetermined thickness and mutually connecting thereof close to outer end 9 a resilient action is obtained for holding fireworks clampingly in clamping jaw 11.

[0022] Finally, a ridge 17 is arranged in each plate strip end 8 in the embodiment of figure 3. Ridges 17 together form a receiving cavity in which fireworks of relatively small diameter, such as a roman candle, can be clamped.

[0023] Figures 4 and 5 show a further embodiment of the device according to the invention. In figure 4 the device is shown when not in use, while in figure 5 the device is shown in the position of use. The device is manufactured from one plate strip 22 which is bent close to the one end 9 so that the outer ends of plate strip 22 form two plate strip ends 8. Plate strip ends 8 are provided with openings 18 extending substantially over the whole length thereof. The air displaced during an undesired explosion can escape through openings 18.

[0024] A part of the material of plate strip ends 8 is removed in order to form openings 18. Another part thereof is bent to form a clamping jaw 11. This clamping jaw 11 consists of four bent plate portions 19, each provided with two V-shaped grooves 13,14 of different dimensions. More or fewer than two grooves per plate portion 19 is of course also possible. It is generally the case that the closer the groove lies to the outer end 9, the greater the clamping force that is available.

[0025] At the top and bottom the plate portions 19 are not at the same height: they lie one directly above the other so that the V-shaped grooves 13,14, as seen from above, do not form any openings when clamping jaw 11 is closed. This "overbite" prevents rockets being positioned at the front side of the device. At this position rockets have too little stability to be set off safely.

[0026] The two smaller, opposite V-shaped grooves 14 of plate portions 19 lying at almost the same height form a receiving cavity for fireworks of a relatively small diameter, such as roman candles. Fireworks of a relatively large diameter, such as firework cases, are engaged by the larger V-shaped grooves 13 as shown in figure 5.

[0027] With the clamping jaw 11 of figures 4 and 5 there is less contact surface area between the firework and the device, so that an explosive force possibly occurring during setting-off will also be transmitted to a lesser extent to the device. This ensures an even better stable support of the firework as it goes off.

[0028] The shortest distance between the free outer edge of each plate portion 19 of clamping jaw 11 and the associated plate strip end 8 amounts to at least 0.5 cm, preferably 0.75 cm, and more preferably to at least

1 cm.

[0029] This device is also provided with support means in the form of punched-out and bent support legs 15.

[0030] Figure 6 finally shows yet another embodiment of the invention. This embodiment greatly resembles the embodiment of figures 4 and 5. An important difference however is that in figure 6 two plate strip ends 8 are used to form the device. Plate strip ends 8 are fixed to each other close to one outer end 9, for instance by means of spot welding. The length along which plate strip ends 8 are fixed to each other determines the magnitude of the spring force, and therefore the magnitude of the clamping force of clamping jaw 11 on the other end. Plate strip ends 8 taper increasingly from the middle of the device. Just as in the devices of figures 2 and 4, support legs 15 are here punched out and bent on the underside of plate strip ends 8.

[0031] Another difference from the device of figures 4,5 is that receiving means 16 are provided for receiving the outer end of a rocket. Receiving means 16 are formed by semicircular eyes 21. The eyes 21 are punched out of a plate strip end 8. The other plate strip end 8 can likewise be provided with such eyes 21, preferably of another dimension. Rockets for different heights, which have different sizes of stick, can hereby be accommodated. Eyes 21 are positioned almost in the middle of the cross-like device, whereby the rocket can be held with great stability in an almost vertical position. The rocket can therefore be set off more safely than if an empty bottle were used. It is undesirable here to exert a clamping force on the rocket, since there is the danger of the device also going into the air during setting-off.

[0032] The desired stability required to set off fireworks safely is provided in the embodiments of figures 1-6 by the cross-like configuration of the device.

Claims

1. Device for use in letting off fireworks from the ground, comprising holding means for holding fireworks fixedly in the desired position, and support means which are connected to the holding means and which are adapted to support the holding means on the ground, **characterized in that** the holding means comprise clamping means which hold the firework with a clamping force while it is set off, and wherein the support means comprise at least one lateral support leg.

2. Device as claimed in claim 1, **characterized in that** the support means comprise two support legs which are connected to the holding means such that, at least in use, the device has a cross-like configuration.

3. Device as claimed in claim 1 or 2, **characterized in that** use is made of a spring force for the clamping force.

4. Device as claimed in claim 3, **characterized in that** the spring force is produced by a spring.

5. Device as claimed in claim 3, **characterized in that** the spring force is produced by the material with resilient property from which the clamping means are manufactured.

6. Device as claimed in any of the claims 1-5, **characterized in that** the clamping means comprise two plate strip ends which are mutually connected close to one outer end.

7. Device as claimed in claim 6, **characterized in that** the two plate strip ends form the ends of a bent plate strip.

8. Device as claimed in claim 6 or 7, **characterized in that** a clamping jaw is provided between the plate strip ends close to the other outer end for the purpose of clampingly engaging a firework.

9. Device as claimed in any of the claims 6-8, **characterized in that** the plate strip ends are provided with one or more openings.

10. Device as claimed in any of the claims 1-9, **characterized in that** the holding means further comprise receiving means for receiving the outer end of a firework rocket.

11. Device as claimed in any of the claims 1-10, **characterized in that** the support means are connected pivotally relative to the holding means.

12. Device as claimed in any of the claims 1-11, **characterized in that** the support means are connected to the holding means by means of spring means.

13. Device as claimed in any of the claims 1-12, **characterized in that** the support means are adapted to engage on the holding means for the purpose of opening the holding means counter to the clamping force of the clamping means.

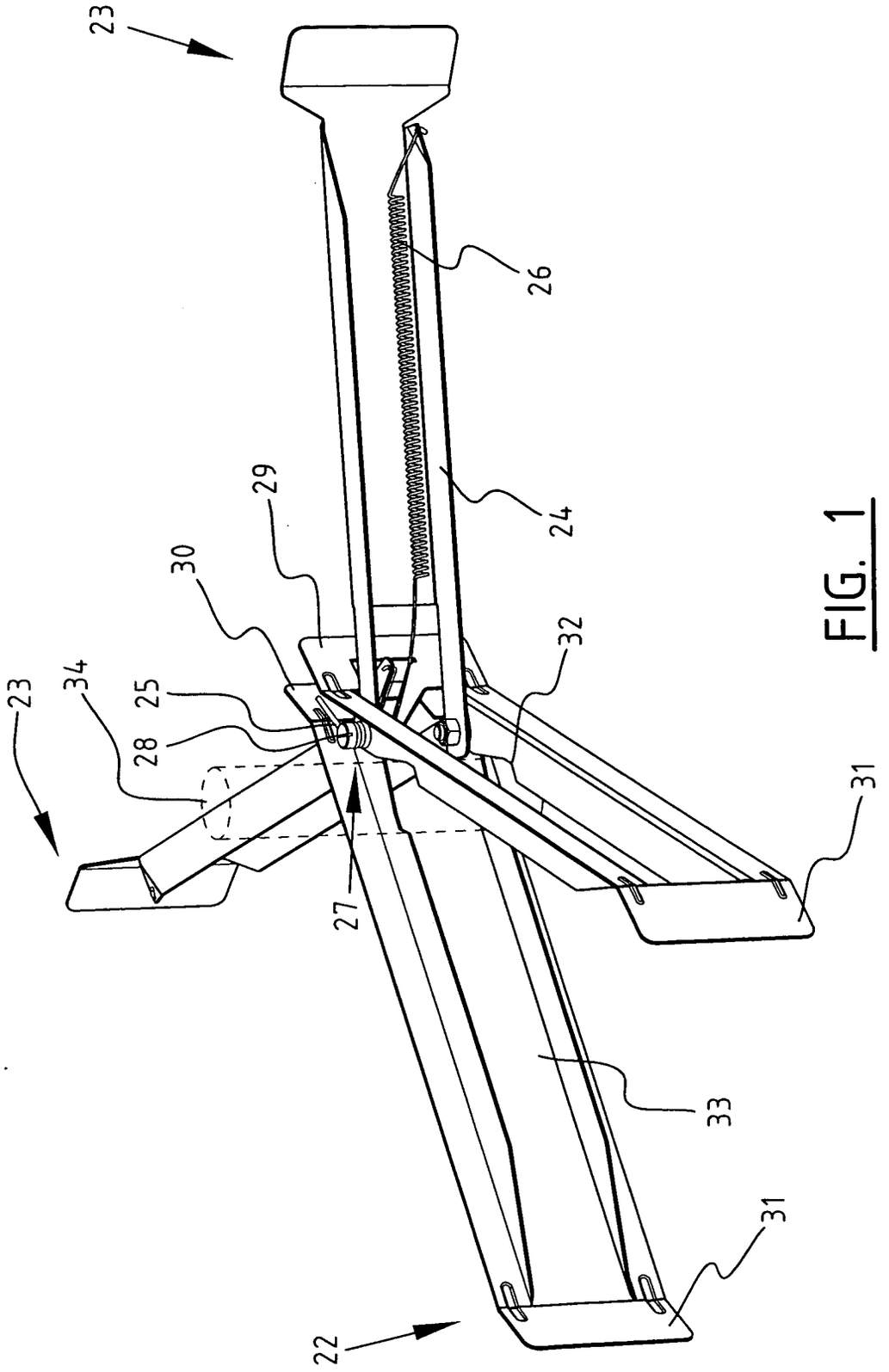

FIG. 1

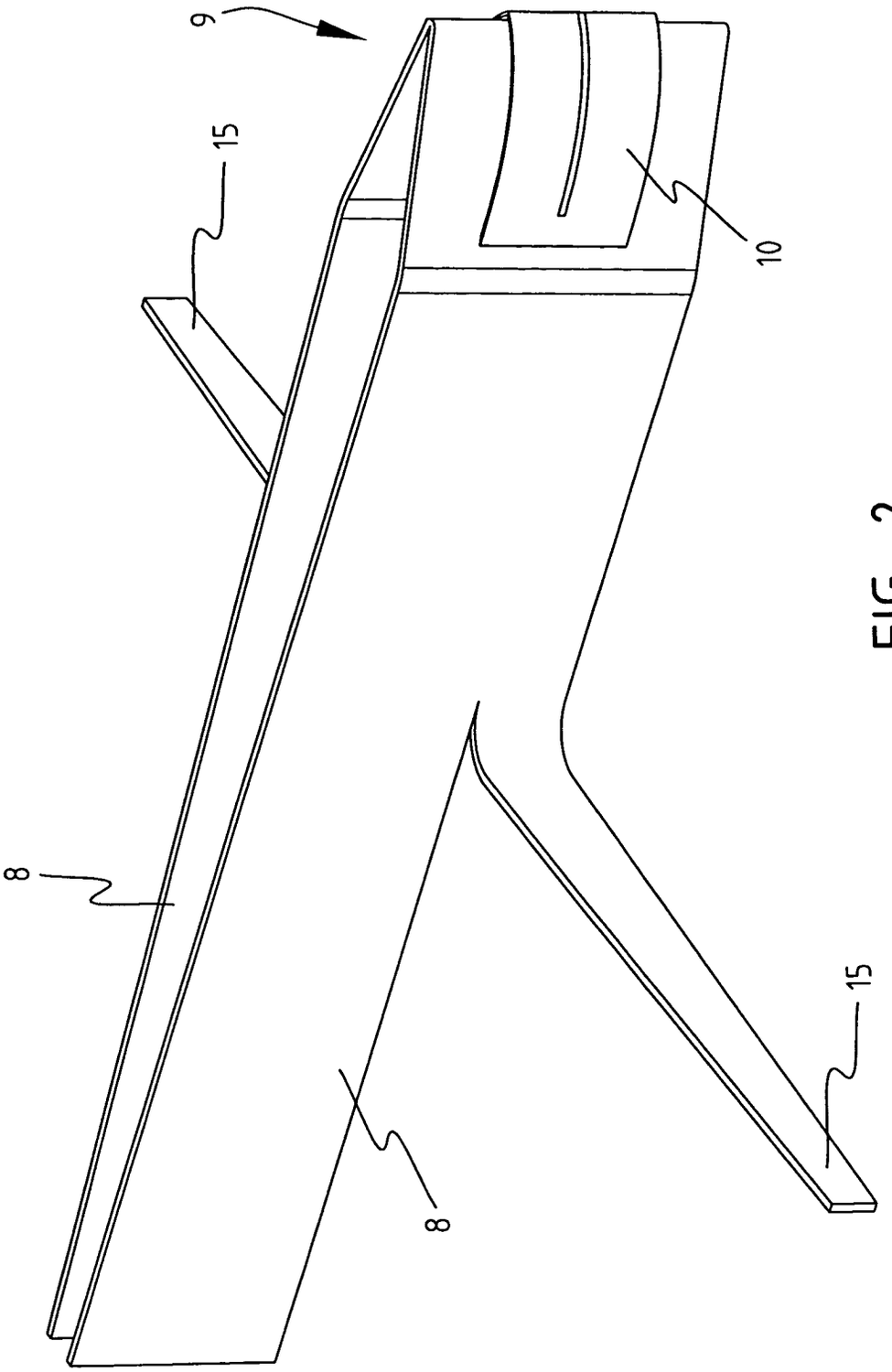

FIG. 2

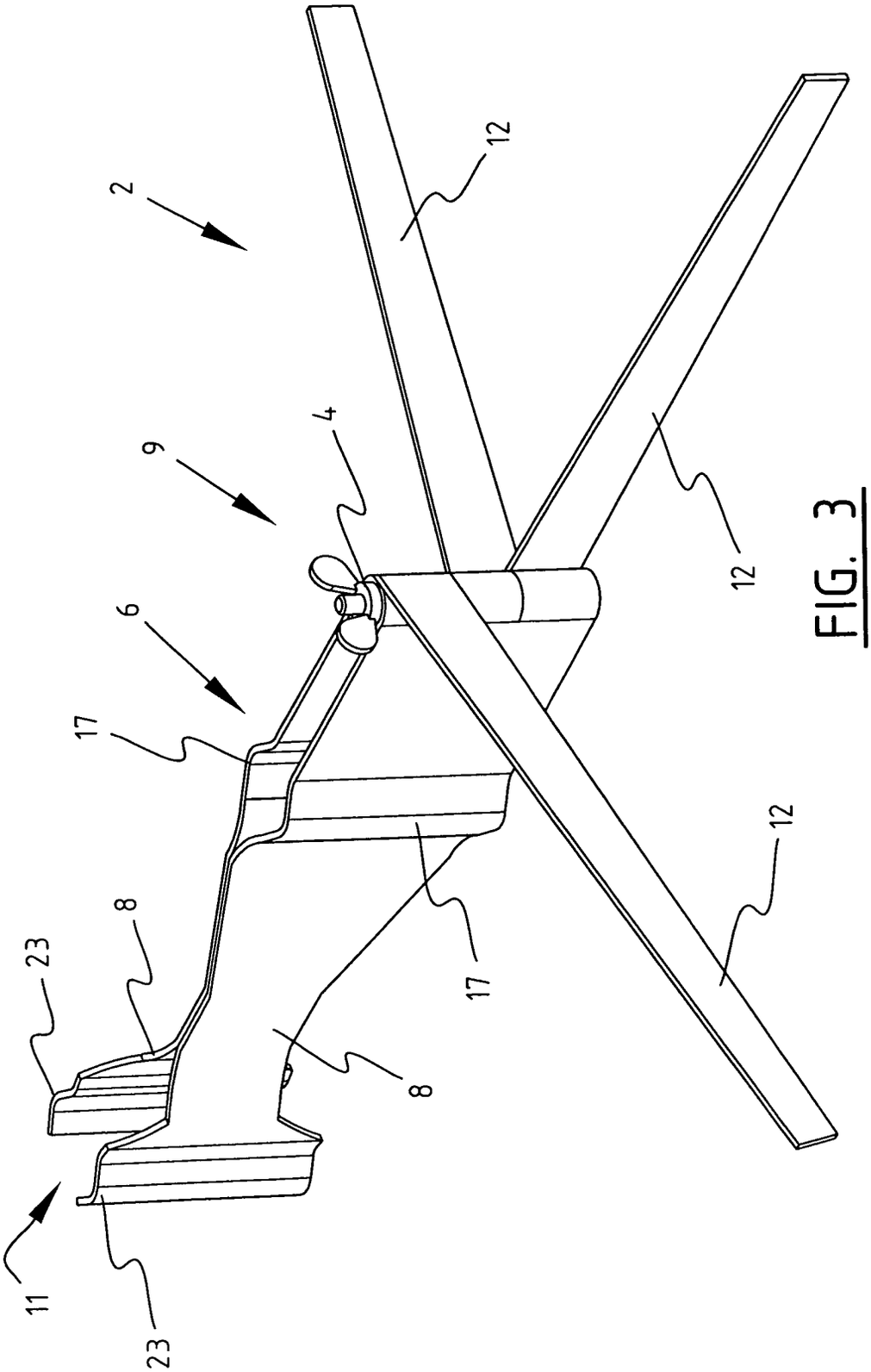

FIG. 3

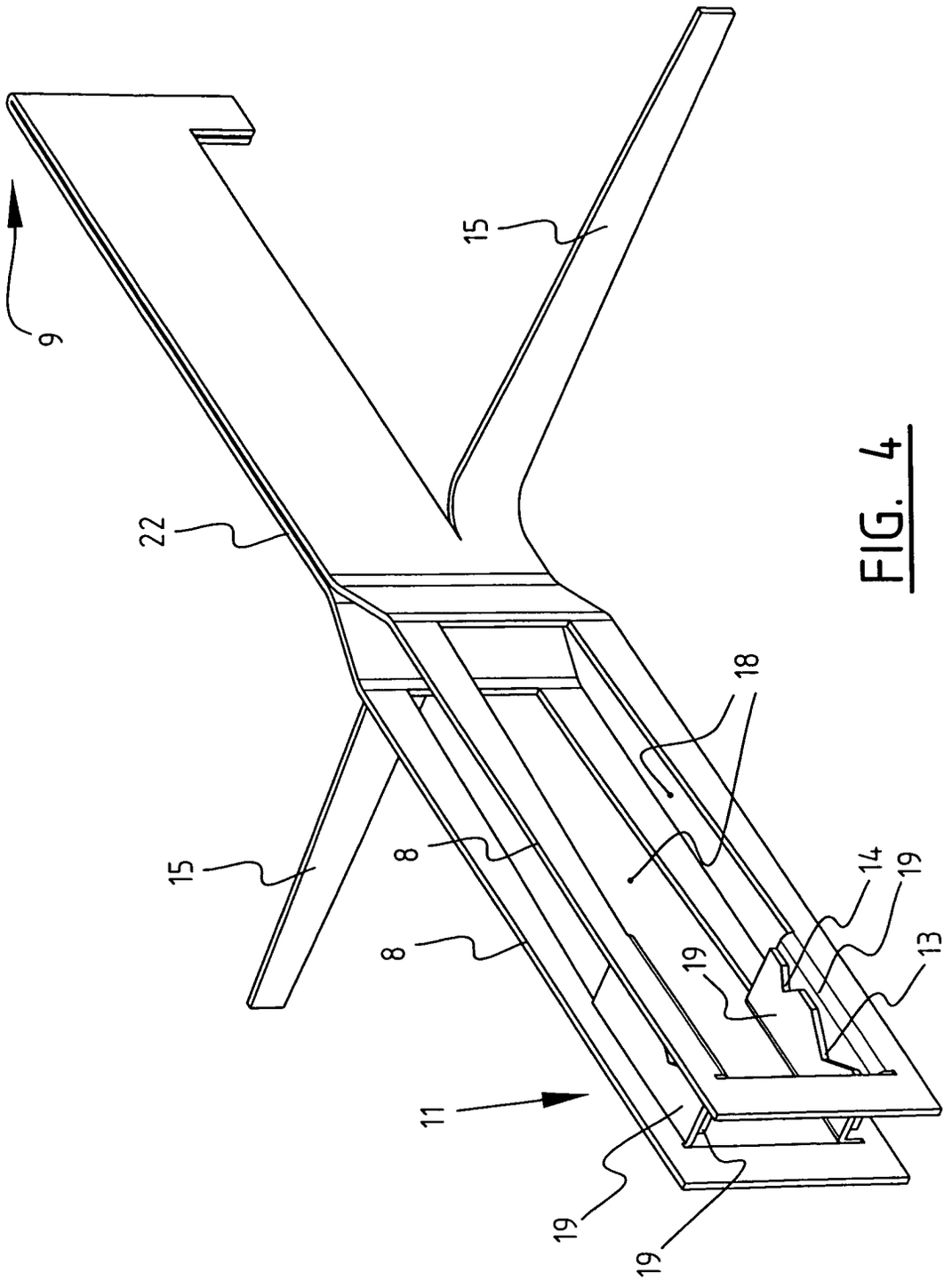

FIG. 4

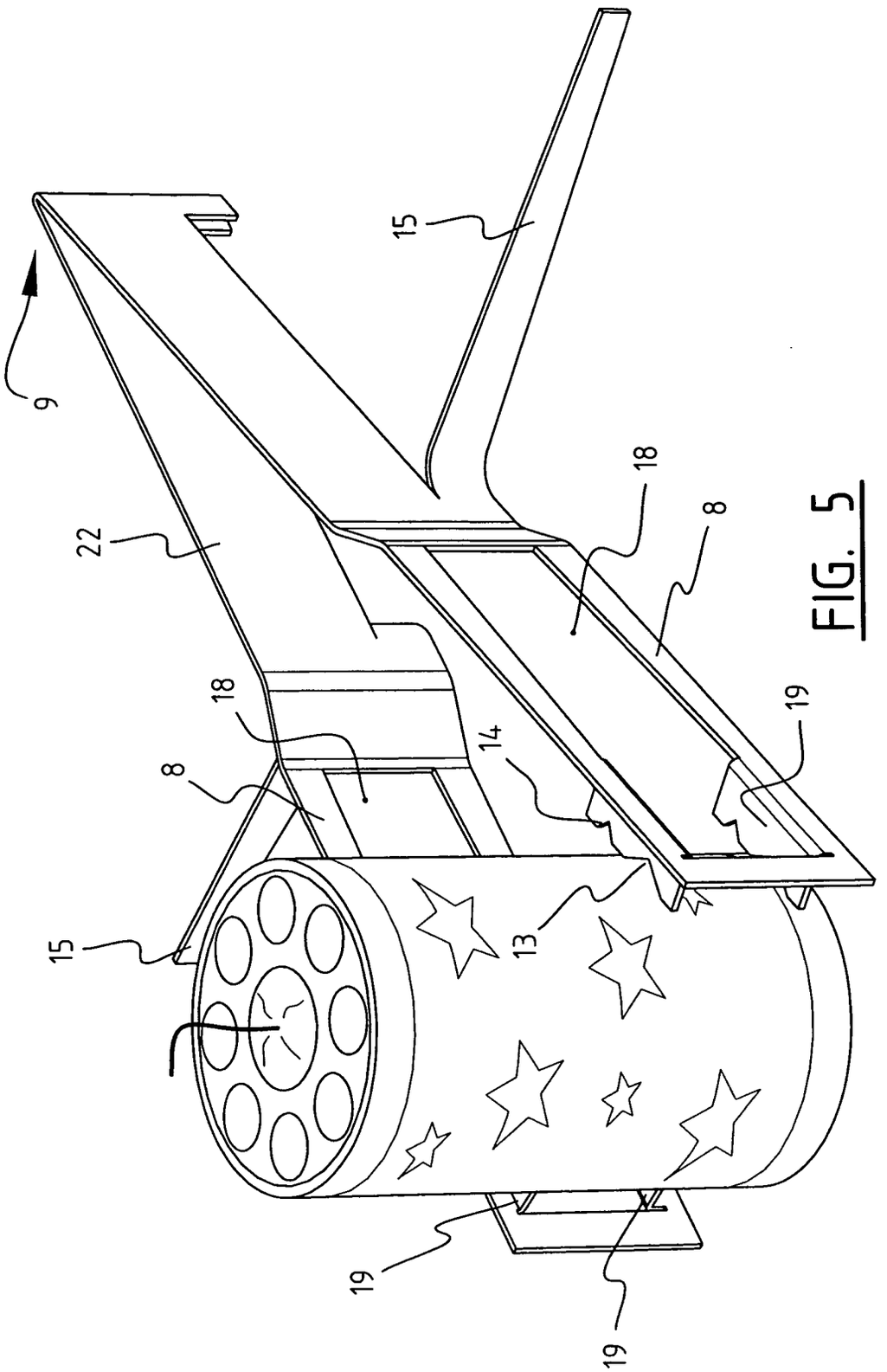

FIG. 5

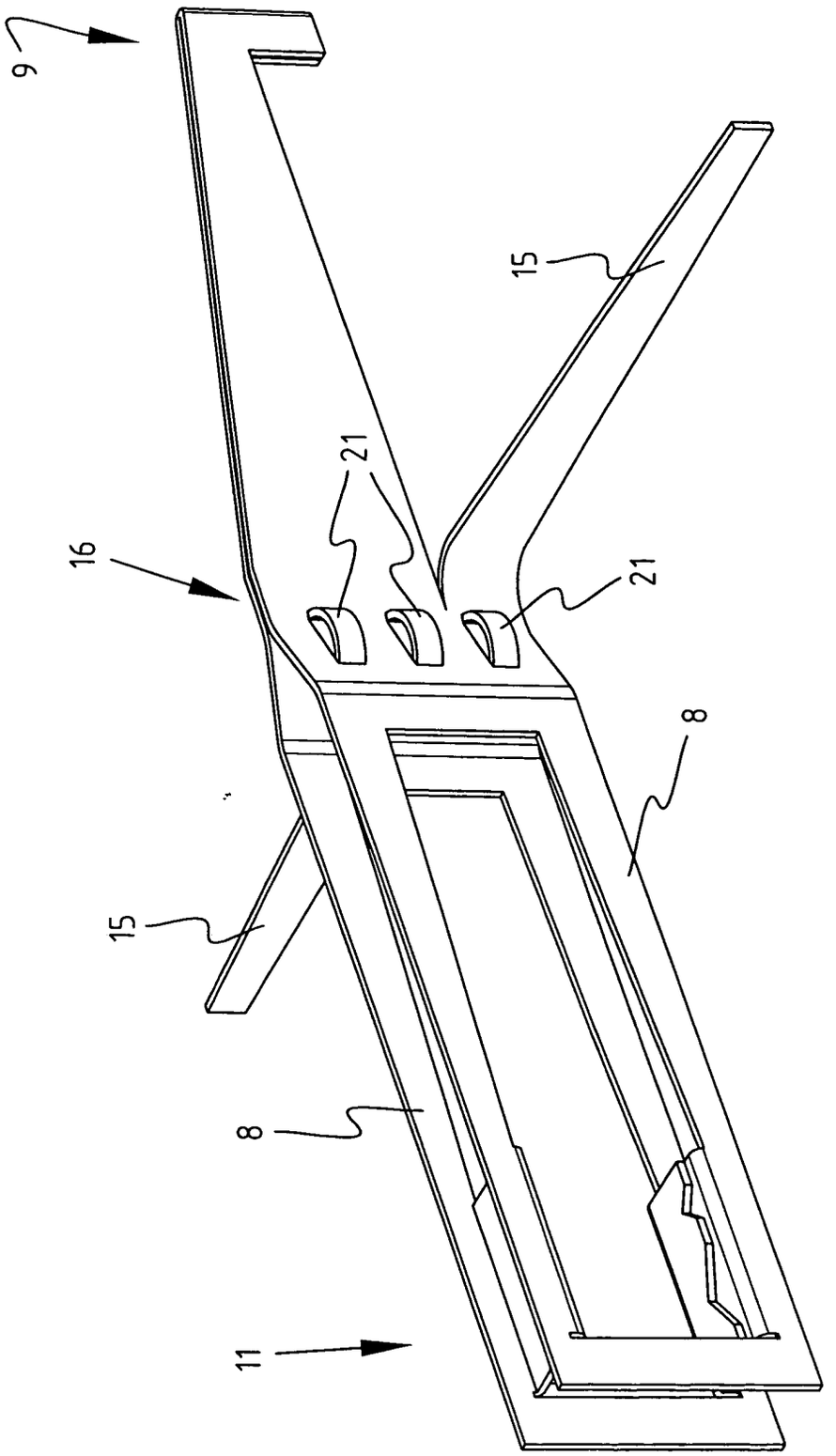

FIG. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 04 07 7222

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	11 November 2004	Giesen, M

CATEGORY OF CITED DOCUMENTS

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