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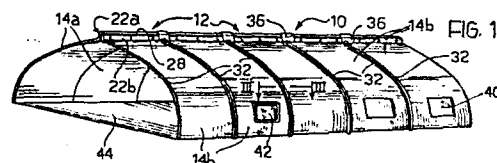
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(54) **Tunnel shed.**

(57) A tunnel-shaped shed is provided which is made up of a number of aligned and interconnected modular flat arch elements (12). Each arch element (12) is constituted by two opposed semi-arches (14a, 14b) provided with mating ridge portions (22a, 22b). In order to reduce the number of shed components required to provide a weather-proof construction, the ridge portion (22a) of one semi-arch (14a) of each arch element (12) has an integral edge strip (28) which serves to cover the ridge portion (22b) of the other semi-arch (14b) in the manner of a tile. Furthermore, the lateral edges of the semi-arches (14a, 14b) are shaped in such a way as to inter-engage along corresponding lateral edges of adjacent semi-arches (14a, 14b). Joint covers (36) engage over the adjacent ends of the ridges of adjacent arch elements (12)).



"Tunnel shed"

The present invention relates to a shed in the form of a tunnel, of the type comprising a self-supporting body constituted by an aligned and interconnected series of modular flat arch elements.

5 The object of the present invention is to provide a shed of the above-defined type composed of a reduced number of elements which can be assembled together in a particularly simple and rapid manner without requiring the use of special tools or specialist personnel.

10 With a view to achieving this object, the subject of the present invention is a shed in the form of a tunnel of the type initially specified, characterised by the following combination of features:

15 a) each arch element is constituted by two opposed semi-arches each formed by a shaped panel comprising two outer walls of glass-reinforced resin and an intermediate layer of insulating material,

20 b) the two semi-arches of each arch element are provided at the top with respective terminal ridge portions extending vertically upwards and fitting together, the ridge portion of one of the two semi-arches having at the top an integral longitudinal edge strip which covers the top of the ridge portion of the other semi-arch in the manner of a roofing tile,

25 c) a joint cover engages, by form coupling, over the adjacent ends of the ridge portions of adjacent arch elements,

30 d) the lateral edges of the semi-arches of each arch element are formed in such a way as to interengage with corresponding lateral edges of the semi-arches of the adjacent arch element.

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Due to this inventive concept the shed according to the invention is extremely light and, when dismantled, it has a very limited bulk which facilitates its storage and transport. The presence of the longitudinal edge strips with
5 which one of the semi-arches of each arch element is provided permits the number of pieces necessary for assembly of the shed to be reduced, making the use of longitudinal junction elements between the various semi-arches superfluous.

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When assembled, the shed according to the invention has a self-supporting body structure having a shape similar to that of an inverted boat hull. In such assembled condition the shed is impervious to atmospheric agents
15 and, when dismantled, it can be totally recovered and re-utilised.

Preferably, the tops of the ridges of the two semi-arches of each arch element are inclined and converge
20 upwardly, and the said longitudinal edge strip of the ridge portion of one of the two semi-arches is inclined at the same angle as the top of the ridge portion of the other semi-arch.

In this way the top of the shed has a sloping roof configuration which prevents the accumulation of rain or
25 snow. The shed according to the invention can advantageously be used as a store or shelter, particularly for zootechnical, civil, industrial or military use.

30 The invention will now be described in detail with reference to the appended drawings, provided purely by way of non-limitative example, in which:

Figure 1 is a perspective view of a shed in the form of

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a tunnel, according to the invention;

Figure 2 is a perspective view on an enlarged scale, and partly cut away, illustrating a section of the upper
5 part of the shed; and

Figure 3 is a longitudinal section on an enlarged scale, and partially cut away, taken on the line III-III of Figure 1.

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The tunnel-form shed according to the invention, generally indicated 10 in Figure 1, is constituted by a self-supporting body formed by a plurality of aligned modular elements 12. Each modular element 12 is in the form of
15 a flat arch constituted by two opposed semi-arches 14a, 14b. Each semi-arch 14a, 14b is constituted by a curved rectangular panel having a "sandwich" structure formed by two outer walls 16a, 16b and 18a, 18b connected together along their respective edges, and by
20 an intermediate layer 20a, 20b of thermally insulating material. The outer walls 16a, 16b and 18a, 18b are made of a non-inflammable reinforced plastics material having a high strength, for example glass-reinforced resin, whilst the intermediate layer 20a, 20b can be
25 made for example of polyurethane or expanded polystyrene, glass wool or rock wool.

The upper edges of the two semi-arches 14a, 14b of each arch element 12 are turned vertically upwardly in such a
30 way as to form two inter-engaging longitudinal ridge portions 22a, 22b. The ridge portions 22a, 22b constitute two coupling flanges and are rigidly connected together by means of transverse fixing through bolts 24 and/or by glueing.

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As is illustrated in detail in Figure 2, the tops of the ridge portions 22a, 22b of each pair of semi-arches 14a, 14b have inclined upwardly-converging surfaces 26a, 26b. Moreover, the ridge portion 22a of the arch 14a has
5 has an integrally moulded longitudinal edge strip 28 extending out from the upper edge of the inclined surface 26a and bent over in such a way as to cover the inclined surface 26b of the other semi-arch 14b in the manner of a roofing tile. In effect, the edge strip 28 is
10 inclined at the same angle as the surface 26b, and defines with the inclined surface 26a a sloping roof structure which prevents the ingress of dust, water and other atmospheric agents into the interior of the shed 10 through the junction region in the various semi-
15 arches 14a, 14b. It is clear that the surfaces 26a, 26b and the edge strip 28 could have a different configuration from that described above, for example a flat horizontal configuration. However the solution illustrated is to be considered as the preferred one
20 since it effectively prevents the accumulation of water or snow on the ridge of the shed 10.

The adjacent arch elements 12 are coupled together laterally by being inter-engaged. In fact, as illustrated in detail in Figure 3, one of the lateral edges of each
25 semi-arch 14b (14a) has a projection 30 turned orthogonally outwardly of the outer wall 16b (16a), whilst the other lateral edge has an outwardly-projecting channel-shaped terminal part 32 which has its cavity facing the interior of the shed 10, and includes a
30 final section 34 turned parallel to the outer wall 16b (16a). The projection 30 of each semi-arch 14b (14a) is housed in the cavity of the channel part 32 of each adjacent semi-arch 14b (14a), and the final section 34 lies against the surface of the outer wall 16b (16a)
35 of this adjacent semi-arch 14b (14a). Since the width of the channel section end parts 32 is substantially greater than the thickness of the projections 30, a

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a large amount of play is obtained between these parts 30 and 32, which allows possible irregularities in the ground to be absorbed upon assembly of the shed 10.

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The reference numeral 36 indicates joint covers, also made of a reinforced plastics material, form fitted over the facing ends of the ridge portions 22a, 22b of the adjacent arch elements 12. As is illustrated in detail in Figure 2, each joint cover 36 has a shape complementary to that of the ridge portions 22a, 22b and is provided with respective channel-shaped turned-up end parts 38 which overlie, by means of a form coupling, the upper ends of the lateral channel parts 32 of the corresponding arch elements 12.

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The shed 10 can be provided with apertures or lateral windows 40, 42 formed upon manufacture of the semi-arches 14a, 14b and can also be provided with air domes and ceilings not illustrated in the drawings.

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The shed 10 can also be provided at the bottom with a floor 44 connected to the inner walls 18a, 18b by means of any conventional system, and with transverse end walls, not illustrated in the drawings, provided with access doors.

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From the above it is evident that the support structure of the shed according to the invention is formed by a very small number of components which can be assembled and dismantled in a simple and rapid manner. This structure is moreover particularly light and robust and impervious to atmospheric agents, and therefore lends itself advantageously to a wide variety of different uses

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in the civil, industrial and military fields.

Naturally the effects of the present invention extend
to models which achieve the same utility by means of
5 the same inventive concept.

CLAIMS

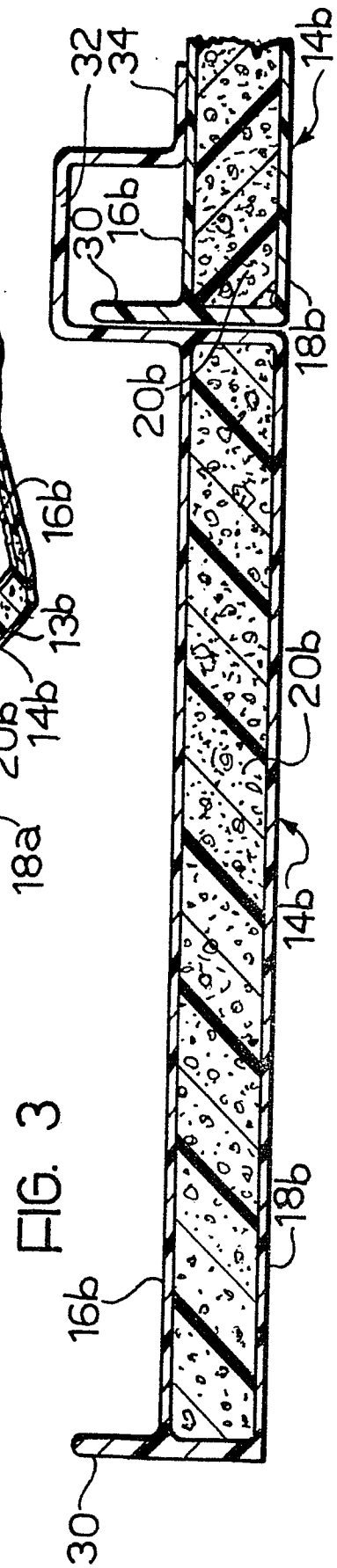
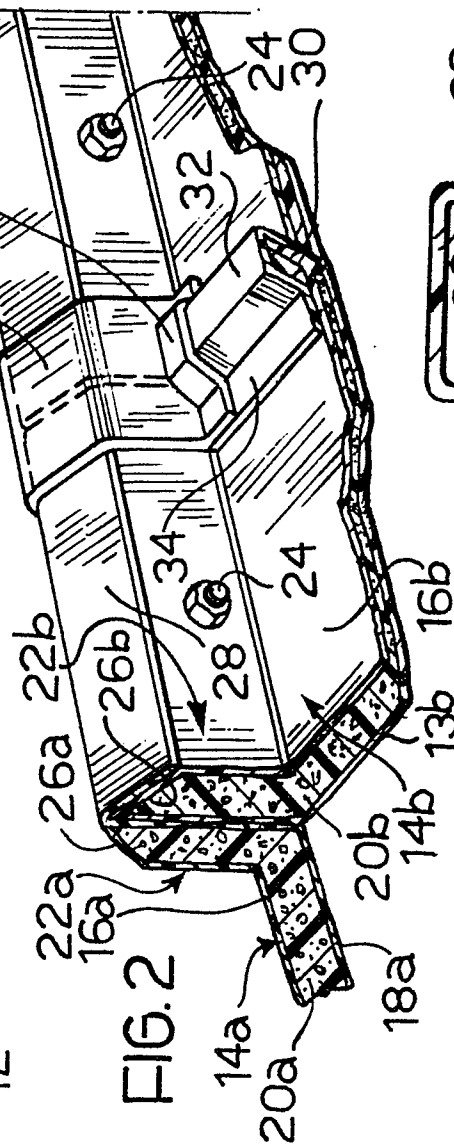
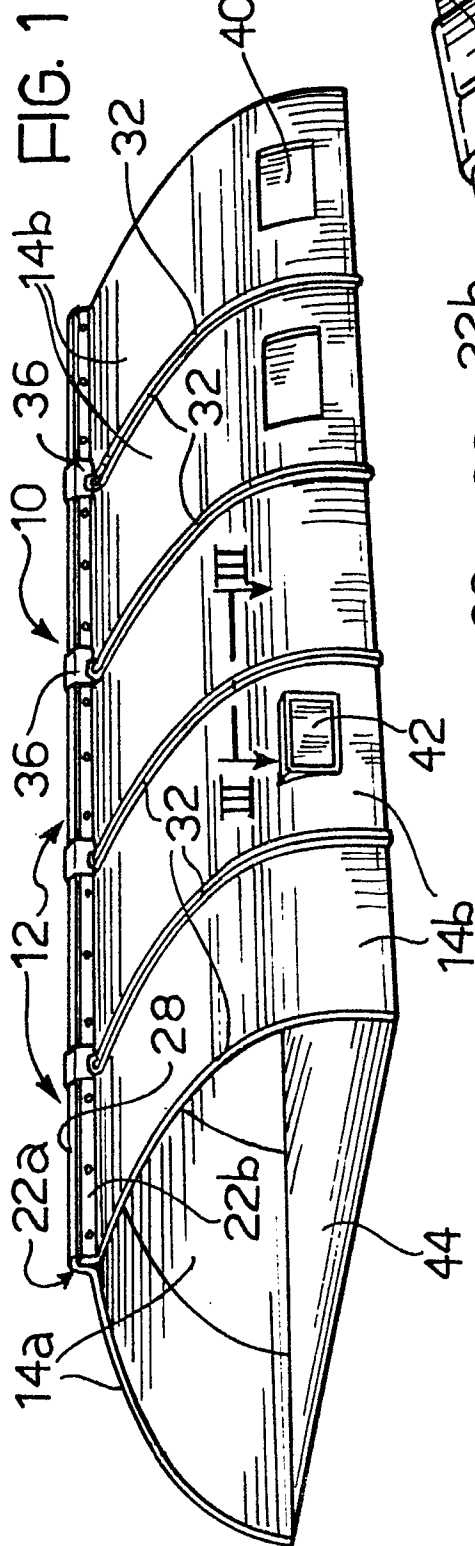
1. A shed in the form of a tunnel comprising a self-supporting body (10) constituted by a series of aligned interconnected modular flat arch elements (12), characterised by the following combination of features:

- 5 a) each arch element (12) is constituted by two opposed semi-arches (14a, 14b) each formed from a shaped panel comprising two outer walls of glass reinforced resin (16a, 18a; 16b, 18b) and an intermediate layer (20a, 20b) of insulating material,
- 10 b) the two semi-arches (14a, 14b) of each arch element (12) are provided at the top with respective terminal ridge portions (22a, 22b) extending vertically upwardly and fitting together, the ridge portion (22a) of one of the two semi-arches (14a) having at
- 15 its top (26a) an integral longitudinal edge strip (28) which covers the top (26b) of the other semi-arch (14b) in the manner of a roofing tile,
- c) a joint cover (36) engages by form coupling the adjacent ends of the ridge portions (22a, 22b)
- 20 of adjacent arch elements (12), and
- c) the lateral edges of the semi-arches (14a, 14b) of each arch element (12) are shaped in such a way as to inter-engage along corresponding lateral edges of the adjacent semi-arches (14a, 14b) of the adjacent arch
- 25 element (12).

2. A shed according to Claim 1, characterised in that the tops (26a, 26b) of the ridge portions (22a, 22b) of the two semi-arches (14a, 14b) of each arch element

30 (12) are inclined and converge upwardly, and in that the said longitudinal edge strip (28) of the ridge portion (22a) of one of the two semi-arches (14a) is inclined at the same angle as the top (26b) of the ridge portion (22b) of the other semi-arch (14b).

3. A shed according to Claim 1 or Claim 2, characterised in that the ridge portions (22a, 22b) of the two semi-arches (14a, 14b) of each arch element (12) are rigidly connected together.
- 5 4. A shed according to Claim 3, characterised in that the connection is formed by threaded means (24).
5. A shed according to Claim 3 or Claim 4, characterised in that the connection is formed by means of glueing.
- 10 6. A shed according to Claim 1, characterised in that one of the lateral edges of each semi-arch (14a, 14b) has an outwardly directed projection (30), whilst the other lateral edge has an outwardly projecting
- 15 terminal part in the form of a channel (32) which has its cavity facing inwardly and includes a final section (34) extending parallel to the outer surface (16a, 16b) of the semi-arch (14a, 14b); the cavity of the said terminal channel part (32) housing the projection (30)
- 20 of the adjacent semi-arch (14a, 14b) with substantial play.
7. A shed according to Claim 6, characterised in that each joint cover (36) has respective channel-
- 25 shaped turned-up end parts (38) which overlie, by means of a form coupling, the upper ends of the channel section lateral parts (32) of the corresponding semi-arches (14a, 14b).
- 30 8. A shed according to Claim 7, characterised in that the joint covers(36) are made of reinforced plastics material.





European Patent
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EUROPEAN SEARCH REPORT

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Application number

EP 82 83 0093

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. ³)
A	FR-A-2 396 137 (ETAT FRANCAIS) *The whole document*	1, 3, 4	E 04 B 1/32
A	DE-A-1 937 330 (JACHMANN) *Page 2, paragraph 6; figure 4*	1	
A	GB-A- 819 047 (PEDLEY) *Page 1, lines 44-51, 80-84; page 2, lines 20-30; figure 1*	1, 2	
A	GB-A- 569 438 (ENFIELD ROLLING MILLS) *Page 3, lines 17-35, 101-122; figures 1-3*	1	
A	DE-A-1 922 364 (KELLERHOFF) *In particular figure 2*	1-6	TECHNICAL FIELDS SEARCHED (Int. Cl. ³)
			E 04 B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 07-12-1982	Examiner CAVALERI S.P.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			