



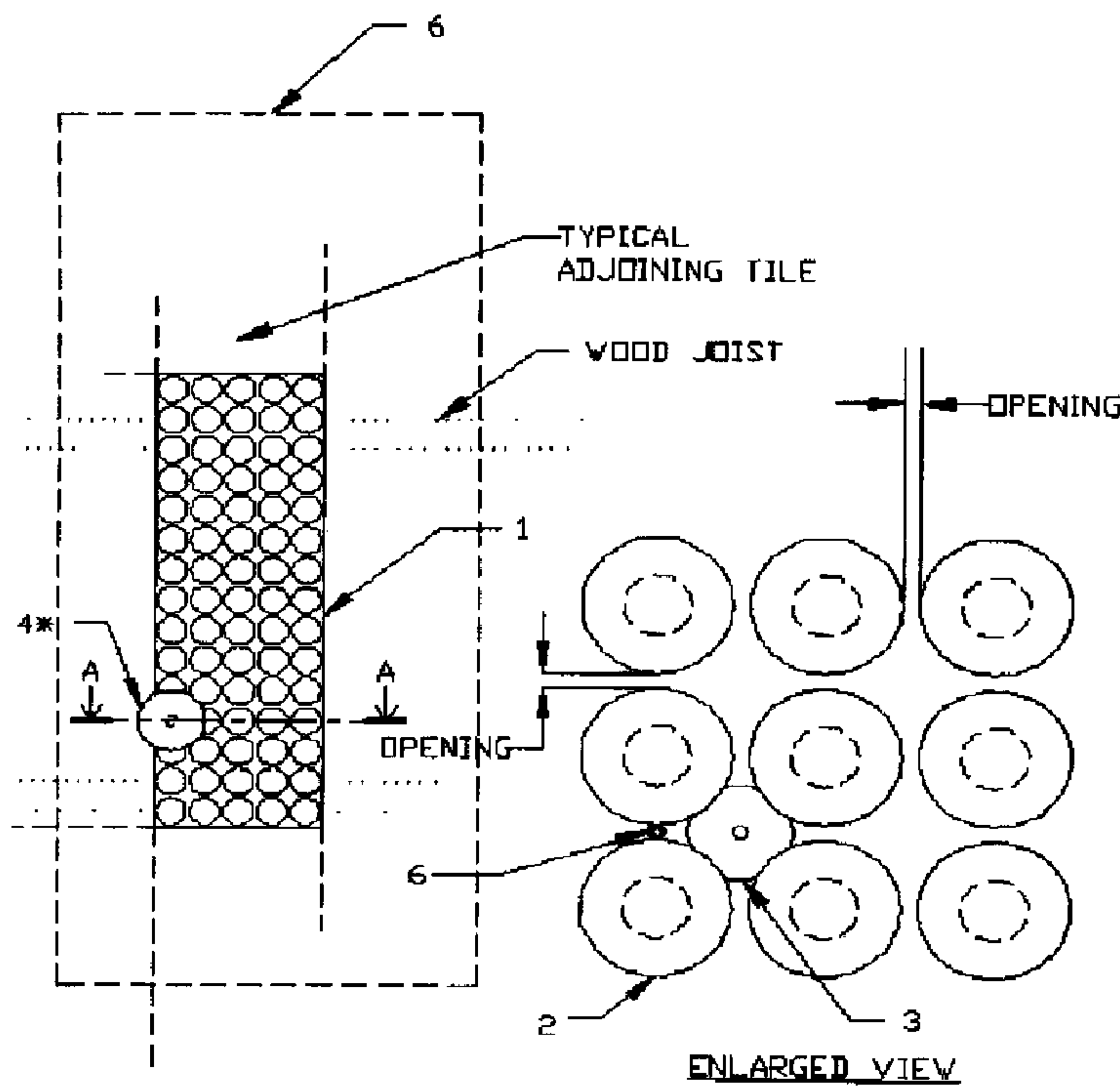
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(54) Titre : CARREAU DE PLAFOND
(54) Title: CEILING TILE



**BOTTOM VIEW OF THE CEILING TILE (1)
(SINGLE CARRIAGE (3) SHOWN)
(*) = OPTIONAL ITEMS**

(57) **Abrégé/Abstract:**

Brief assistive devices industry background summary Many hospital patients and senior citizens lack mobility freedom. There are many various assistive devices which aid in the movement and transport of these physically challenged individuals. To name a few



(57) **Abrégé(suite)/Abstract(continued):**

assistive devices, there are wheelchairs, walkers, scooters and walking sticks. At some point during transport movement, they require transfers from these assistive devices to a bed, bathtub, sofas, automobiles, public pools etc. Continuously lifting patients have caused many back injuries at homes and hospitals and because of this, all hospitals have initiated a zero lift policies for the practicing nurses. Manufacturers have come far by developing and selling various lifting devices which are rolled to the bed, car etc and a small actuator lifts the patients up or down. Other ways are use of ceiling lifts to avoid slippery floors or frictional surfaces such as carpets etc, in which a motorized lifting device is attached with a strap to a ceiling track. The track itself is made out of an extruded metal. Inside the track rolls a 6 wheeled carriage. The carriage also acts like a lifting pivot and provides a single directional movement function to transfer patients to the desired locations, but limited only to where the tracks are laid track. In my invention the freedom to position and transfer patients, anywhere is greatly enhanced. This raises the mobility as well as the standard of living for a maturing population which is a growing trend. The market demographics for this product are very strong as the baby boomers are retiring. Expanding on the existing Problem The main purpose of the problem was overcome some disadvantages and difficulties associated with the track lift systems. The track system provided motion in the direction where the tracks are permanently installed. The lifting positions were limited to where the tracks were installed. More tracks were necessary if they were needed to reach certain areas like a bath tub, toilet etc. and if the track crossed one another then they had to have a mechanical turntable installed at the cross-over junction to allow a change in direction. More over, the track looks ugly with protruding rail in the ceiling. Objectives The challenge was to make the track available in any area of a room and avoiding the rotational directional change. They also had to have an appealing decorative and a pleasing look. It also had to accommodate existing motor lifts which are available in the market. The design had to be strong to carry patient weights and offer smooth quite movements. The solution The invention is based on the principle of a free standing trapped carriage sliding freely and safely in an x-y motion, inside the grove of this embodiment. The main embodiment consists of decorative trap bolts assembled to ceiling tile, and a free moving carriage which holds the patient load. Horizontal movement The carriage would be able to move in any x-y horizontal position under the ceiling tile guided by the embodiment's central structural trap bolts. The gravitational fall is prevented by having the carriage diameter sized larger than the bottom base of the trap bolts. Vertical movement Would remain the same as available in the market and this invention will accommodate existing available equipment in the market, however the lifts have to be affixed to the invented embodiment's sliding carriage. Original The type of this embodiment is non existent and obviously, having the ability to be at any horizontal x-y position has practical advantages over existing single track products. This mass produced durable product is very simple, unique and would require minimal service maintenance. The appropriate preferred practice would be in use in at hospitals, elderly institutions like nursing homes and long term retirement homes as well as homes of our beloved elderly seniors. The carriage features extends to hold IV bags movable to any where in the room, replace curtain tracks in the hospital where the privacy area could be enlarged or reduced at will because the curtain would follow the carriage wherever it was directed. It would also be associated with other products like a lift, curtain rings, slings etc. Competition This product would put competition on notice and make some of their products redundant if not obsolete. This is an opportunity with an international scope with a Canadian based design innovation. Accommodation The embodiment allows incorporating ceiling fixtures such as lamps, smoke alarms via suitable brackets and will have outlets in the ceiling tiles to allow wire runs. Manufacturing The use of injection mold technology would bring the price level to affordability. The product is profitable, simple and easy to produce. The intent is to use environmental friendly recyclable materials. Technology The embodiment could be injection molded from readily available high strength advanced polymers. Sliding surfaces could be made out of low friction materials to lower the push force. The material would have a high wear and tear chemistry element. Operations The parts can be assembled at site without any special tools. The installation would require close adjoining of tiles on all x-y and also z axis to allow free carriage movement. The Installers would be certified to tackle safe load distribution and mounting considerations. Because this product is modular, it can be easily dismantled, transported and accommodated to a new home without damage to existing ceiling. Spin-off and enhancements Due to the embodiment's ability to be positioned anywhere in the ceiling, spin-off to other industries for lift operations or ceiling use, looks very promising. This technology could be extended to other lifting requirements in industries such as factories, meat plants, public transportation, malls etc. This embodiment offers other hanging products that can be attached to this embodiment. Limitations Just like the existing tracks, the embodiment would be designed to hold practical patient dynamic weights and exceeding these tested limits would prove risky and hazardous. As in the ceiling lift industry, the various ceilings should also be sufficiently structurally strong for the embodiment to be firmly installed and affixed for safe operation. Additional structural reinforcement could be required in rare cases. Concerns The tile mounting holes are designed to accommodate concrete ceilings and to various American and European joist sizes. There are objects in the ceiling such as lamps, fans, sprinklers, etc that could interfere if they are not be incorporated within the embodiment. The necessity of this embodiment outweighs the objections to reroute ceiling fixtures and services. Others may object placing any thing on the ceiling. Disclosures This patent has not been disclosed to any body except trusted family members and a patent attorney.

Abstract

Brief assistive devices industry background summary

Many hospital patients and senior citizens lack mobility freedom. There are many various assistive devices which aid in the movement and transport of these physically challenged individuals. To name a few assistive devices, there are wheelchairs, walkers, scooters and walking sticks. At some point during transport movement, they require transfers from these assistive devices to a bed, bathtub, sofas, automobiles, public pools etc. Continuously lifting patients have caused many back injuries at homes and hospitals and because of this, all hospitals have initiated a zero lift policies for the practicing nurses. Manufacturers have come far by developing and selling various lifting devices which are rolled to the bed, car etc and a small actuator lifts the patients up or down. Other ways are use of ceiling lifts to avoid slippery floors or frictional surfaces such as carpets etc, in which a motorized lifting device is attached with a strap to a ceiling track. The track itself is made out of an extruded metal. Inside the track rolls a 6 wheeled carriage. The carriage also acts like a lifting pivot and provides a **single directional** movement function to transfer patients to the desired locations, but limited only to where **the tracks are laid track**.

In my invention the freedom to position and transfer patients, anywhere is greatly enhanced. This raises the mobility as well as the standard of living for a maturing population which is a growing trend. The market demographics for this product are very strong as the baby boomers are retiring.

Expanding on the existing Problem

The main purpose of the problem was overcome some disadvantages and difficulties associated with the track lift systems. The track system provided motion in the direction where the tracks are permanently installed. The lifting positions were limited to where the tracks were installed. More tracks were necessary if they were needed to reach certain areas like a bath tub, toilet etc. and if the track crossed one another then they had to have a mechanical turntable installed at the cross-over junction to allow a change in direction. More over, the track looks ugly with protruding rail in the ceiling.

Objectives

The challenge was to make the track available **in any** area of a room and **avoiding** the rotational directional change. They also had to have an appealing decorative and a pleasing look. It also had to accommodate existing motor lifts which are available in the market. The design had to be strong to carry patient weights and offer smooth quite movements.

The solution

The invention is based on the principle of a free standing **trapped** carriage sliding freely and safely in an x-y motion, inside the groove of this embodiment. The main embodiment consists of decorative trap bolts assembled to ceiling tile, and a free moving carriage which holds the patient load.

Horizontal movement

The carriage would be able to move in any x-y horizontal position under the ceiling tile guided by the embodiment's central structural trap bolts. The gravitational fall is prevented by having the carriage diameter sized larger than the bottom base of the trap bolts.

Vertical movement

Would remain the same as available in the market and this invention will accommodate existing available equipment in the market, however the lifts have to be affixed to the invented embodiment's sliding carriage.

Original

The type of this embodiment is non-existent and obviously, having the ability to be at any horizontal x-y position has practical advantages over existing single track products. This mass-produced durable product is very simple, unique and would require minimal service maintenance. The appropriate preferred practice would be in use in hospitals, elderly institutions like nursing homes and long-term retirement homes as well as homes of our beloved elderly seniors. The carriage features extend to hold IV bags movable to any where in the room, replace curtain tracks in the hospital where the privacy area could be enlarged or reduced at will because the curtain would follow the carriage wherever it was directed. It would also be associated with other products like a lift, curtain rings, slings etc.

Competition

This product would put competition on notice and make some of their products redundant if not obsolete. This is an opportunity with an international scope with a Canadian-based design innovation.

Accommodation

The embodiment allows incorporating ceiling fixtures such as lamps, smoke alarms via suitable brackets and will have outlets in the ceiling tiles to allow wire runs.

Manufacturing

The use of injection mold technology would bring the price level to affordability. The product is profitable, simple and easy to produce. The intent is to use environmental friendly recyclable materials.

Technology

The embodiment could be injection molded from readily available high strength advanced polymers. Sliding surfaces could be made out of low friction materials to lower the push force. The material would have a high wear and tear chemistry element.

Operations

The parts can be assembled at site without any special tools. The installation would require close adjoining of tiles on all x-y and also z axis to allow free carriage movement. The installers would be certified to tackle safe load distribution and mounting considerations. Because this product is modular, it can be easily dismantled, transported and accommodated to a new home without damage to existing ceiling.

Spin-off and enhancements

Due to the embodiment's ability to be positioned anywhere in the ceiling, spin-off to other industries for lift operations or ceiling use, looks very promising. This technology could be extended to other lifting requirements in industries such as factories, meat plants, public transportation, malls etc. This embodiment offers other hanging products that can be attached to this embodiment.

Limitations

Just like the existing tracks, the embodiment would be designed to hold practical patient dynamic weights and exceeding these tested limits would prove risky and hazardous. As in the ceiling lift industry, the various ceilings should also be sufficiently structurally strong for the embodiment to be firmly installed and affixed for safe operation. Additional structural reinforcement could be required in rare cases.

Concerns

The tile mounting holes are designed to accommodate concrete ceilings and to various American and European joist sizes. There are objects in the ceiling such as lamps, fans, sprinklers, etc that could interfere if they are not be incorporated within the embodiment. The necessity of this embodiment outweighs the objections to reroute ceiling fixtures and services. Others may object placing any thing on the ceiling.

Disclosures

This patent has not been disclosed to any body except trusted family members and a patent attorney.

Specification

The invention resembles a decorative thick tile, mounted on a normal ceiling.

Full description

Sizes viewed represent concept and may vary.

Figure 1

Shows tile arrangements as seen up to a room ceiling. The tile spans across wooden joist in a ceiling. The tiles are modular and can be adjoined and arranged as required.

Figure 2 is a section of the line A-A of figure 1 showing the section across part 1 the tile and the trap bolts part 2. You can also see the carriage part 3 which is sitting on the bottom circular base between the two trap bolts. The carriage can slide freely horizontally in an x-y direction along the opening between the two trap bolts, without falling down. A ceiling bracket is shown for attaching ceiling lamp, smoke detector etc.

Figure 3 is a section of the line B-B of figure 2 showing the cutout of Part 2. The carriage diameter is designed to clear the center posts during movement and at the same time is prevented from dropping in between the circular carriage base.

Figure 4 is a four carriage system with a central hook to attach load. The load weight is distributed along a wider trap bolts support area.

Figure 5 is a one type of gearing section of a motorized system. The design provides linear as well as circular motion.

Figure 6 shows all the possible options of different attachments, anchors and element combinations available for use with this embodiment.

For all drawings:-

Part 1

The Ceiling Tile is a typical modular tile for ceiling attachment.

Part 2

The trap bolts which are assembled to part 1

Part 3

The Load Carriages. Shown for illustration purpose but depending on the application and load requirements, multiple carriages arranged in groups can be used. An option to add thrust bearings and built in roller balls is available. A motorized carriage as an option is also available.

Part 4 (optional)

Is a typical tile bracket to hold ceiling components like lamps etc. Extension from this design is available to hold flower pot etc. Fixed or movable anchors may be used with grab bars etc.

Part 5

A hook to secure loads via straps etc

Part 6

Carriage stoppers.

Material Specifications

Part 1

The ceiling tile can be made out of high strength materials such as Delrin a registered trade mark of Dow Chemicals. Even a stronger material such as Carbon fiber is available as an alternative for heavy load applications. Reinforced materials such as small steel bars are also an option available.

Part 2

The trap bolts can be machined out of stainless steel or again Delrin or carbon fiber. The shear strength on a typical 8mm or 10mm bolt exceeds the requirement for this application.

Part 3

Carriage can be made out of steel or the above polymers as described. Multiple carriages would be used to distribute the load hence requiring smaller cross sections of trap bolts and carriages.

Preliminary finite element analyses on solid works simulation program indicates that a 250mm by 750 mm tile 35mm thick ceiling tile made out of nylon is sufficient for safe operation provided it is properly affixed to the wood joist in the ceiling.

Friction material options

Delrin itself has a low friction coefficient. Additional low friction washers such as Teflon are available in the market. These washers could be inserted in the trap bolt before securing to the tile. Low friction powder coating is available in the industry.

Claims

The embodiments of the invention in which an exclusive property or privileged is claimed are defined as follows:-

"Ceiling mobility and mounting system"

Embodiment Comprising: of

1. **The ceiling tile (1)**
Unique sized base plate with slots to affix to various ceilings. With fastening facilities to attach trap bolts (2). They are designed to be arranged and secured in a tiled fashion.
2. **The Trap Bolts (2)**
Decorative bolts positioned at regular intervals capable of carrying both dynamic and static loads. The trap bolts are fastened to the ceiling tile (1). The bolts incorporate low coefficient materials.
3. **Carriages (3)**
Rolling and sliding objects, capable of holding light and heavy dynamic and static loads for manual or motorized operation. They are oversized to prevent falling between the trap bolts (2). They can be used single for light loads and in multiple arrangements to distribute heavy loads. Optional built in roller ball or thrust bearing can be used for other applications.
4. **Any Attachments to this embodiment**
Optional associated hardware attachments within this embodiment fixed or movable providing mounting or sliding options to hang various load apparatus like curtain rollers, IV bags, lamp, smoke detector brackets etc or any associated hardware developed to or for this embodiment. The patentee claims exclusive rights to objects within this embodiment. Elements include rods, hooks, plates etc or whatever items that are attached to the embodiment.
5. **Any Supports for this embodiment.**
High strength support plates or beams
Reinforcement beam or plate devices to level the assembled tiles and or spreads the load evenly. It is adapted to be installed in various ceiling settings. The said long beam/plate device with its fastening features, provide a mating between said tile embodiments and further securable to a structural ceiling member. Fastening provision provided for electrical cable attachments thereof receiving electrical cables.

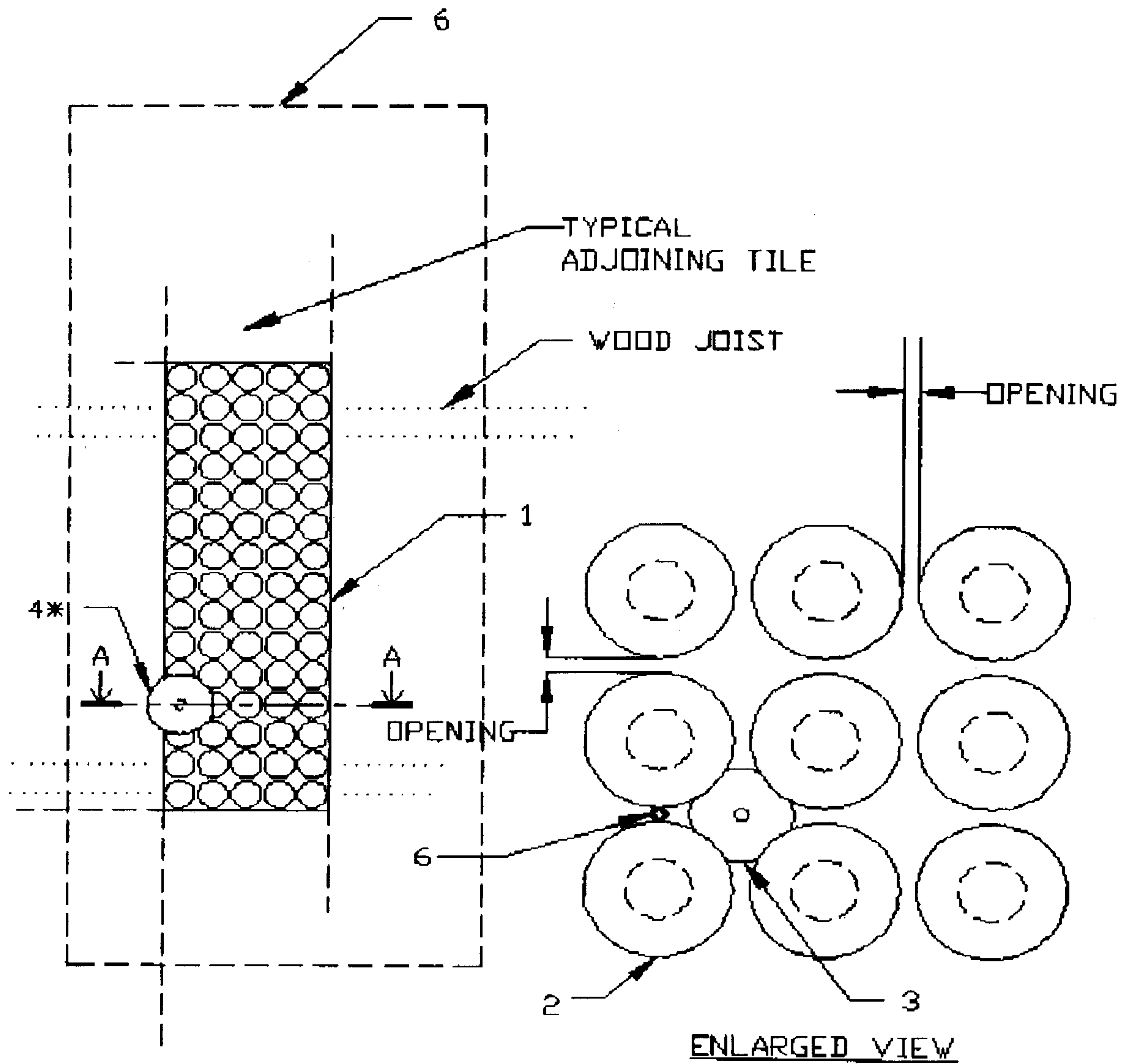


FIG. 01
BOTTOM VIEW OF THE CEILING TILE (1)
(SINGLE CARRIEGE (3) SHOWN)
(*) = OPTIONAL ITEMS

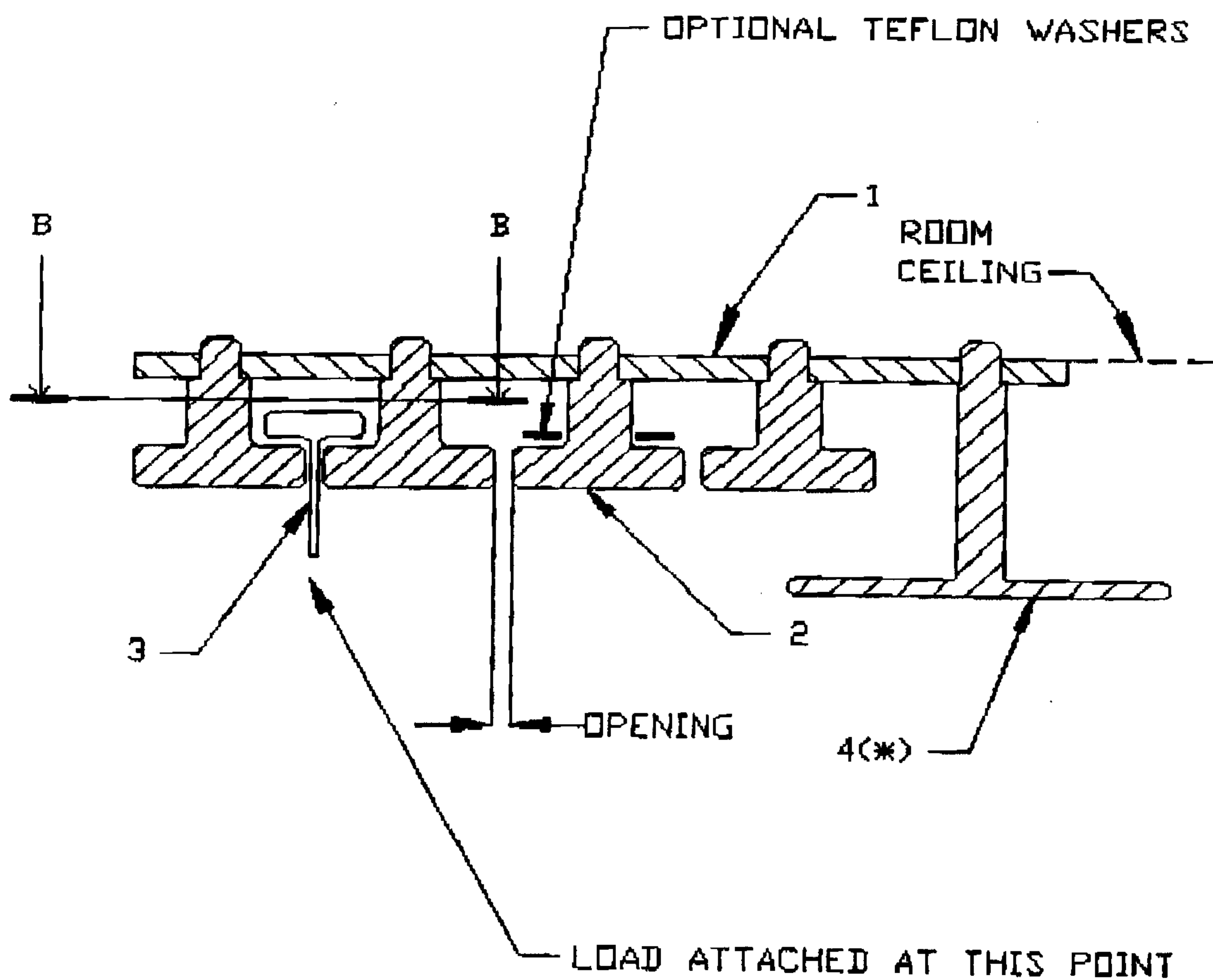


FIG. 02 SECTION A-A OF FIG. 1
(*) = OPTIONAL ITEMS

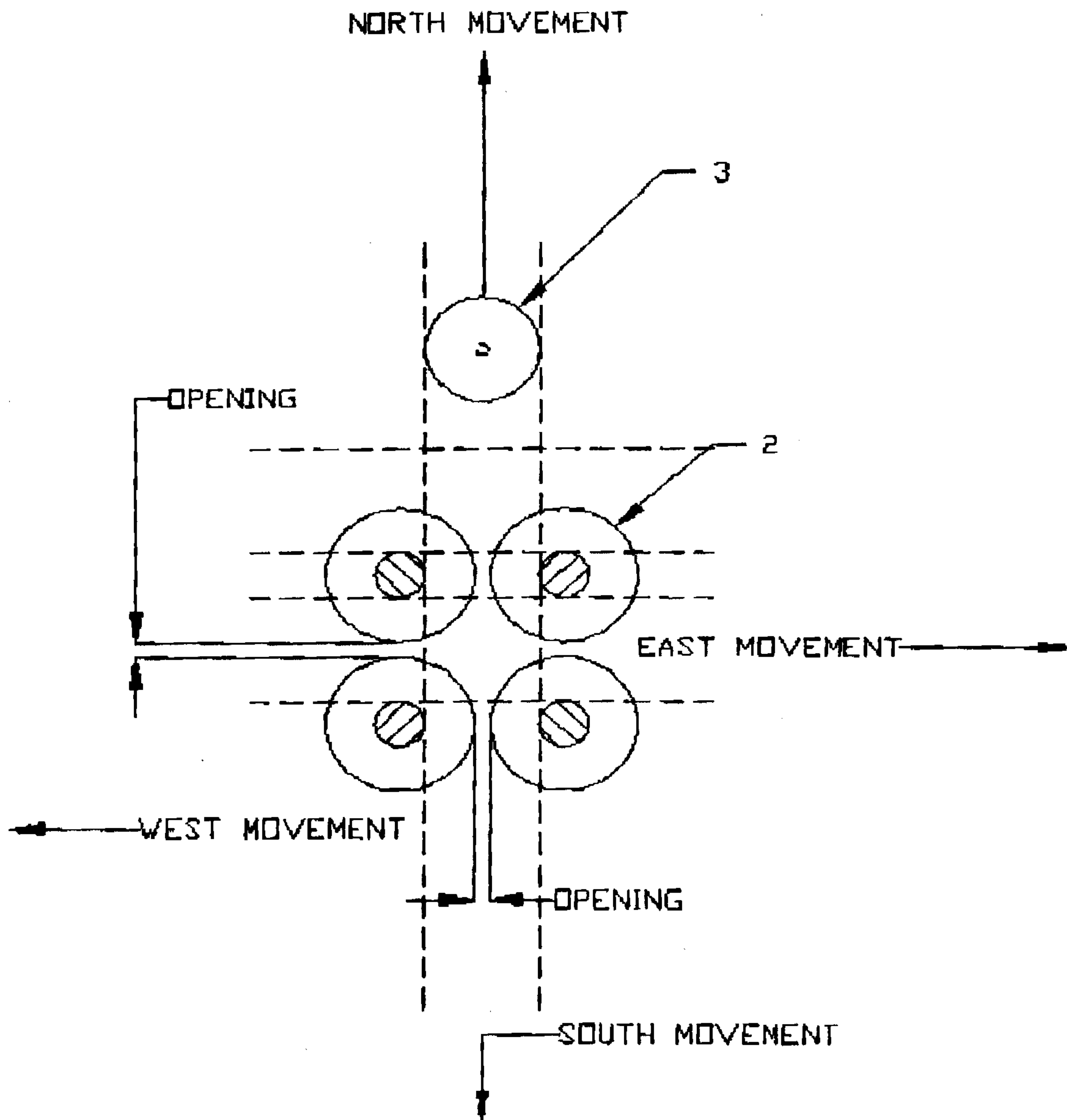
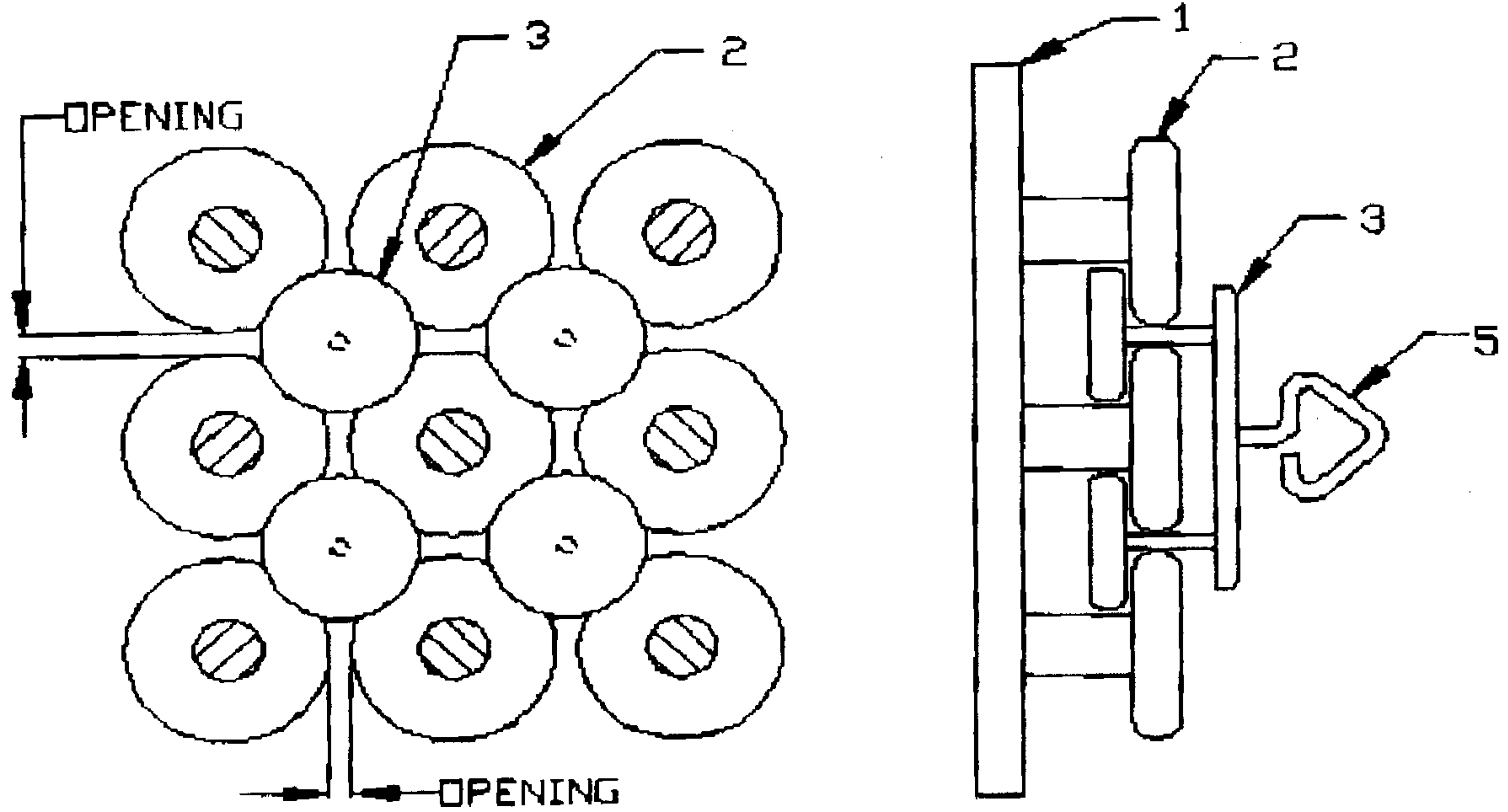


FIG 03 SECTION B-B OF FIG 2
SINGLE CARRIEGE SHOWN



SECTIONAL VIEW

SIDE VIEW

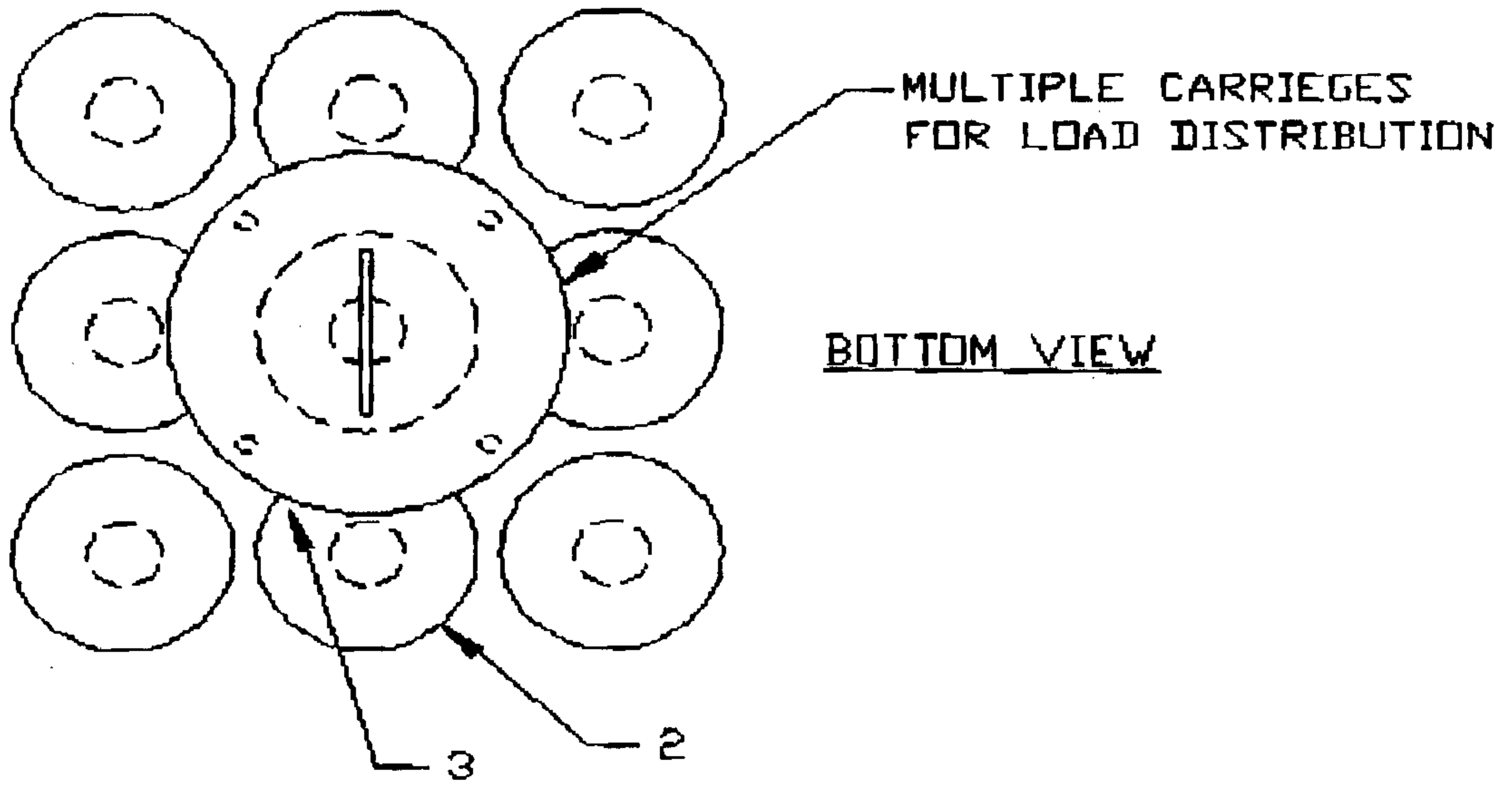
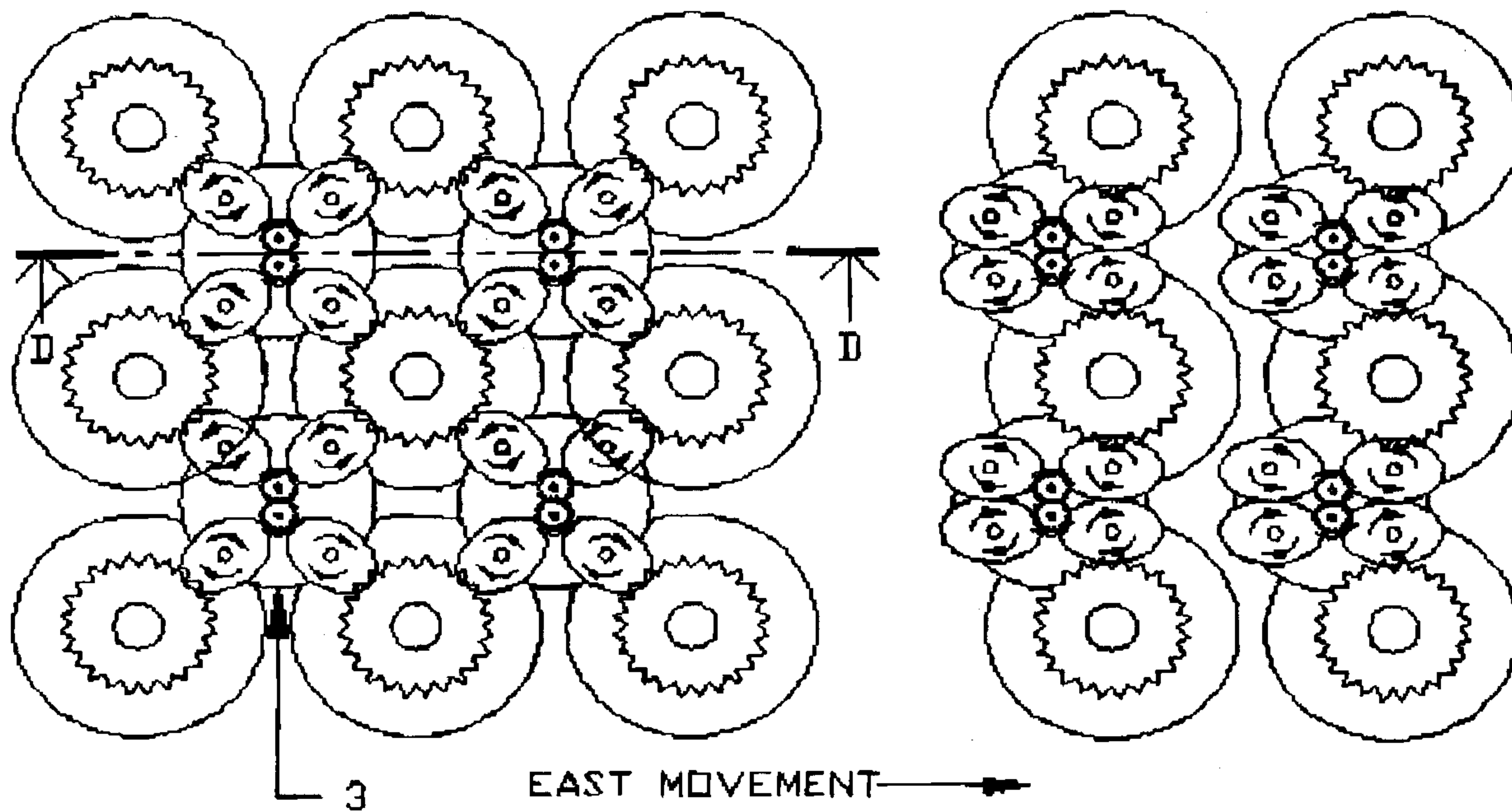
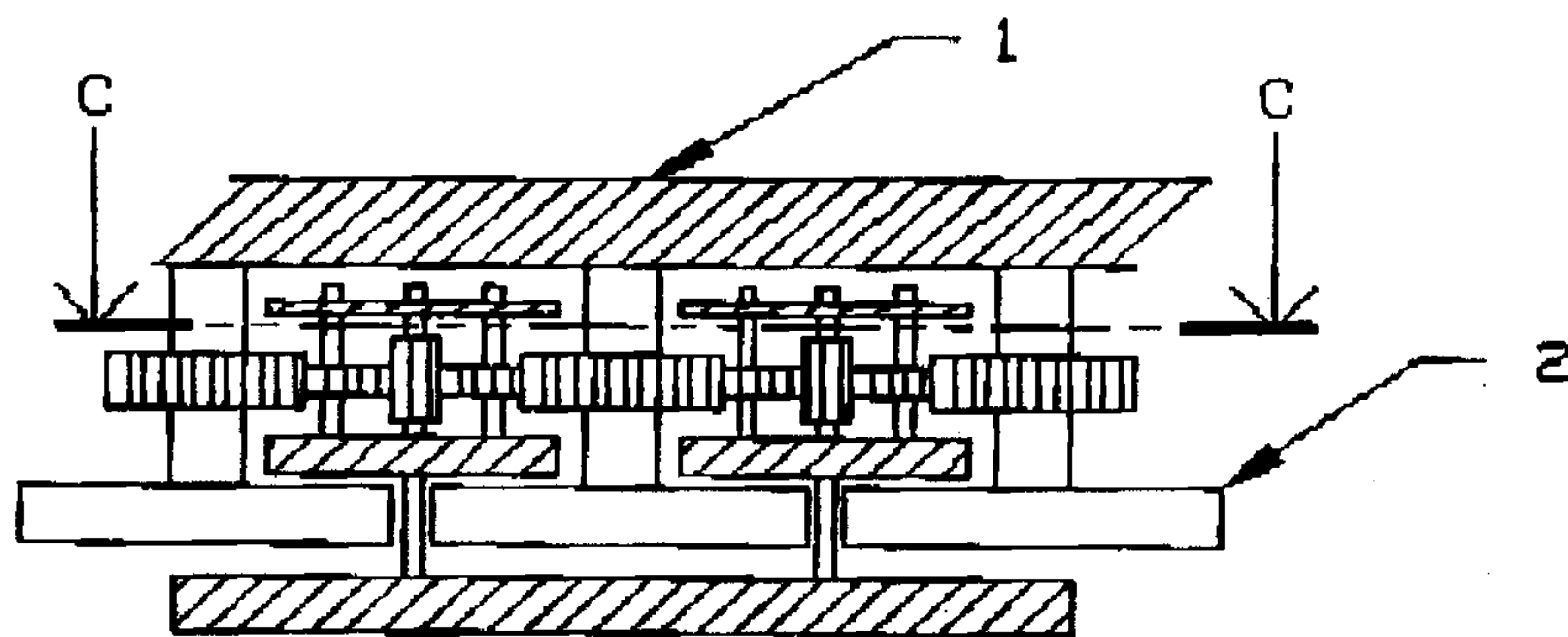


FIG. 04 FOUR CARRIEGE (3) SYSTEM



SECTION C-C OF FIG 05



SECTION D-D OF FIG 5

FIG. 05 MOTORISED CARRIEGE SYSTEM
GEARING CONCEPT
SHOWING MOTION TOWARDS EAST

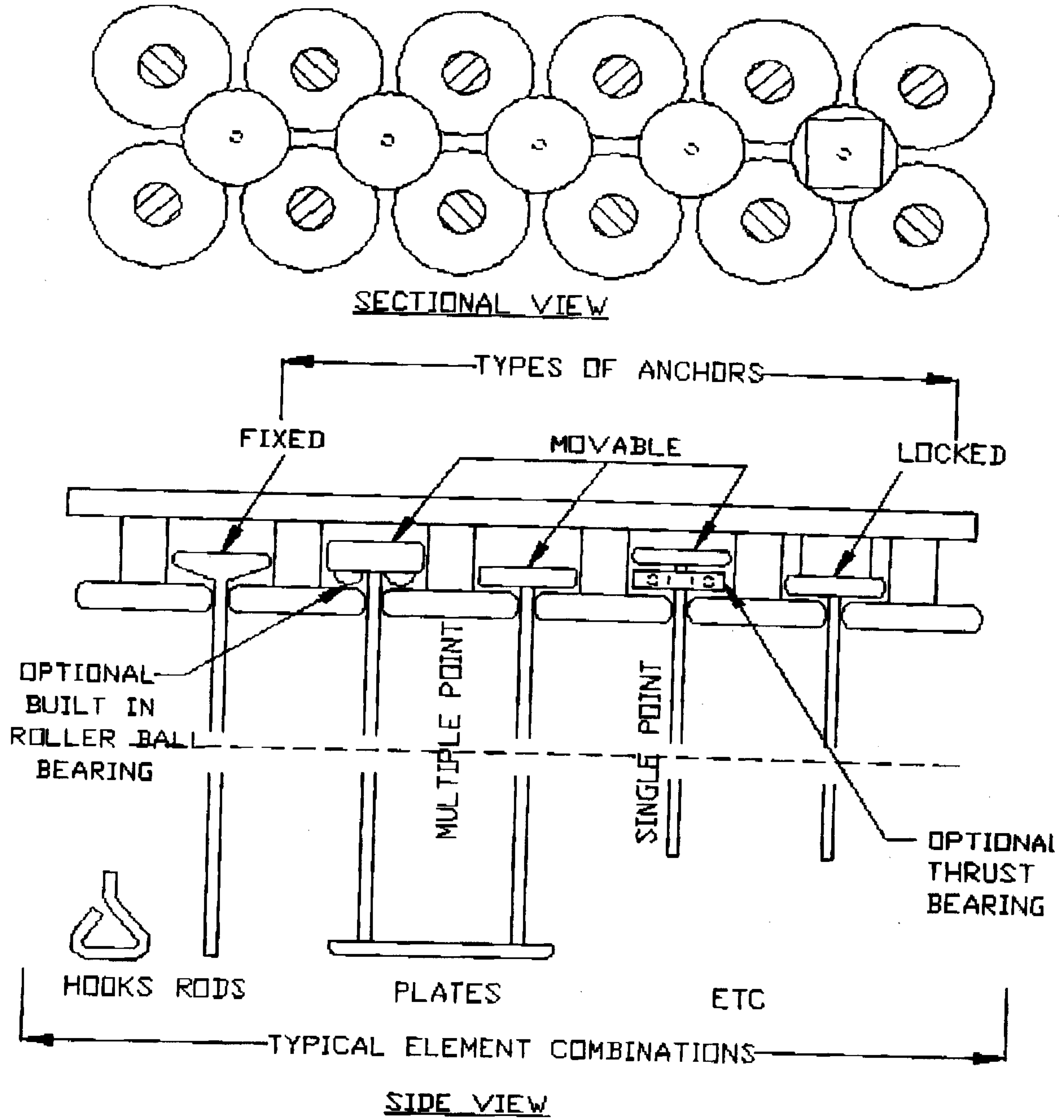
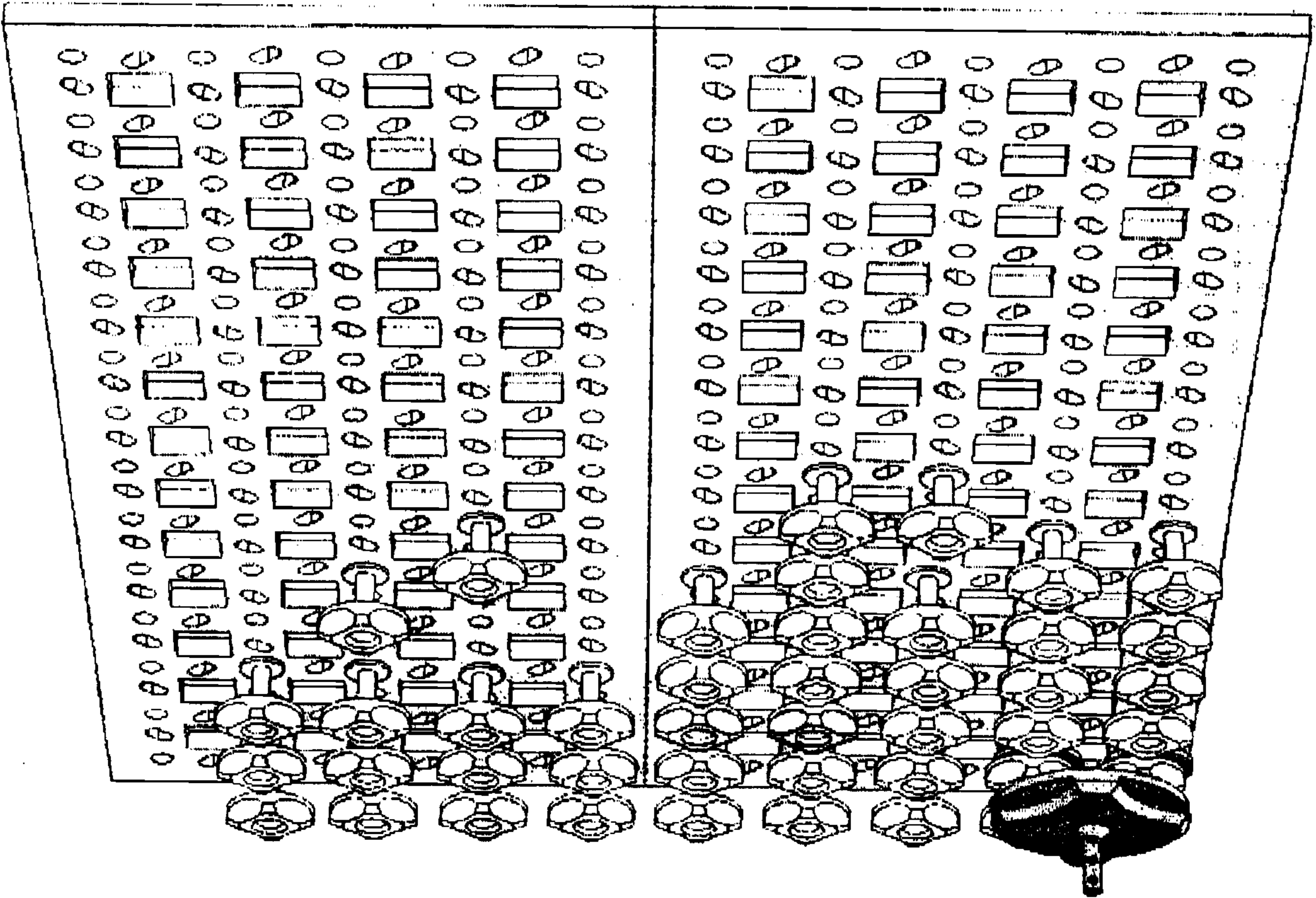
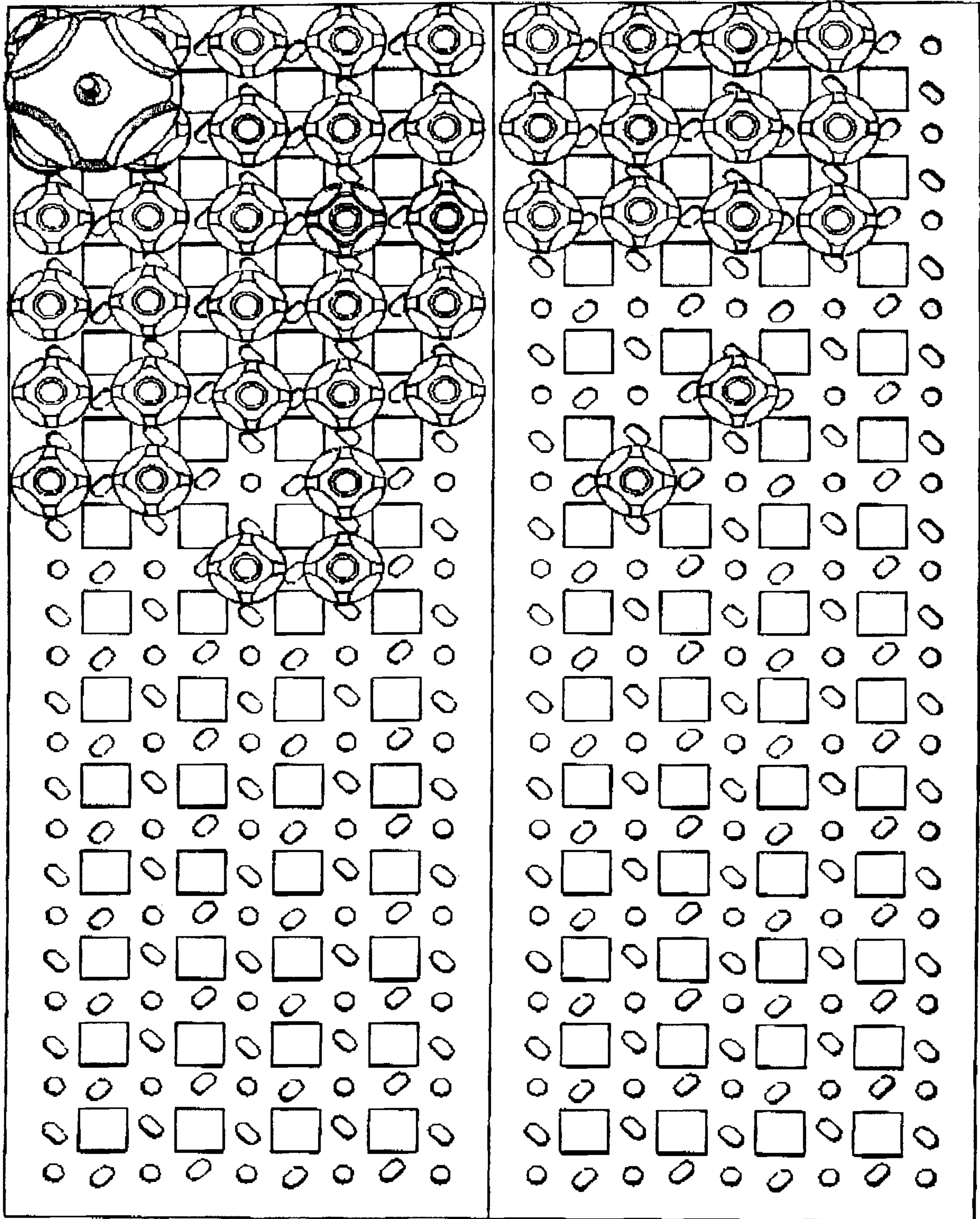
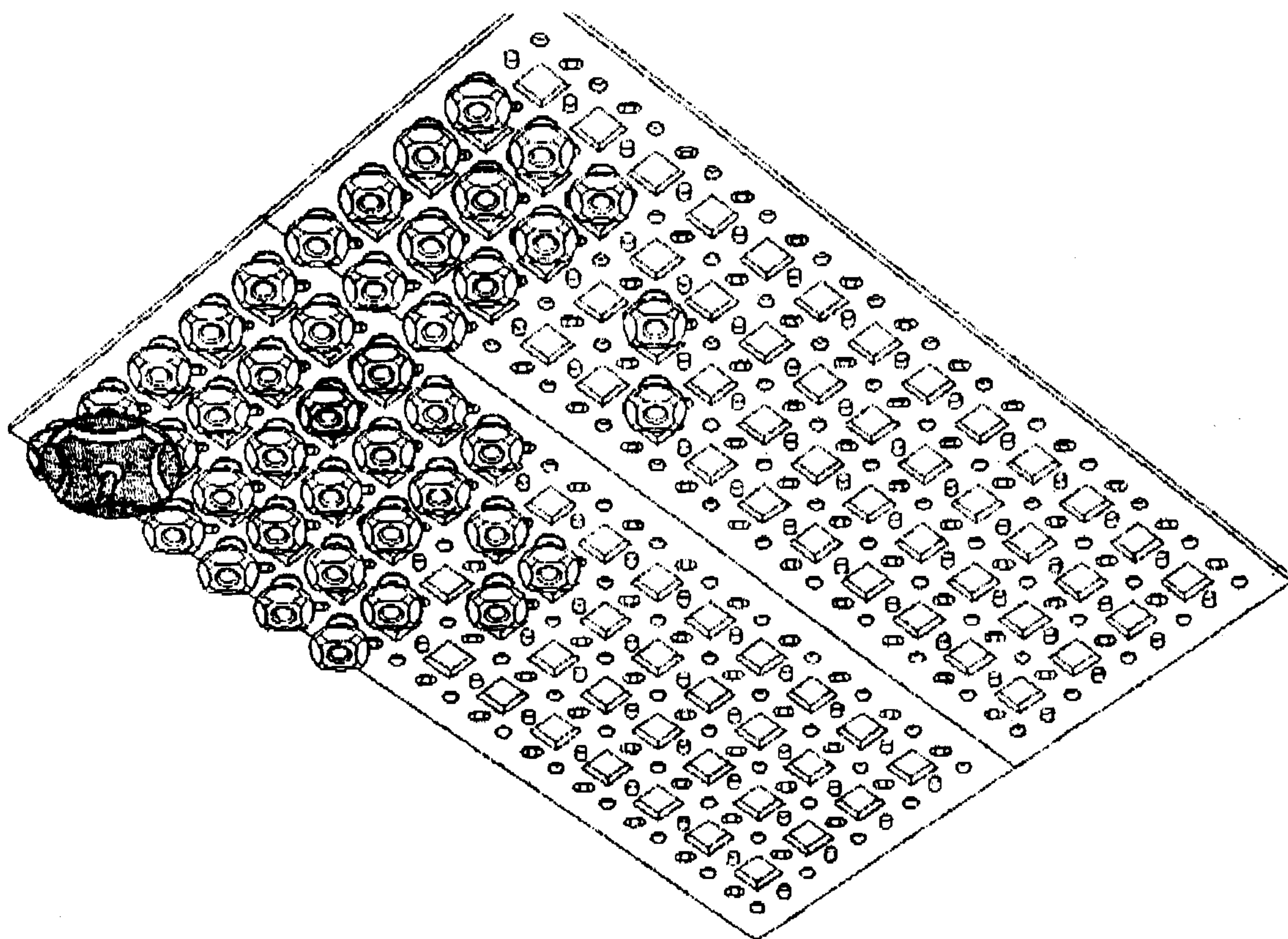


FIG. 06 OPTIONAL ATTACHMENTS

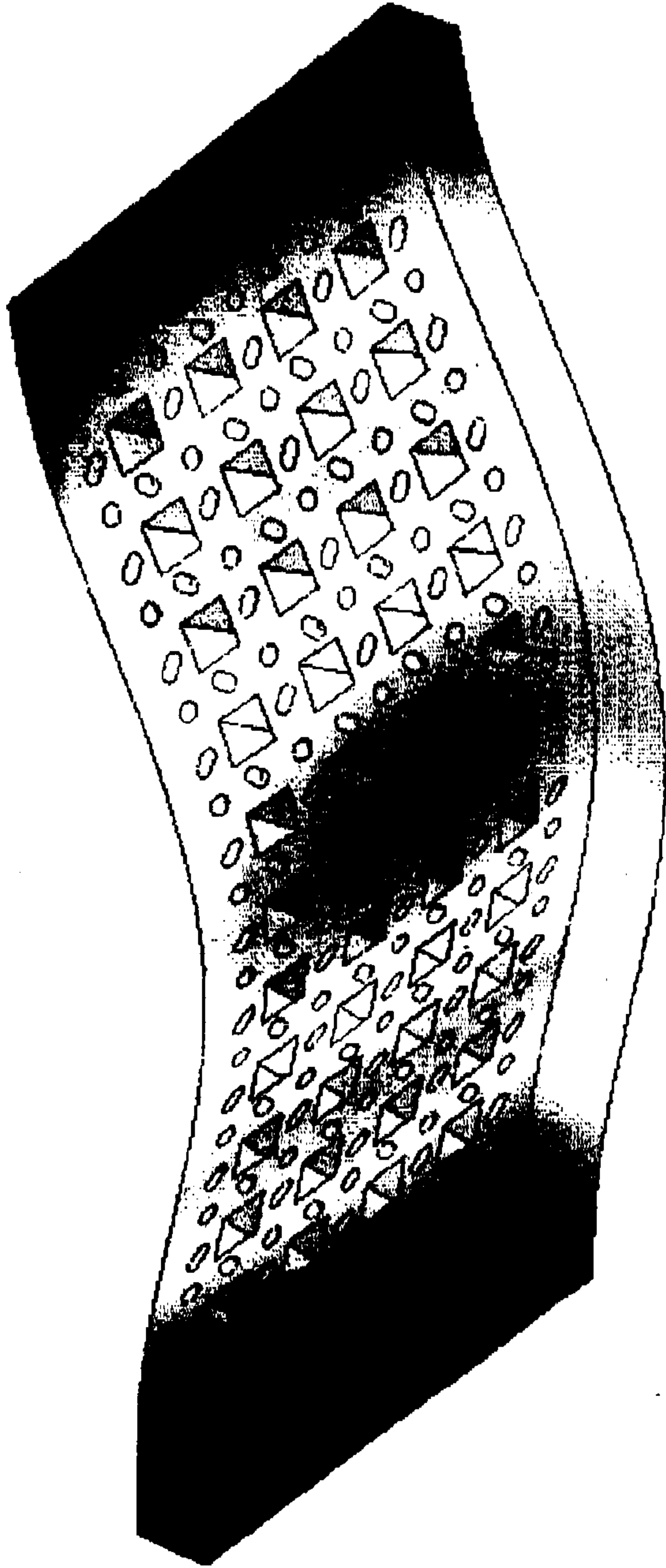






Safety factor 1.28
material

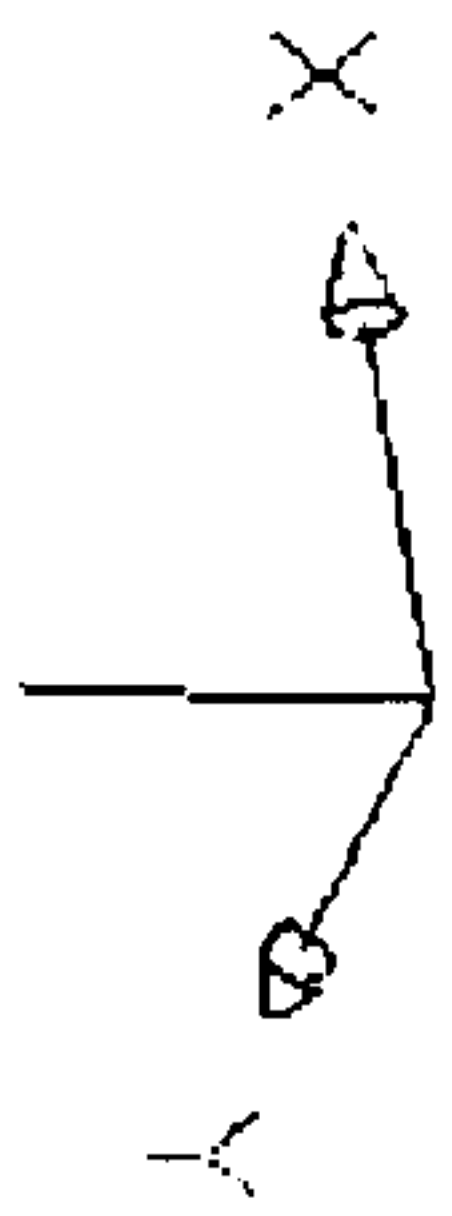
Nylon 6/10
Tensile 58 MPa (24K PSI)
Flexural Modulus 1.1 GPa
Hardness RR100



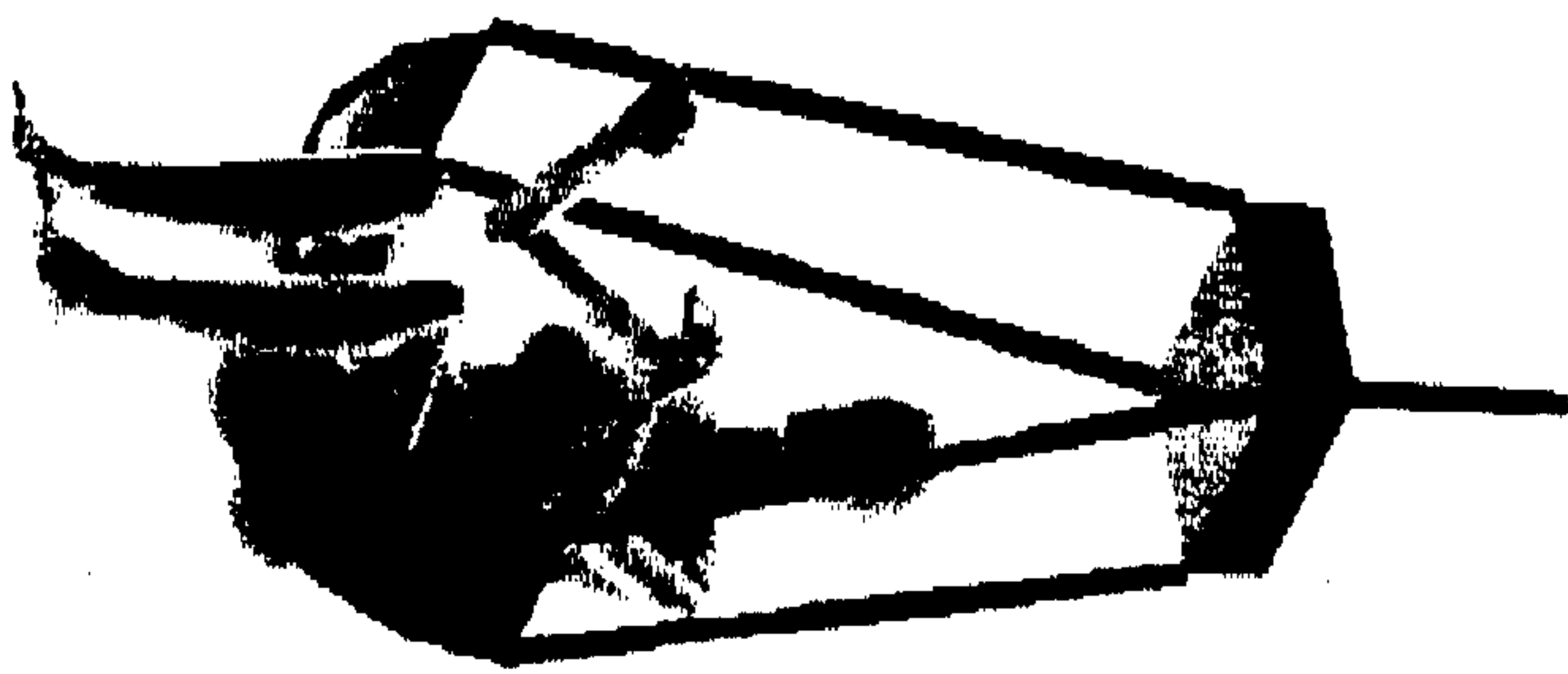
URES (mm)

- 2.271e+000
- 2.082e+000
- 1.892e+000
- 1.703e+000
- 1.514e+000
- 1.325e+000
- 1.135e+000
- 9.462e-001
- 7.569e-001
- 5.677e-001
- 3.785e-001

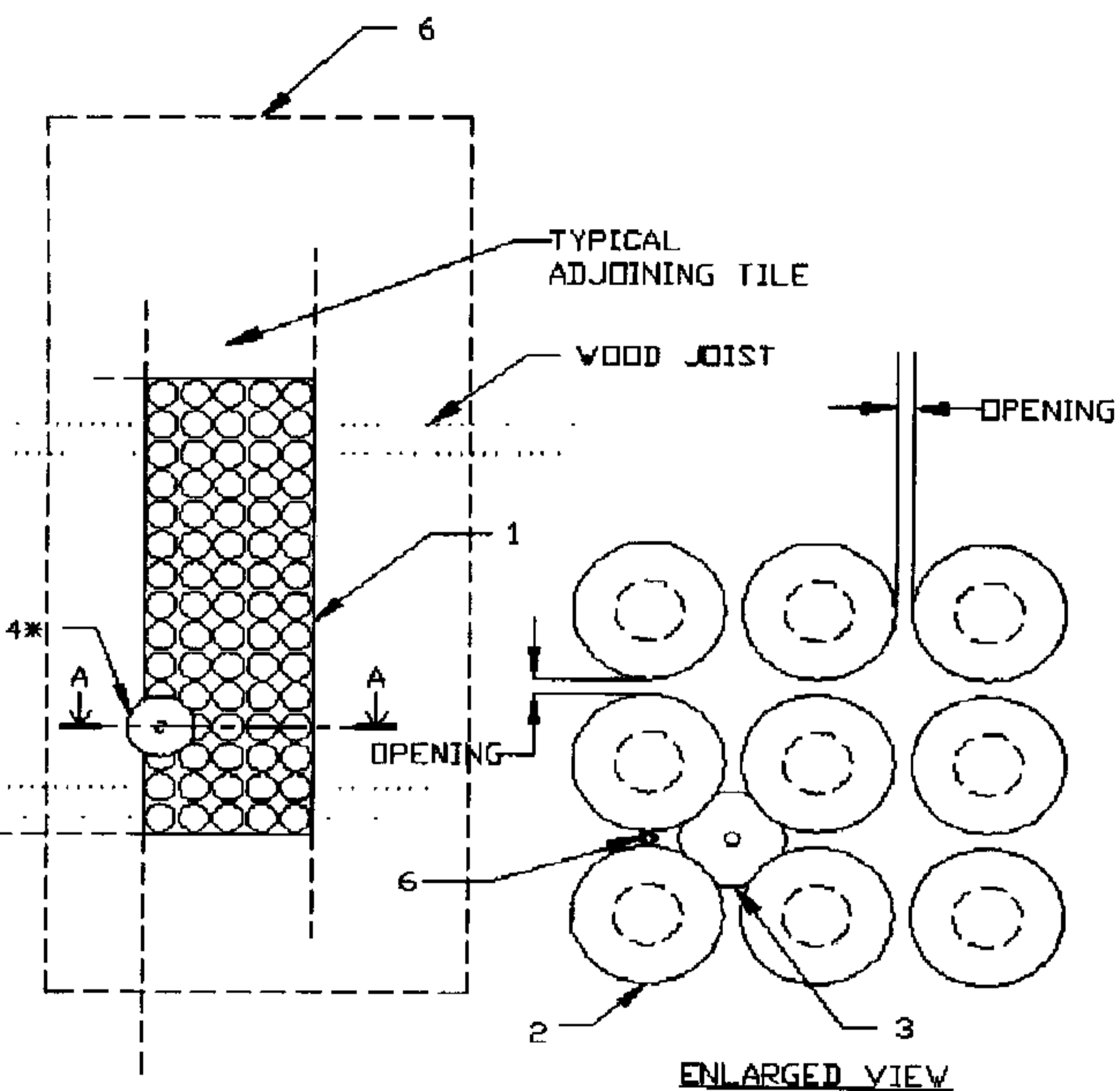
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 (SINGLE CARRIAGE (3) SHOWN)
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