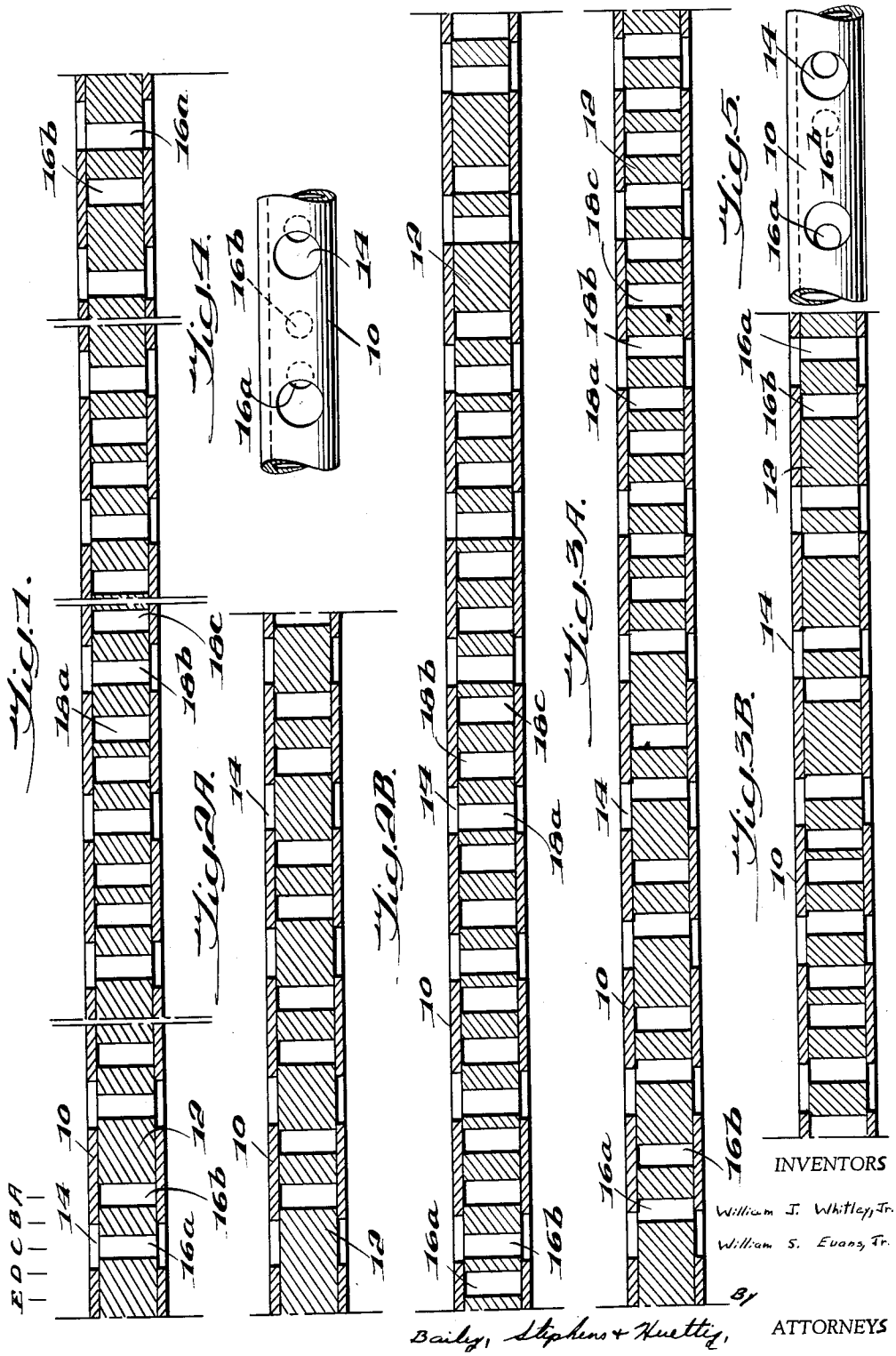
May 1, 1962 W. J. WHITLEY, JR., ET AL 3,032,239

DISPENSING MECHANISM

Filed Aug. 19, 1959 3 Sheets-Sheet 1



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DISPENSING MECHANISM

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Fig. 6.

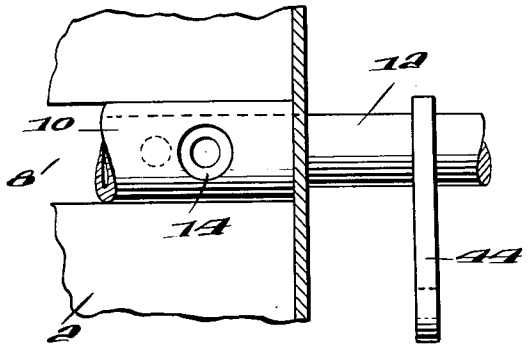


Fig. 7.

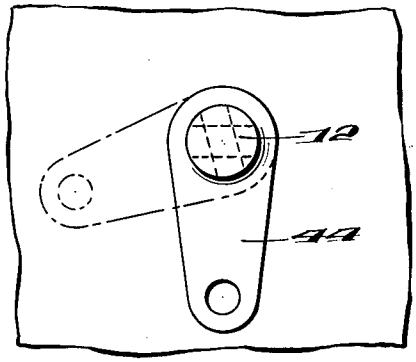


Fig. 8.

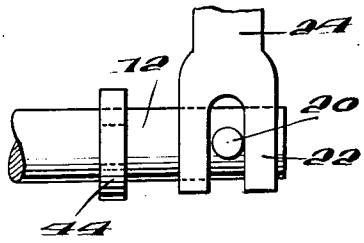


Fig. 12.

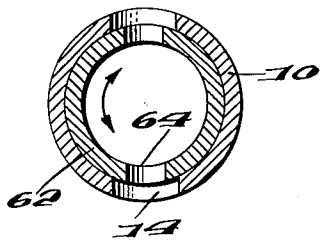


Fig. 13.

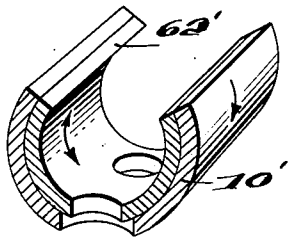
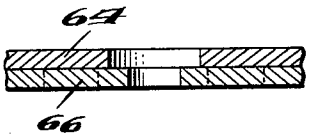


Fig. 14.



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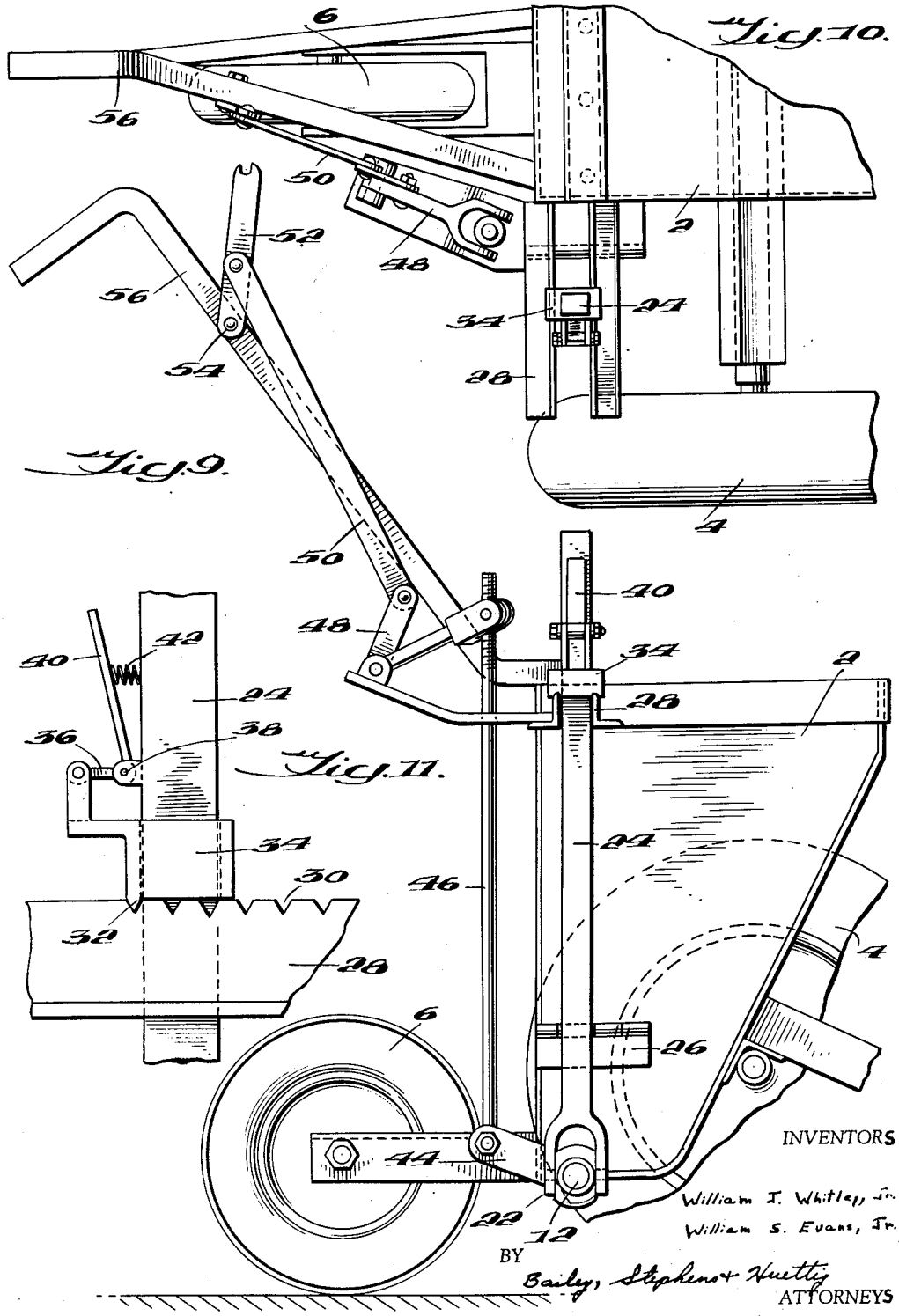
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DISPENSING MECHANISM

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3,032,239

DISPENSING MECHANISM

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Filed Aug. 19, 1959, Ser. No. 834,732
12 Claims. (Cl. 222—486)

The invention relates to dispensing mechanism and more particularly to a device for controlling the flow of a liquid through an outlet. While of general utility, it is particularly adapted to a valve for use in spreading molten bitumens on a roof or other surface, a layer of felt being then applied on the top of the asphalt.

In the laying of built-up roofing, it is usual to move a tank or container mounted on wheels along the roof and to pour hot bitumen from this tank, following the asphalt with a strip of felt from a reel carried by the tank. On a sloping roof, it is desirable to apply a larger amount of asphalt at the upper edge of the strip, since some of the asphalt applied will flow down the surface even in the short time before the felt is applied. Also, in so-called "strip mopping," it is the practise to apply asphalt over only a portion of the width of the felt.

The method of controlling the application of the bitumens in the past has usually been through valves in the nature of long stemmed needle valves, the valve seats being placed in the bottom of the tank or compartment holding the bitumen with valve adjustment means to regulate the opening distance between the valve seat and the valve stem located at the top of the tank and consisting of nuts or thumb screws on the valve stems. The opening or lifting of these valves has been by lifting levers and the closing or lowering by return position spring action.

Adjusting or opening and closing of the valves is necessary for the reasons stated above. The adjusting of these valves, usually ten in number, is a painstaking and laborious job requiring time and skill. Very often a different setting is required on each valve of this type to regulate the flow of bitumen for an even spread.

The adjusting of so many valves to meet each condition results in the loss of time in trial and error, plus the fact that all type needle or globe valves when raised a very minute distance off the seat will give a large opening in area when this opening distance is multiplied by the perimeter of the valve seat. Consequently, when small amounts of bitumen are needed, the distance between the valve contact point and the valve seat is exceedingly small. When using heavy viscous bitumens such as asphalt, the opening through which the bitumen must flow is too small to allow the fine solids mixed in the bitumen to pass. Usually the valve is opened more than is required to allow the material to pass, thus causing excessive waste of materials in addition to time lost in valve adjustments.

The adjustment of the valves is a particularly serious difficulty when working on an inclined roof, where the operator ordinarily goes back and forth across the roof, since they must be readjusted individually at each end of the run to obtain greater flow at the upper edge than at the lower edge.

The primary object of the present invention is to provide an arrangement which overcomes the drawbacks of the prior art devices.

Another object of the invention is to provide a single dispensing valve mechanism which can be shifted quickly between various positions, in which it can either open all the holes along its length completely, or open the holes to a varying degree from one end to the other in either direction, or close off a group of holes at one end while leaving the balance of the holes fully open.

A further object of the invention is to provide a mechanism in which all the holes can be quickly and simultaneously opened and closed, without disturbing the setting of the openings.

It is also an object of the invention to provide a mechanism of this type which is not as likely to clog up as the needle valve or globe valve structures of the prior art.

In general, the invention includes a mechanism located in an elongated opening and including two members which are movable relative to each other in the direction of the longitudinal axis of the opening. One of the members has a plurality of holes therein substantially in a straight line parallel to such axis, and preferably equally spaced apart. These holes form two end groups and a central group. The other member has two holes corresponding to each hole of an end group and three holes corresponding to each hole of the central group. The spacing of the groups of holes in the second member is preferably slightly different from the spacing of the holes in the first member.

The members may also be movable relative to one another in a direction transverse to the axis of the opening, such movement closing all of the holes to prevent discharge of liquid from the container.

While the relatively movable members may take different forms, we prefer for reasons of economy to use pipes fitting one within the other, turnable and slidable with respect to each other. The term "transverse movement" as used herein is intended to include such turning movement.

Further objects and advantages of the invention will appear more fully from the following description especially when taken in conjunction with the accompanying drawings, which form a part thereof.

In the drawings:

FIG. 1 shows in cross-section a valve mechanism embodying the invention;

FIGS. 2A and 2B show the two halves of such a valve mechanism in a different position;

FIGS. 3A and 3B show the two halves in still another position;

FIGS. 4 and 5 are plan views of a part of the mechanism;

FIG. 6 shows the mounting of the valve in the container;

FIG. 7 is an end view thereof;

FIG. 8 shows a detail of the operating means for the valve;

FIG. 9 shows a part of a container in plan view with the operating mechanism for the valve;

FIG. 10 is a side elevation thereof;

FIG. 11 is a detail of the lever holding means;

FIGS. 12 to 14 show parts of modified forms of valves.

The invention is shown herein in connection with a machine for spreading bitumen, used in connection with the laying of felt. This machine includes a tank **2** for holding the hot bitumen, which is mounted on wheels **4, 6**. At its lower end the tank has an elongated opening **8** (FIG. 6) in which may be welded or otherwise secured a pipe **10**. A rod **12** is slidably and turnably mounted within the pipe **10**.

As shown particularly in FIGS. 1 to 3, the pipe **10** is provided at its upper and lower sides with a series of holes **14**. These holes are equally spaced along the length of the pipe, and their centers are arranged in a straight line parallel to the longitudinal axis of the elongated opening **8** in the bottom of the tank. Preferably, in the form shown herein, there are 15 of such openings spaced, for example, 2⅜ inches from center to center. These openings may be considered as divided into two end groups of five openings each and a central group of five openings.

The rod **12** is provided with a set of two openings **16***a*, and **16***b* corresponding to each opening of each end group, and with a set of three openings **18***a*, **18***b* and **18***c* corresponding to each opening of the central group.

The space between these sets of openings, for instance the space between each opening **16***a* and the next opening **16***a* and between the opening **16***a* nearest the center group and the opening **18***a* of the nearest set of openings of the center group is preferably slightly different, for example slightly less than the spacing of the holes **14**. For instance, it may in the example shown amount to $2\frac{23}{64}$ inches.

The openings are so spaced that, as shown in the drawings, there are five possible positions. These positions are represented by the center line of the left hand opening **16***a* accupying any one of the positions A, B, C, D, E in FIG. 1.

In position C, as will be plain from FIG. 1, all of the openings **14** are in full communication with openings **16***a* and **18***b* (opening **16***a* being the opening remote from the center group of each pair of openings in the end groups, and opening **18***b* being the central opening of the set of three corresponding to each hole of the central group). In the position A, represented in FIGS. 2A and 2B, the rod is slid to the right to such a degree that openings **16***a* and **16***b* of each left hand end group are closed, while the central group of holes is fully open through openings **18***a* and the right hand group of holes is fully open through openings **16***b*. Finally, in FIGS. 3A and 3B, representing position B, the holes are progressively closed from the right hand end to the left hand end. The right hand hole **14** is fully open through openings **16***a*, the central group of holes **14** are partially open through holes **18***b*, and the holes **14** of the left hand group are only slightly open through openings **16***a*.

Positions D and E correspond to positions B and A respectively but with the rod shifted equally to the left. In position D the holes will be progressively closed from left to right, and in position E the left hand end and central groups will be open while the right hand group will be closed.

It will be clear likewise that, when the rod is turned through approximately 60 degrees, whatever be its longitudinal position, all of the openings through the rod will be closed so that flow will be shut off entirely (see FIG. 8).

The rod is turned and moved longitudinally by the mechanism shown in FIGS. 8 to 11. In these, the rod **12** is shown as having a pin **20**, engaged by a fork **22** of a lever **24** which is fulcrumed in a bracket **26** mounted on the side of the tank **2**. On its upper side, the lever **24** is guided between angle irons **28** extending laterally from the side wall of the tank. These angle irons have in their upper edges notches **30** in which engage a downward projection **32** of one wall of a rectangular member **34** which is slidable on the handle **24**. This is connected to one arm **36** of a lever pivoted at **38** on the handle, the other end **40** of the lever being pushed away from the handle by spring **42**. Thus by pulling the rod toward the lever the locking member **34** will be raised so that the rod can be positioned to any of five positions and will shift the rod **12** between the various positions A to D.

For opening and closing the valve, the rod is provided with a lever **44** which is connected by a link **46** to a bell-crank lever **48** pivoted on the frame and connected by a link **50** to control handle **52** pivoted at **54** on the main handle **56** of the machine. By moving this handle, the rod can be turned between open and closed positions. There is sufficient friction to hold the rod in either position once it has been moved as desired.

While for purposes of clarity FIGS. 1 to 3 show the use of a bar as the inner member, actually for purposes of economy it is preferred to use two pipes, an outer pipe **10** corresponding to that of FIG. 1 and an inner pipe **62** having opening **64** arranged in the same manner as the passages **16**, **18**. Pipe **62** fits closely within pipe **10** and is both rotatable and slidable in the pipe **10**.

It is likewise possible, as shown in FIG. 13, to use only partial segments of pipe such as **10'**, **62'**, or as shown in FIG. 14, to use plates **66**, **68** slidably mounted on one of the other.

With such an arrangement, it can be seen that the mere shifting of the lever **24** immediately gives any of the five desired positions, including one-third free passage all along the valve, the closing of one-third of the valve at either end or progressively increasing flow from either end of the valve to the other. Likewise, the valve openings are comparatively large and there is less likelihood of the clogging of the valve mechanism by the bitumen.

While we have described herein one embodiment of our invention, we wish it to be understood that we do not intend to limit ourselves thereby except within the scope of the claims hereto or hereinafter appended.

We claim:

1. A liquid dispensing mechanism having a container with an elongated opening therein, means for controlling the flow of liquid through said opening comprising two members movable relative to one another in the direction of the longitudinal axis of said opening, one of said members having a substantial number of holes therethrough arranged substantially in a straight line parallel to said longitudinal axis, said holes being divided into at least two groups each including several holes, a first group being located adjacent one end of the opening and a second group being spaced from such end, the second member having aperture means therein for opening the holes of the second group only upon relative movement of the members in the direction of the longitudinal axis, for opening the holes of the first and second groups by amounts varying progressively from one end of the first group to the other end of the second group in a second position, and for fully opening all of the holes of the first and second groups in a third position.

2. In mechanism as claimed in claim 1, said members being relatively movable transversely to said longitudinal axis, said second member having means for closing all of the holes of the first and second groups upon relative movement between the members in said transverse direction.

3. In mechanism as claimed in claim 1, said aperture means comprising holes in said second member including a third group including one hole corresponding to each hole of the first group and a fourth group including first and second holes corresponding to each hole of the second group, the spacing of the center of the holes of the first and second groups being slightly different from the spacing of the centers of the holes of the third group and the first holes of the fourth group, the second holes of the fourth group being located on the sides of the first holes adjacent the holes of the third group.

4. In mechanism as claimed in claim 3, said members being relatively movable transversely to said longitudinal axis, said second member having means for closing all of the holes of the first and second groups upon relative movement between the members in said transverse direction.

5. In mechanism as claimed in claim 4, said members being tubular and being concentric about said straight line and arranged one fitting within the other, said members being relatively turnable about said straight line and relatively slidable in the direction of said straight line.

6. In mechanism as claimed in claim 1, said members being tubular and being concentric about said straight line and arranged one fitting within the other, said members being relatively turnable about said straight line and relatively slidable in the direction of said straight line.

7. A liquid dispensing mechanism having a container with an elongated opening therein, means for controlling the flow of liquid through said opening comprising two members movable relative to one another in the direction

of the longitudinal axis of said opening and in a direction transverse thereto, one of said members having a substantial number of holes therethrough arranged substantially in a straight line parallel to said longitudinal axis, said holes being divided into two end groups and a central group each including several holes, the second member having aperture means therein for opening the holes of the central group only upon relative movement of the members in the direction of the members in the direction of the longitudinal axis, for opening the holes of the end groups and central groups by progressively varying amounts in a second position, and for fully opening all of the holes of the end groups and the central group in a third position.

8. In mechanism as claimed in claim 7, said second member having means for closing all the holes of the end groups and the central group upon relative movement between the members in said transverse direction.

9. In mechanism as claimed in claim 7, said aperture means in said second member including holes in said second member including second end groups each including at least two holes corresponding to each hole of each end group in the first member and a second central group including at least three holes corresponding to each hole of the central group in the first member.

10. In mechanism as claimed in claim 9, the spacing between the holes of each second end group more remote from the central group and the spacing between the more remote hole of each pair of holes of each second end group adjacent to the second central group and the central hole of the adjacent set of three holes of the second central group being slightly different from the spacing between the holes in the first member.

11. In mechanism as claimed in claim 10, said second member having means for closing all the holes of the end groups and the central group upon relative movement between the members in said transverse direction.

12. In mechanism as claimed in claim 11, said members being tubular and being concentric about said straight line and arranged one fitting within the other, said members being relatively turnable about said straight line and relatively slidable in the direction of said straight line.

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