

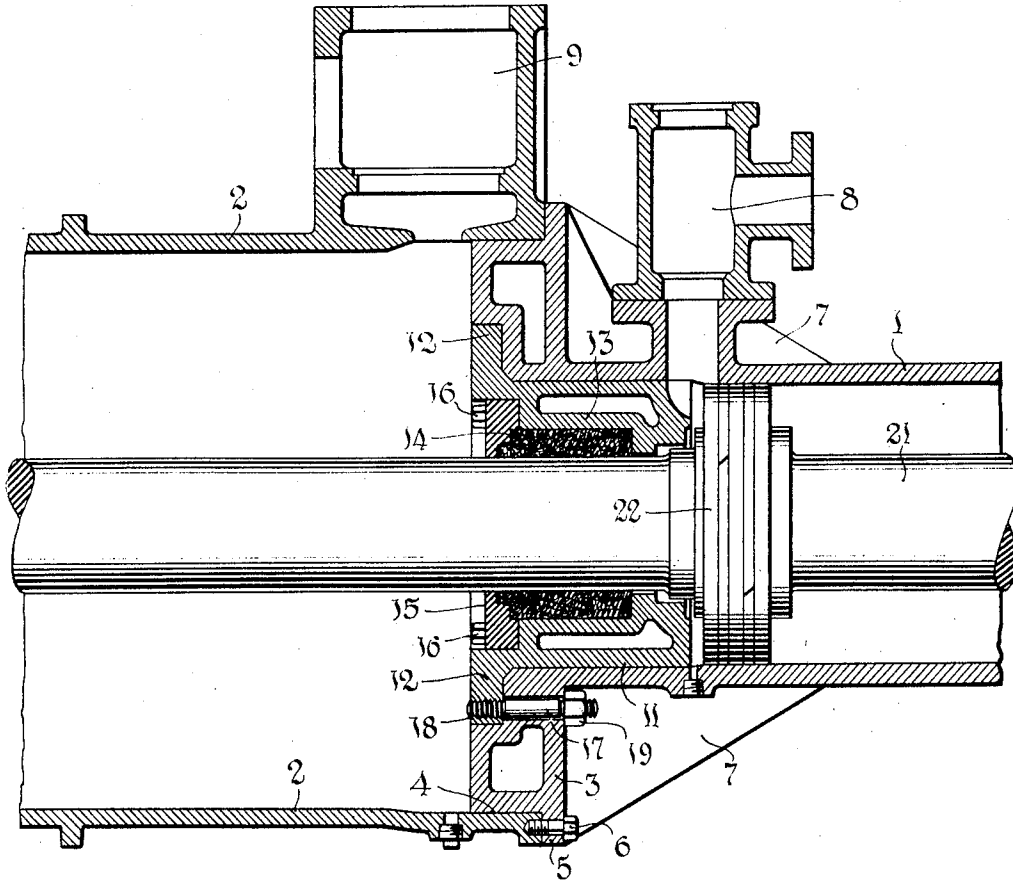
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CYLINDER HEAD CONSTRUCTION

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# UNITED STATES PATENT OFFICE

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## CYLINDER HEAD CONSTRUCTION

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5 Claims. (Cl. 121--109)

This invention relates to expansible chamber motors and particularly to an improved cylinder head and stuffing-box arrangement.

In stern wheel tow boats, such as are used on inland rivers, long stroke engines (either air or steam) are used. In some cases tandem cylinders are used and when this is the case the length of the engine becomes so great that it is desirable to close-couple the cylinders. In such event there is a single head and stuffing-box between two adjacent cylinders.

The purpose of the present invention is to improve the construction of such heads and cylinders. The invention though primarily intended for the use above suggested is applicable generally to close-coupled tandem cylinders, regardless of the fluid handled, and whether the cylinders form parts of an engine or pump and whether simple or compound. It will, however, be described by way of example as applied to a compound engine.

In the drawing parts of two close-coupled cylinders are shown in axial section with the invention applied.

A portion of the high pressure cylinder appears at 1 and a portion of the low pressure cylinder at 2. The head 3 is formed integrally with the high pressure cylinder 1, and in effect is an external annular flange thereon.

The head 3 fits into the low pressure cylinder 2 at 4 and has a flange 5, which seats against the end of the low pressure cylinder, and through which bolts 6 pass to connect the head with the cylinder 2. Webs 7 brace the head 3 to the cylinder 1.

A valve chest for the high pressure cylinder is indicated at 8 and another for the low pressure cylinder at 9. These chests are intended for the reception of poppet valves, not shown in the drawing.

The stuffing-box is constructed as a separate unit and is carried in a body 11 which fits into the head 3 in an opening which is, in effect, an extension of the bore of cylinder 1. It has an encircling flange 12 which fits into, and fills a recess formed in the head 3 to receive it.

The body 11 has the usual gland 13 to receive packing 14 (preferably metallic) and a recess partly filled by the follower 15 used to compress the packing 14. The packing is shown conventionally in the drawing. The follower 15 is held by bolts 16 whose heads lie wholly within the recess in which follower 15 is received. These bolts are, staked, pinned or otherwise locked. Experience has shown that packing can be relied upon to give continuous service over long periods.

The body 11 is held in place by studs 17 which pass through head 3. These studs are screwed into flange 12 at 18 and preferably are riveted over so they cannot work loose. The nuts 19 in the studs are external to the cylinders so that they may be inspected. This is an important point for the nuts tend to work loose. Consequently the possibility of inspecting and tightening them without dismounting any part of the engine is a matter of prime importance. While only one stud appears in the drawing, it will be understood that a plurality are used, and are in circular arrangement.

The piston rod is shown at 21 and the high pressure piston at 22.

Various modifications of detail may be made without departing from the spirit of the invention. The specific form is affected in considerable degree by the details and proportions of the engine.

What is claimed is:

1. The combination of two axially aligned cylinders of different diameters; an annular member connecting said cylinders and forming a portion of the head for the larger cylinder; a second annular member mounted within the first annular member, closing the end of the smaller cylinder and completing the head of the larger cylinder; a packing at the center of the second annular member; and connecting means for said annular members, fixed in the second thereof and extending through the first thereof to points external to both cylinders.

2. The combination of claim 1, further characterized in that the body of the second annular member approximates the internal diameter of the smaller cylinder, and has a peripheral flange which seats in a recess in the first annular member; and the connecting means comprise studs permanently fixed in said flange and extending through the first annular member.

3. The combination of two axially aligned tandem cylinders of different diameters; an annulus connecting the proximate ends of said cylinders; a combined stuffing box and cylinder head mounted in the end of the smaller cylinder within said annulus, and having a peripheral flange larger than the external diameter of the smaller cylinder; and threaded connections engaging said flange and extending through said annulus so as to be operable externally of said cylinder.

4. The combination of a high pressure cylinder having an annular external flange at one end; a larger low pressure cylinder connected with said flange; a stuffing box structure removably mounted in the end of said high pressure

<p>5 cylinder within said flange, and serving as a separating head between said cylinders; and connecting means for holding said stuffing box structure in place, said means extending through said flange and being accessible externally of said cylinders.</p>	<p>mounted in the end of said high pressure cylinder and serving as a separating head between said cylinders, said structure having a portion which overlaps said flange and exceeds in diameter the external diameter of the high pressure cylinder; studs fixed in said overlapping portion and extending through said flange; and nuts on said studs and accessible externally to said cylinders.</p>	<p>80</p>
<p>10 5. The combination of a high pressure cylinder having an annular external flange at one end; a larger, low pressure cylinder connected with said flange; a stuffing box structure removably</p>	<p>EMIL GRIESHABER.</p>	<p>85</p>
<p>15</p>		<p>90</p>
<p>20</p>		<p>95</p>
<p>25</p>		<p>100</p>
<p>30</p>		<p>105</p>
<p>35</p>		<p>110</p>
<p>40</p>		<p>115</p>
<p>45</p>		<p>120</p>
<p>50</p>		<p>125</p>
<p>55</p>		<p>130</p>
<p>60</p>		<p>135</p>
<p>65</p>		<p>140</p>
<p>70</p>		<p>145</p>
<p>75</p>		<p>150</p>