J. TONGE.

HYDRAULIC BREAKING DOWN APPLIANCE.

APPLICATION FILED SEPT. 16, 1918.

1,354,861.

Patented Oct. 5, 1920.

2 SHEETS—SHEET 1.

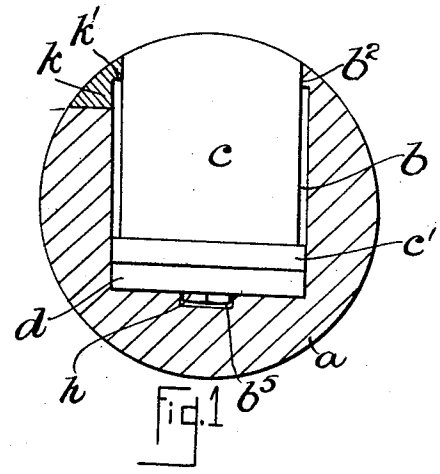


Fig. 1

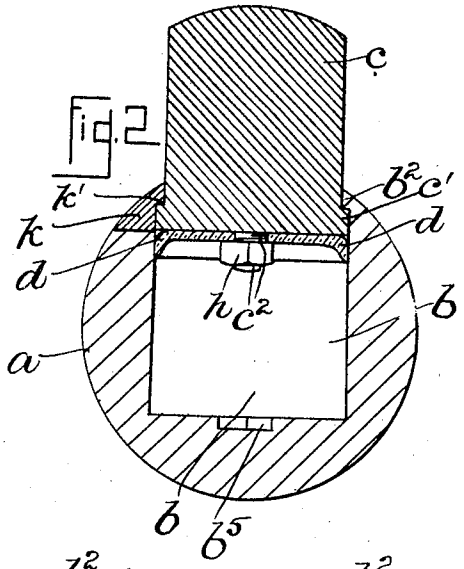


Fig. 2

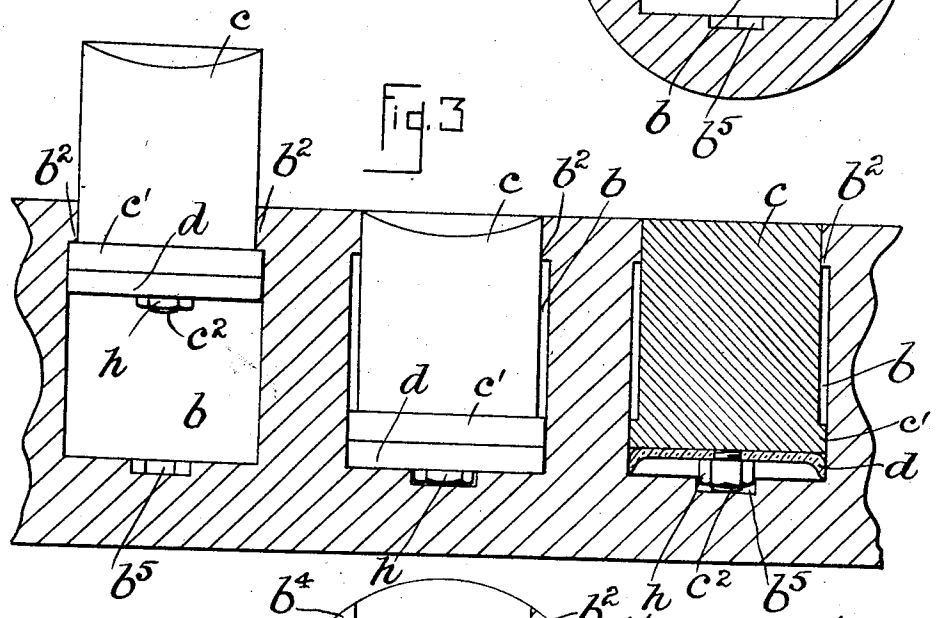


Fig. 3

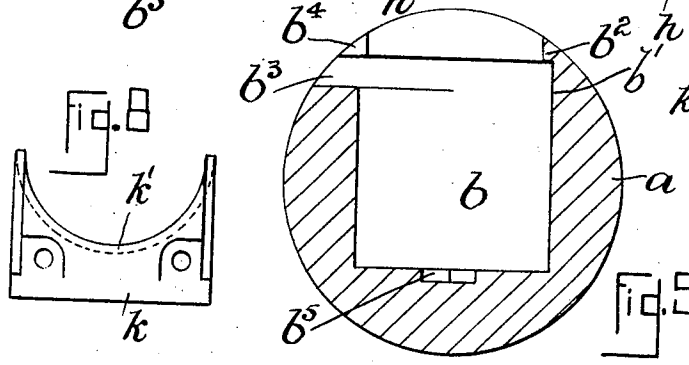


Fig. 5

Fig. 8

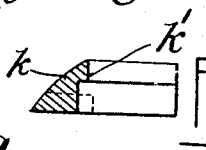


Fig. 9

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2 SHEETS—SHEET 2.

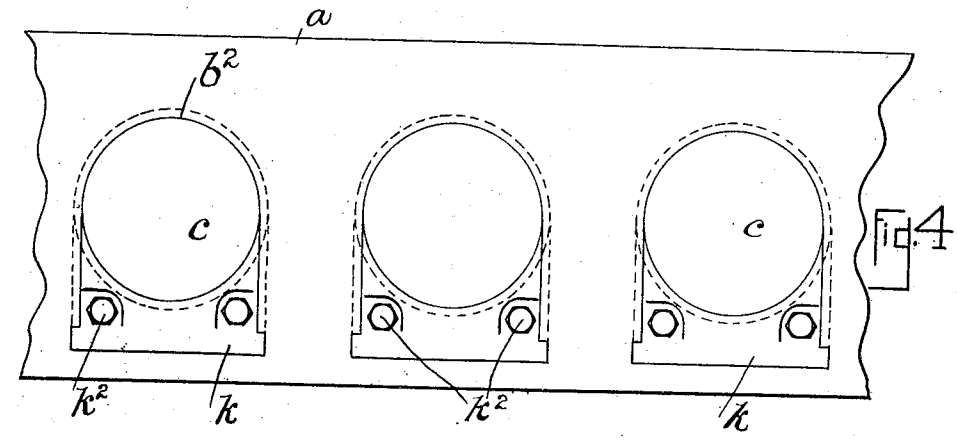


Fig. 4

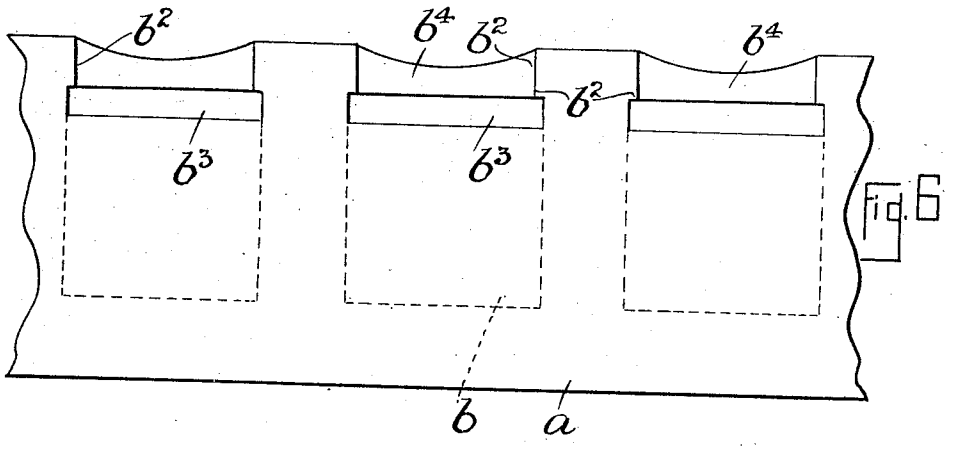


Fig. 6

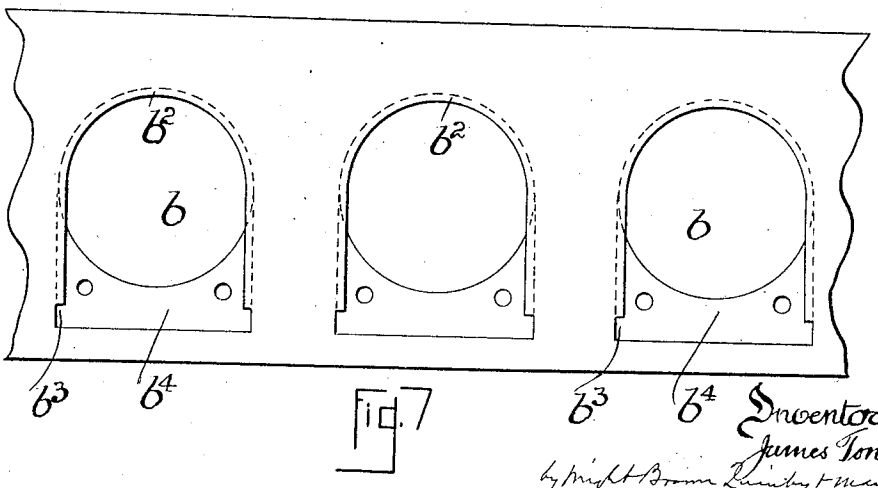


Fig. 7

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UNITED STATES PATENT OFFICE.

JAMES TONGE, OF WESTHOUGHTON, NEAR BOLTON, ENGLAND.

HYDRAULIC BREAKING-DOWN APPLIANCE.

1,354,861. Specification of Letters Patent. **Patented Oct. 5, 1920.**

Application filed September 16, 1918. Serial No. 254,344.

To all whom it may concern:

Be it known that I, JAMES TONGE, a subject of the King of Great Britain, and resident of Westhoughton, near Bolton, in the county of Lancaster, England, have invented a certain new and useful Improvement in Hydraulic Breaking-Down Appliances, of which the following description, having reference to the accompanying drawings, is a specification.

My invention relates to hydraulic presses, particularly for use in the breaking down of coal or other minerals, in breaking up concrete blocks such as engine beds, and for other similar purposes. This class of hydraulic press comprises a body part for insertion in an opening previously formed by boring or the like. Within said body part is or are mounted one or more series of pistons or rams. These latter, on water being forced into said main or body part, travel in directions somewhat radially thereof, such pistons being either simple or single travel pistons, or those of multiple form which are arranged in two or more parts each of which has a traverse separate from that or those to which it is connected. Heretofore in connection with these hydraulic presses it has been customary to limit the travel outwardly of each of the single pistons or each of the main pistons (or that which has least travel) by inserting in the body part a sliding plate or plates the inner surface of which is of the same diameter as that of the main part of the piston or ram. A flange mounted on such piston comes into contact with said plate thus to effect the limiting of its movement outwardly as desired. It has been found that these devices are somewhat difficult to manufacture and assemble, in addition to which the amount of the travel of the piston is to some extent restricted. It is also necessary, in order to effect the assembling of the parts, to form the piston, when such has only a single travel, in two portions, one of which has to be screwed into the other after the latter has been placed in position within its cylinder. The object of my present invention is to produce a hydraulic press of an improved construction, such improved construction consisting in forming the stop plate for limiting the piston's travel integrally with the body part of the press, beneath or in proximity to which the single piston or compound piston may easily be slid. The piston affords a longer travel than heretofore, while the simple or single travel type of piston may be formed in one piece.

In the accompanying drawings, which illustrate my invention:—

Figure 1 is a sectional end elevation of a hydraulic press and one of the rams, this latter being of simple form.

Fig. 2 is a similar view to Fig. 1 but shows the ram in section and in its extended position.

Fig. 3 is a side sectional elevation showing three of said rams, two in their closed positions with one in section, and the other when extended, although in actual practice these rams of course occupy approximately the same positions within the body of the press. The channels for supplying water to the cylinders are not shown, as they do not form part of my invention.

Fig. 4 is a plan of my improved press.

Fig. 5 is a cross sectional elevation of the body of the hydraulic press before the rams are placed in position therein, showing one of the openings into which a ram has to be fitted.

Fig. 6 is an elevation of the body of the hydraulic press.

Fig. 7 is a plan thereof.

Fig. 8 is a plan of an additional plate or cover hereinafter described.

Fig. 9 is a sectional elevation thereof.

Similar letters and figures of reference indicate like parts throughout the several views.

In carrying my invention into effect I form the body part *a* of the press somewhat in the usual manner, that is, it has a series of cylinders *b* extending on one side of said body part (as shown by the drawings) or if desired it may have one series extending in one direction and another series extending in the opposite direction, this alternative form not being illustrated as it is common and well known. Usually each cylinder *b* is of the same diameter throughout its depth, however I now form these cylinders *b* of two diameters the body portion being of larger diameter than the upper or outer part b^2 which latter forms an inwardly extending flange around a portion of the outer end of said cylinder *b*. It is this flange b^2 which forms the stop or limits the travel of the piston or ram *c* the flange c^1 on which fits against said flange b^2 when said piston has reached the extent of its travel. A hori-

zontally disposed slot or opening b^3 extends from beneath said flange b^2 to the outside of the body part a, this opening being of the same diameter or width as the larger diameter b^1 of the cylinder b and also of the same diameter as the flange c^1 on the piston or ram c. Said slot or opening b^3 is of a depth approximately that of the thickness of said flange c^1. Another opening b^4 (adjoining the slot b^3) is formed through the body part a this being of the same width as the diameter of the body part of the piston c. It will be seen that the piston c may readily be slid into its position within or above the cylinder b by the flange c^1 passing through the slot b^3 and the body part through the opening b^4 and when it reaches a position within or above the cylinder b it may then pass downwardly or toward the center of the press.

The hydraulic leathers d may have plain surfaces for contact with the lower surfaces of the pistons or rams c and they may be pressed into the cylinders b through the ends thereof or passed through the grooves b^3 prior to the insertion of said rams c which will afterward press them firmly against the bases of the cylinders b. Or I may fasten said leathers d to the rams c for which purpose I form openings centrally therein through which may pass the screwed projections c^2 on said rams. To secure said leathers in position upon said pistons after having been placed within said cylinders b I form openings b^5 in the bases of the cylinders b for the reception of the nuts h, said openings being of the same shape as said nuts, thus after the pistons c have been placed in position within said cylinders b they may be rotated for the purpose of causing the projecting screwed parts c^2 to be screwed within said nuts h which latter thus will then hold the said leathers firmly in position.

I mount plates k having shoulders k^1 each plate being used to fill both the slots b^3 and openings b^4 after the parts have been assembled, they being retained in position by nuts k^2 or the like, thus borings or other refuse are prevented from entering the cylinders b and leakage of the pressure water in the cylinders b is effectually prevented. These plates k also guide the pistons c in their movements and effectually prevent them from tilting in the cylinders b.

Heretofore where sliding plates have been employed to limit the motion of the pistons or rams, the amount of such motion or traverse has been regulated by the distance from the bottom of the cylinder to the lower surface of the stop plate. This causes the ram or piston to have to be placed in position within the cylinder before said plate was slid into its slot or opening, hence said piston had to be formed in two parts, one part being screwed upon the other after the latter had been assembled in position, whereas with my present invention the length or depth of the piston or ram does not interfere with the assembling of the several parts, thus it can be formed in one piece as illustrated. Further than this, by the flange or stop b^2 being at the periphery of the hydraulic press a longer traverse is given to the piston or rams than has heretofore been the case.

I have only illustrated a single or simple ram or one having a single traverse, but it will readily be understood that duplex rams or those having a greater number of separate traverses may be employed, although I do not illustrate these latter as they are well known and the traverse of the main portion of such pistons or rams is similar to that of a piston of single travel.

Such being the nature and object of my said invention, what I claim is:—

1. In a hydraulic breaking down appliance, a body part, a series of cylinders formed therein, pistons operating in said cylinders, flanges on said pistons, stop pieces for said flanges formed integrally with said body part, and openings and grooves formed in said body part through which the pistons are slid when being assembled in position.

2. In a hydraulic breaking-down appliance, a body part, cylinders formed therein, pistons operating in said cylinders, screwed projections on said cylinders, hydraulic packing leathers, nuts for fitting over said screwed projections, and openings formed in said body part at the lower ends of the cylinders to prevent rotation of said nuts.

3. In a hydraulic breaking-down appliance, a body part, cylinders formed therein, pistons operating in said cylinders, integral flanges or stop pieces for said pistons, openings formed in said body part to allow the assembling of said pistons, and plates for covering said openings.

4. In a hydraulic breaking-down appliance, a body part, cylinders formed therein, pistons operating in said cylinders, flanges formed integrally with the body part at the outer ends of said cylinders and plates provided with flanges corresponding to those formed at the outer ends of the cylinders.

JAMES TONGE.