F. A. FAY.

SCREW PUMP.

APPLICATION FILED APR. 13, 1920.

1,430,894. Patented Oct. 3, 1922.

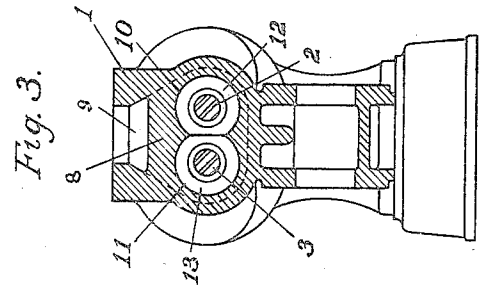


Fig. 3.

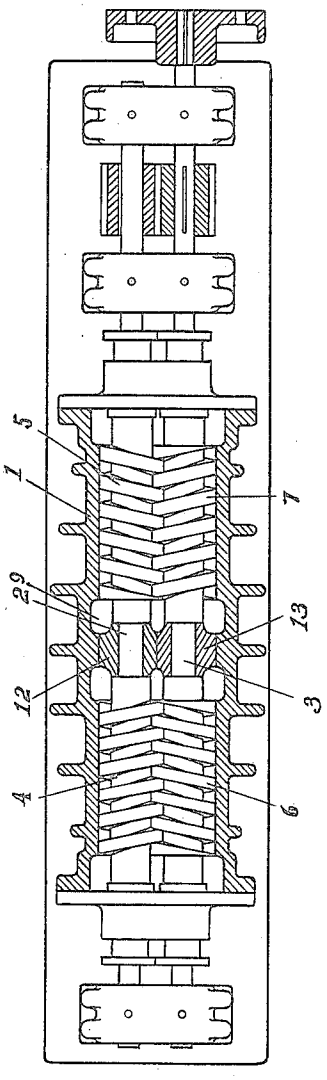


Fig. 1.

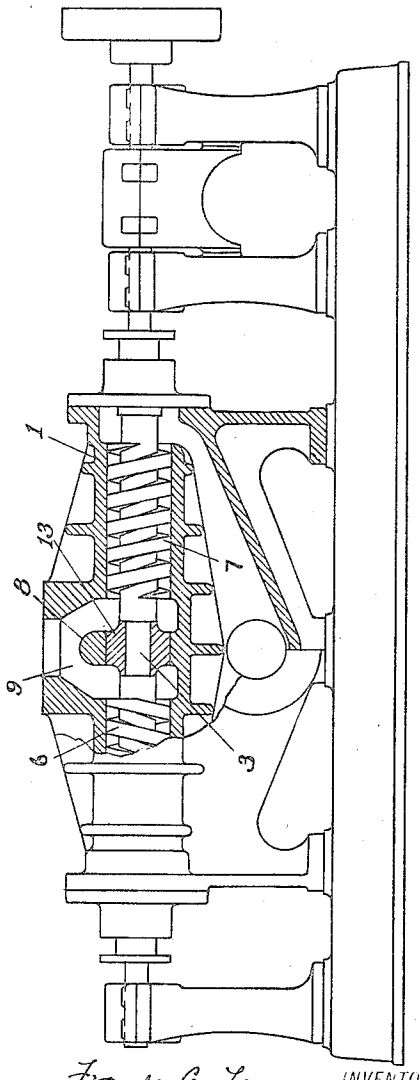


Fig. 2.

Frank A. Fay INVENTOR

BY W. B. Whitney

ATTORNEY

Patented Oct. 3, 1922. 1,430,894

UNITED STATES PATENT OFFICE.

FRANK A. FAY, OF CALDWELL, NEW JERSEY, ASSIGNOR TO WILLIAM E. QUIMBY, INC., OF NEWARK, NEW JERSEY, A CORPORATION OF NEW YORK.

SCREW PUMP.

Application filed April 13, 1920. Serial No. 373,623.

To all whom it may concern:

Be it known that I, FRANK A. FAY, a citizen of the United States, residing at Caldwell, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Screw Pumps, of which the following is a specification.

This invention relates to a screw pump of the type illustrated in Letters Patent No. 529,837, issued on November 27, 1894, to William E. Quimby, in which two pairs of intermeshing screws, right and left and left and right, respectively, are mounted in the same horizontal plane on parallel shafts journaled in bearings in the heads of a shell bored to fit the perimeters of the unintermeshed portions of the screws. The screws have threads of two or more convolutions and projecting hollow cores which, by holding the outer ends of the threads spaced apart from the heads of the casing and their inner ends spaced apart from each other, provide two end chambers and one centrally located chamber, and the necessary inlet and outlet openings to these chambers are formed through the lower and upper walls of the casing.

It has been found in practice that such a pump, while exceedingly efficient with low pressures, could not be used commercially with pressures exceeding about two hundred pounds per square inch, since the wearing away not only of the screws but of the inner walls of the shell, due to the unbalanced portions of the screws adjoining, and the vertical thrust on the screw shafts within, the central chamber soon produced a slip of the fluid which destroyed the efficiency of the pump.

By my present invention, which consists briefly in providing additional bearings for the two shafts within the chamber at the center of the shell, I have obviated this difficulty and have produced a pump which can be operated efficiently at pressures of five hundred pounds and upwards and hence has a new and much wider field of utility, being adapted, for example, for use as a high pressure pump for pumping heavy fuel oils.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a plan view, partly in horizontal section, of a Quimby screw pump embodying my improvements; Fig. 2, a side elevation, partly in vertical section; and Fig. 3, a transverse vertical section at the longitudinal center of the shell.

As here shown, the shell 1 is mounted upon the usual bed-plate, and the two shafts 2 and 3, carrying the screws 4 5 and 6 7 and extending through stuffing boxes in the heads of the shell, are journaled in bearings in standards carried by the bed-plate and are geared together and driven by a pulley fixed to the end of one of the shafts, all in the usual or in any suitable manner.

For the new intermediate bearings for the screw shafts, a standard is provided by a partial transverse wall 8, which divides the lower part only of the slightly elongated central chamber 9 and has formed therein intersecting cylindrical openings 10 and 11 corresponding to the bore of the shell and in alignment therewith, and two collars 12 and 13, flattened along one side, which, serving as journal boxes, are rotatably secured upon the respective shafts between the opposed ends of the hollow cores of the screws and, when the parts of the pump are assembled, fit into and are held against rotation within the openings in the standard. The two collars may, of course, be integral, if desired.

By the central bearing support thus provided for the screw shafts, the unbalanced portions of the exposed screw threads are counter-balanced and the wear to which the parts have heretofore been subjected by the vertical thrust thereon is substantially eliminated, and what has been for all practical purposes a low pressure pump is converted into an efficient and durable high pressure pump.

What I claim as new, and desire to secure by Letters Patent, is—

1. A screw pump of the type described comprising a suitable casing, two parallel shafts journaled in bearings in the heads of the casing and mounted thereon two pairs of intermeshing right and left screws with threads having a plurality of convolutions and held spaced apart at their inner ends to form within the shell a short centrally located chamber open throughout to the ends of the screws, and a supplementary bearing for the screw shafts intermediate the opposed inner ends of the screws.

2. In a screw pump of the type described, the combination, with a suitable shell and

two pairs of intermeshing right and left screws mounted upon parallel shafts mounted in the heads of the shell and spaced apart at their inner ends to form within the shell a short central chamber open throughout the ends of the screws, of means providing a bearing for the shafts within the central chamber which permit the assembling of the parts of the pump with the screws in place upon the shafts.

3. In a screw pump of the character described, the combination with a suitable shell and two pairs of intermeshing right and left screws, with threads having a plurality of convolutions and hollow cores projecting from the ends thereof, mounted upon parallel shafts journaled in the heads of the shell, of an intermediate bearing support for the screw shafts comprising a partial transverse wall which is located centrally of and partially divides the shell and has formed therein intersecting openings in alignment with and of a size permitting the passage of the screws, and journal boxes which are rotatably secured upon the shafts between the opposed inner ends of the hollow cores of the screws and when the parts are assembled fit into and are held against rotation within the said openings in the transverse wall.

FRANK A. FAY.