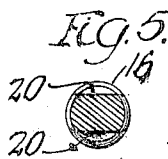
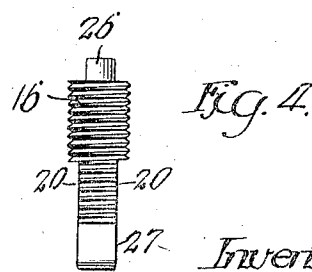
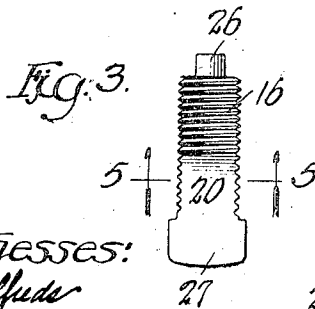
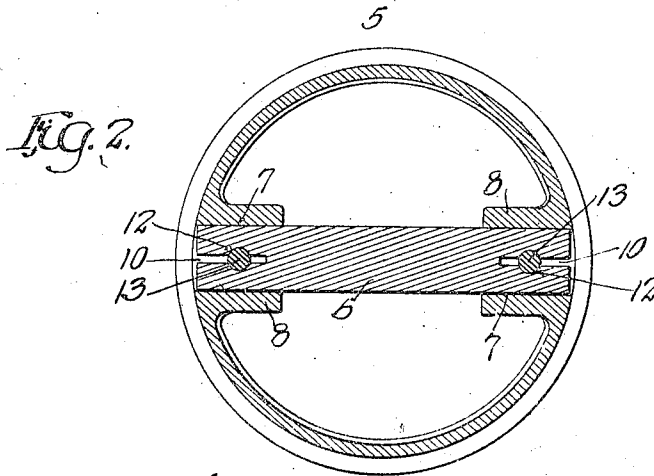
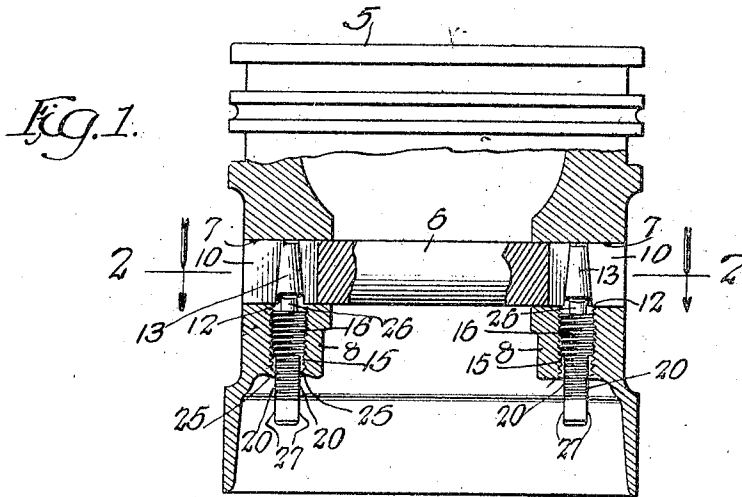


A. LEVEDAHL.
SET SCREW.
APPLICATION FILED APR. 10, 1909.

942,506.

Patented Dec. 7, 1909.



Witnesses:
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UNITED STATES PATENT OFFICE.

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SET-SCREW.

942,506.

Specification of Letters Patent.

Patented Dec. 7, 1909.

Application filed April 19, 1909. Serial No. 490,691.

To all whom it may concern:

Be it known that I, AXEL LEVEDAHL, a citizen of the United States, and a resident of Aurora, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Set-Screws; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the numerals of reference marked thereon, which form a part of this specification.

This invention relates to means for locking or holding set-screws from rotation, more particularly intended for use in connection with set-screws inserted in parts which are subject to great jar and vibration such, for instance, as the piston of an internal combustion engine.

The invention consists in the matters hereinafter set forth and more particularly pointed out in the appended claims.

In the drawings:—Figure 1 is a view, partially in elevation and partially in section, of a piston head, illustrating my invention applied thereto. Fig. 2 is a cross-sectional view taken upon line 2—2 of Fig. 1. Fig. 3 is a view in side elevation of the set-screw shown in Figs. 1 and 2. Fig. 4 is a view of the set-screw in a different position. Fig. 5 is a cross-sectional view of the set-screw, taken upon line 5—5 of Fig. 3.

In the said drawings, 5 designates a hollow piston, of common form, which is provided within the same with a transversely extending pivot-rod 6 by means of which the piston is secured to the piston head. The said pivot-rod 6 has its ends inserted in transverse sockets 7, 7 extending through two oppositely located projections 8, 8 which are formed upon the opposite parts of the cylindric wall of the said piston and extend inwardly therefrom. The said pivot-rod 6 is adapted to be secured at its ends in the sockets 7, 7 and for this purpose the ends of the said pivot-rod which rest in the said sockets are split or provided with longitudinally extending slots 10, 10 which permit the ends of the said pivot-rod to be spread or expanded. Extending transversely of the pivot-rod, with their longitudinal axes in the planes of said slots, are holes or passages 12, 12 which are tapered from end to end. The said tapered holes 12, 12 are adapted to receive correspondingly tapered

pins or wedges 13, 13 which, when forced therein, act to expand or press outwardly the portions of the pivot-rod on each side of the slots 10, 10. The forcing out or expanding of the said parts presses them tightly against the walls of the sockets 7, 7 and serves to secure the pivot-rod 6 firmly in place. The said pins are inserted into the holes 12, 12 through apertures 15, 15 which extend through the portions of the projections 8, 8 exterior to the passages 7, 7 and in line with the said holes 12, 12 in the pivot-rod 6. The apertures 15, 15 are screw-threaded and are adapted to receive set-screws 16, 16 which bear at their inner ends against the larger ends of the wedges 13, 13 and by means of which the said wedges 13, 13 are forced into the holes 12, 12 to expand the ends of the pivot-rod 6.

To provide for locking or holding the set-screws from turning backwardly after they have been inserted and tightened against the part to be secured or held in place thereby, a construction is provided as follows: The set-screws 16, 16 are screw-threaded throughout the greater portion of their lengths. Each of said set-screws is provided at its outer end with two lateral locking faces 20, 20, shown as made by cutting away the metal at opposite sides of the screw so as to form two flat faces. The said locking faces 20, 20 are of such length that the inner ends thereof extend inwardly beyond the outer end of the screw-threaded aperture 15 when the set-screw is in place. The set-screw, thus provided with flat faces 20, 20 extending into the screw-threaded aperture which receives said set-screw, is held from turning after the set-screw has been screwed into place by upsetting or swaging the metal at the sides of the aperture 15 so as to bring the same into contact with the said flat faces 20, 20, thereby locking the set-screw from rotation. In other words, the swaging of the metal at the sides of the aperture forms inwardly extending projections 25, 25 which bear against the flat faces 20, 20 and serve to lock the said set-screw against turning under the jarring produced by the rapid movements of the piston. The partial screw-threads remaining upon the portion of the set-screw between the flat faces 20, 20 act to cut away the projections 25, 25 when the set-screw is turned backwardly by a wrench to remove the same.

The inner ends of the set-screw may be provided with reduced cylindric portions 26, adapted to enter each of the apertures in the pin 6 when the set-screws are used in connection with wedges 13, 13, as shown. The outer ends of said set-screws are shown as provided with flattened heads 27, 27 to which a wrench may be applied for inserting and removing the said set-screws.

It is to be understood that the details of construction illustrated in the accompanying drawings may be considerably varied without departing from the spirit of the invention and I do not wish to be confined to such details except as they are hereinafter made the subject of specific claims. As, for instance, the set-screw may have only one locking face, or may have its outer end cut away laterally in any manner or in any form adapted to make the same non-cylindric, or to provide a locking face or faces which may be engaged by an integral part of the metal at the outer end of the hole in which the set-screw is inserted, which is, by a swaging operation, extended partially across the hole and bears against the locking face or faces in a manner to hold the screw from backward rotation or becoming loosened.

I claim as my invention:—

1. The combination with a metal part provided with a screw-threaded hole, of a set-screw which is inserted in said screw-threaded hole; said set-screw being provided with a longitudinally extending, lateral, locking

surface on the portion of its screw-threaded length which is located within the outer end of the screw-threaded hole, and the metal of the said part in which the set-screw is inserted at the outer end of the said screw-threaded hole being swaged inwardly to form an integral projection which, by its contact with the locking face of the set-screw between the ends of the screw-threaded portion, holds the latter from turning.

2. The combination with a metal part, provided with a screw-threaded hole, of a set-screw which is inserted in said screw-threaded hole, said set-screw being provided with two oppositely located flat faces which extend along said screw for a portion of the screw-threaded length thereof, and the inner ends of which extend into the screw-threaded hole, said part in which the set-screw is inserted being provided with inwardly extending projections which are formed by swaging inwardly the metal at the outer end of the screw-threaded hole and which engage the flat faces of the set-screw between the ends of the screw-threaded portion thereof to lock the latter against rotation.

In testimony that I claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 16 day of April A. D. 1909.

AXEL LEVEDAHL.

Witnesses:

CHAS. H. GREENE,
R. A. VORLING.