

H. H. BLACHE.

SCRAPING RING FOR SCRAPING OIL FROM CYLINDERS, PISTON RODS, OR THE LIKE.

APPLICATION FILED SEPT. 6, 1918.

1,327,801.

Patented Jan. 13, 1920.

Fig 1

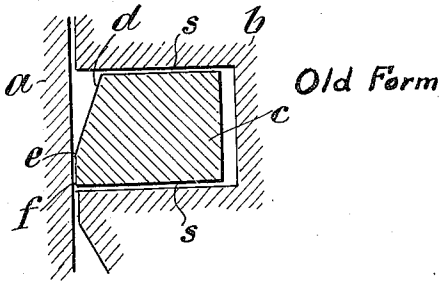


Fig 2

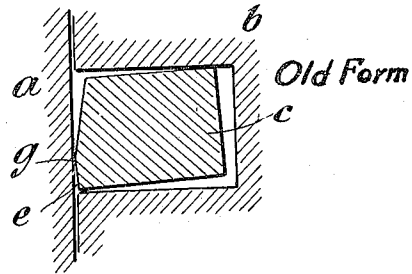


Fig 3

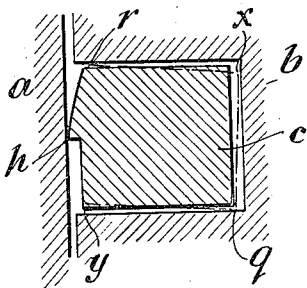


Fig 5

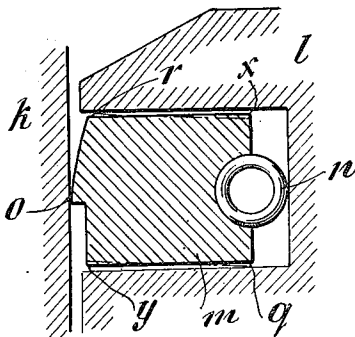
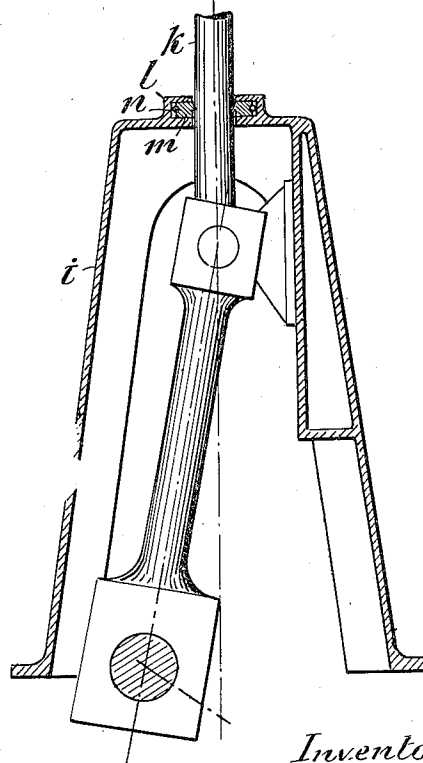


Fig 4



Inventor
Hans Henrik Blache
By *Louis B. B. B.*
Attorney.

UNITED STATES PATENT OFFICE.

HANS HENRIK BLACHE, OF COPENHAGEN, DENMARK.

SCRAPER-RING FOR SCRAPING OIL FROM CYLINDERS, PISTON-RODS, OR THE LIKE.

1,327,801.

Specification of Letters Patent.

Patented Jan. 13, 1920.

Application filed September 6, 1918. Serial No. 252,982.

To all whom it may concern:

Be it known that I, HANS HENRIK BLACHE, citizen of the Kingdom of Denmark, residing at No. 30 Jakobsgrade, Copenhagen, Denmark, have invented certain new and useful Improvements in Scraper-Rings for Scraping Oil from Cylinders, Piston-Rods, or the like, of which the following is a specification.

The present invention relates to an improvement in scraper rings for scraping oil from the inner faces of cylinders, the outer faces of piston rods or the like, and the invention is mainly characterized by the scraping edge being located at or near the center of the scraper ring. The best effect is attained when the scraping edge is placed somewhat above the center of the ring, as in that case the unavoidable tilting of the ring relatively to the piston will only increase the scraping action exerted by the ring.

Earlier forms of scraper rings have been subject to the drawback that the tilting of the ring, relatively to the member supporting the ring, has caused the scraping to be less efficient as the ring, when tilted, did not present a sharp edge against the surface from where the ring was to scrape the oil. As a matter of fact, unless the ring presents a sharp edge against the surface covered by the oil film, it will slide on the latter, without removing it from the surface.

The drawing illustrates the previously used construction as well as various manners of constructing the scraper ring here referred to.

Figures 1 and 2 show the previously used form for scraper rings,

Fig. 3 a manner of constructing a scraper ring designed according to the present invention,

Fig. 4 the scraper ring as used for scraping a piston rod, and

Fig. 5 shows, on a larger scale, the ring indicated in Fig. 4.

The previously used form of scraper rings illustrated in Figs. 1 and 2 has the defect that the ring *c*, provided for scraping for instance the interior surface *a* of a cylinder, will not occupy the position in the piston *b* represented in Fig. 1, where a uniform play is obtained both at top and at the bottoms for the ring *c*, as indicated at *s*, and where the lower or working portion *f* of the outer face of the ring is parallel with the wall *e* of the cylinder *a*; but, on the contrary, will

seat itself in the manner shown in Fig. 2, where the ring *c* will assume the tilted position in Fig. 2. If the ring would remain in the position shown in Fig. 1, the sharply cut face *f* of the ring would scrape away any oil splashed on the cylinder surface *e* and drive it down into the crank case, when the piston moves downward; but owing to the pressure of the cylinder against the surface *f*, the ring takes the position shown in Fig. 2, where only the corner *g* of the ring formed at the intersection of the two surfaces *d* and *f* touches the cylinder *a*. In this position of the ring, the surface *f* is also in a skew position relatively to the cylinder surface, and the ring will therefore slide on the oil film, without removing it.

In order to remedy the above mentioned defect, the ring is shaped as indicated in Fig. 3, where *a* indicates the cylinder as before, and *b* the piston or the member holding the ring. *c* indicates the ring on whose lower half a portion of the surface facing the cylinder is machined away, so that there is produced at or somewhat above the center of the ring a closed, circumferential groove, or recess which extends entirely around the ring and which, in turn, produces an abrupt ledge or shoulder *h* at its inner side, said shoulder likewise encircling the ring. The bottom wall, so to say, of the recess, is made parallel and concentric with the inner face of the ring and hence is coaxial with the ring, while the inner wall of said recess is disposed substantially perpendicular to said bottom wall, as clearly represented in Fig. 3. Above the shoulder *h*, the ring is beveled in the ordinary manner, corresponding to the formerly used bevel at the face *d*, the beveling having the obvious effect of thinning or sharpening said shoulder, which is thereby converted into a scraping edge. Owing to the cylinder pressing against the ring at the edge *h*, located at or somewhat above the center of the ring, the latter will assume the position indicated by dotted lines, its edges *r* and *q* touching the piston, while the edges *x* and *y* are moved away from the piston in consequence of the tilting. Notwithstanding the tilting of the ring, the latter will always have a sharp corner at *h* resting against the cylinder, and the scraping power of the ring is rather increased than decreased by the tilting of the ring.

In the construction shown, by way of example, in Fig. 3 the ring is assumed to be

placed on a piston, but the invention may also be applied to rings located exteriorly of a cylinder, for instance rings for scraping a piston rod passing into the crank case of an engine with forced lubrication. This is indicated in Fig. 4, where *i* is the crank case and *k* the piston rod, while *l* indicates the crank case bush holding the scraper ring. Here the ring *m* cannot be made self-adjusting, and it is therefore made in several pieces pressed against the piston rod *k* by means of an annular spiral spring *n* encircling the ring sections. The arrangement is shown, on a larger scale, in Fig. 5, where the same reference letters are used. As in case of the above mentioned self-adjusting rings for scraping cylinders, the ring is here formed with a scraping edge *o*, located at or somewhat above the center of the ring, at the same level as the spring *n* or somewhat higher so that the pressure exerted by the spring on the ring will have a tendency to twist the ring as indicated by the dotted lines, so that the edges *r* and *q* of the ring will rest against the bush *l* while the edges *x* and *y* are turned away from the corresponding faces of the bush.

Patent claims:

1. A scraper ring having a portion of the face confronting the surface to be scraped cut away to form a closed, circumferential recess, the bottom wall of which is substantially coaxial with the ring and the inner

wall of which is substantially perpendicular to said bottom wall and is disposed near the median plane of the ring; the portion of the said recessed face of the ring above said inner wall having a gradually-decreasing diameter from its inner to its outer edge, thereby producing a sharpened scraping step or shoulder which extends entirely around the ring; substantially as described.

2. A scraper ring split radially to form a plurality of sections, and an annular spring encircling said ring and bearing against the outer face thereof so as to force said sections radially inward; said scraper ring having a portion of the face that confronts the surface to be scraped cut away to form a closed, circumferential recess, the bottom wall of which is substantially coaxial with the ring and the inner wall of which is substantially perpendicular to said bottom wall and is disposed near the median plane of the ring; the portion of the said recessed face of the ring above said inner wall having a gradually decreasing diameter from its inner to its outer edge, thereby producing a sharpened scraping step or shoulder which extends entirely around the ring; said spring being so located with relation to said scraping shoulder as to press the edge thereof against the surface to be scraped.

In testimony whereof, I affix my signature.

HANS HENRIK BLACHE.