M. MORATTA.

PISTON PACKING RING.

APPLICATION FILED JAN. 15, 1917.

1,251,906.

Patented Jan. 1, 1918.

2 SHEETS—SHEET 1.

Fig. 1.

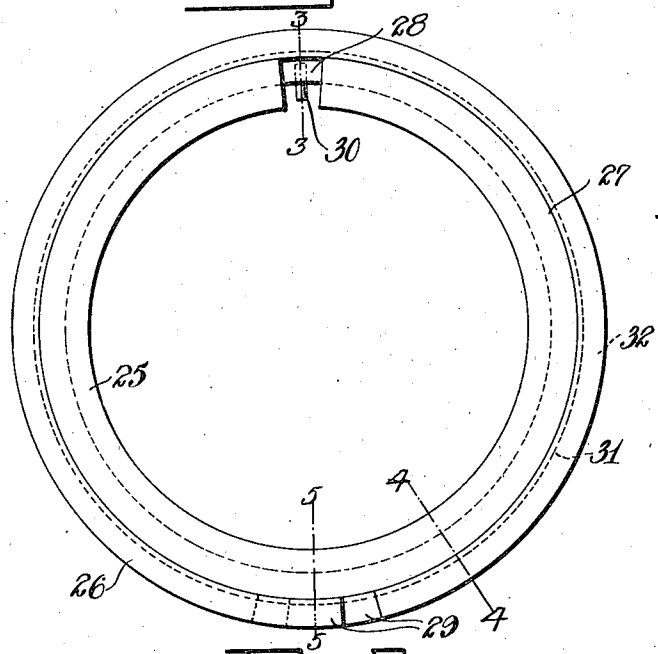



Fig. 3.

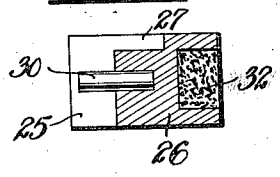



Fig. 4.

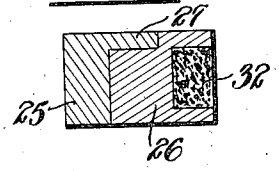



Fig. 5.

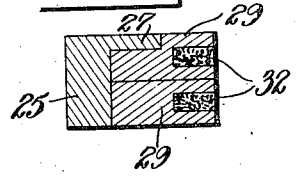



Fig. 2.

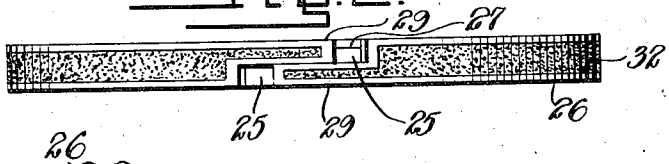



Fig. 6.

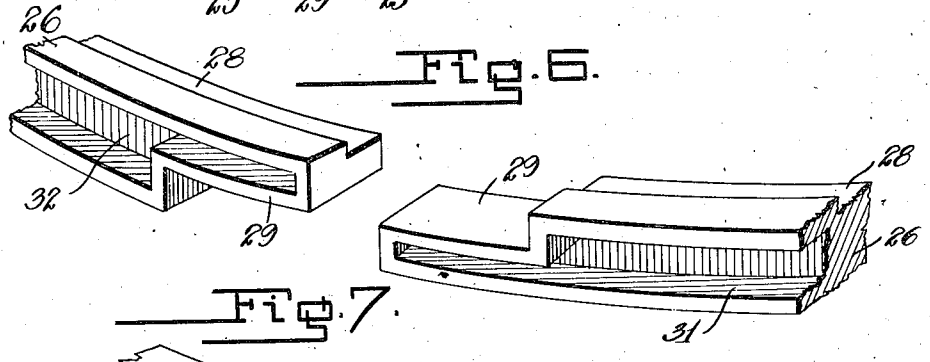
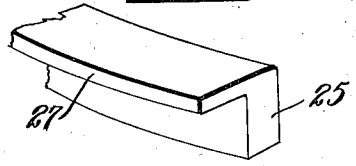



Fig. 7.




Inventor

Mathew Moratta

By Lancaster and Allwine

his Attorneys

M. MORATTA.

PISTON PACKING RING.

APPLICATION FILED JAN. 15, 1917.

1,251,906.

Patented Jan. 1, 1918.

2 SHEETS—SHEET 2.

Fig. 8.

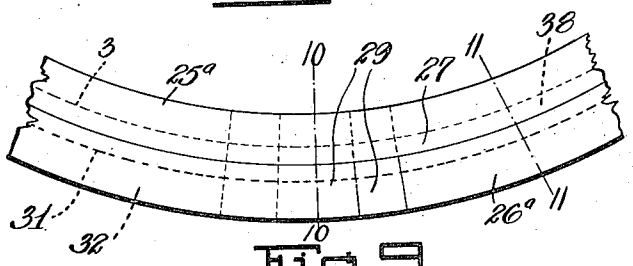



Fig. 10.

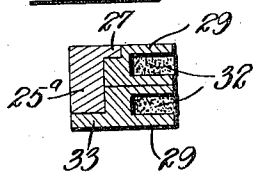



Fig. 9.

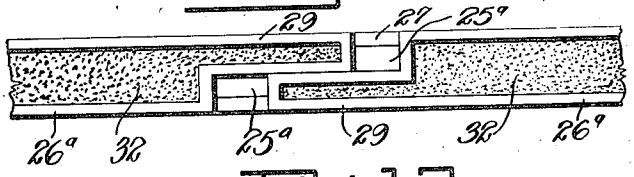



Fig. 11.

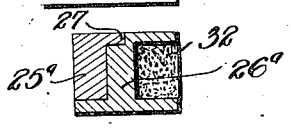



Fig. 12.

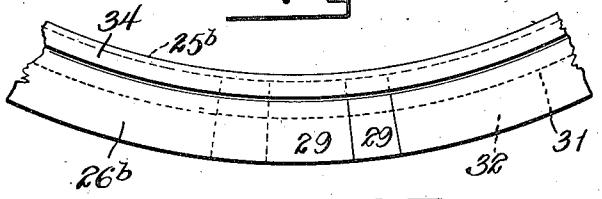



Fig. 14.

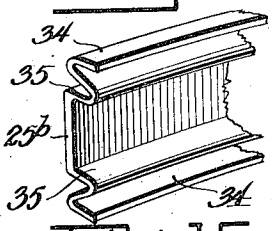



Fig. 13.

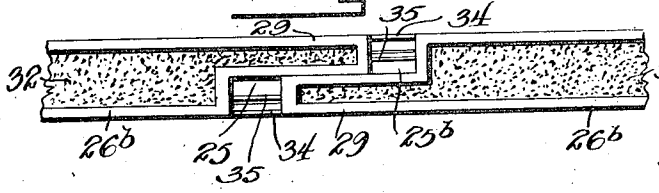



Fig. 15.

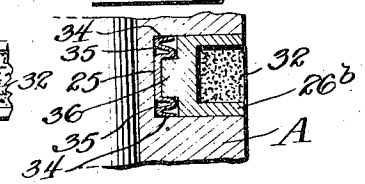



Fig. 16.

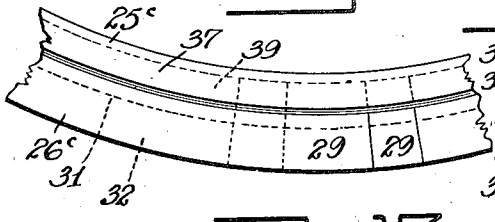



Fig. 18.

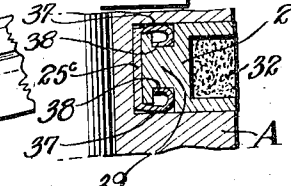



Fig. 19.

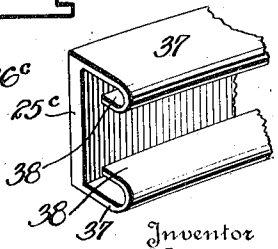
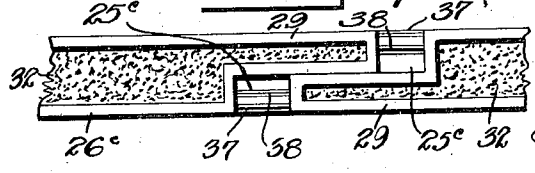



Fig. 17.




Inventor

Mathew Moratta

By Lancaster and Allwine

his Attorneys

# UNITED STATES PATENT OFFICE.

MATHEW MORATTA, OF PRINCETON, INDIANA.

## PISTON PACKING-RING.

1,251,906. Specification of Letters Patent. Patented Jan. 1, 1918.

Application filed January 15, 1917. Serial No. 142,508.

*To all whom it may concern:*

Be it known that I, MATHEW MORATTA, a citizen of the United States, and a resident of Princeton, in the county of Gibson and State of Indiana, have invented a certain new and useful Improvement in Piston Packing-Rings, of which the following is a specification.

The present invention relates to piston rings adapted for use in steam, internal combustion engine, air brake, and other cylinders, and has for an object to provide a ring of such construction that it is adapted particularly for packing pistons in the cylinder when the same has become unevenly worn or scored.

The invention further aims at the provision of a piston ring which is provided with means for carrying a quantity of graphite, or the like adapted to fill in the pits and scores in the cylinder wall and to thus pack and provide a close fit for the piston and its ring, and prevent further and undue wear upon the walls of the cylinder. This feature of the invention also embraces the provision of means for supporting a carrier body or medium for the graphite, and for a lubricant if desired to constantly and effectively apply a lubricant to the walls of the cylinder.

A further object of the present invention is to provide a two-part expansible ring possessing the above characteristics, and which is so constructed and assembled that the leakage of steam, air, or the charge of an internal combustion engine is prevented from escaping past the piston ring.

The above, and various other objects and advantages of this invention will be more fully brought out in the following detailed description of the present preferred embodiment of this invention, the same being illustrated in the accompanying drawings wherein:

Figure 1 is a plan view of a ring constructed according to the present invention.

Fig. 2 is an edge view of the same, disclosing the overlapping ends of the outer section of the ring.

Fig. 3 is a detail enlarged sectional view through one side of the ring, taken on the line 3—3 of Fig. 1 and showing the anchoring pin for holding the ring sections in interfittting relation.

Fig. 4 is a similar view taken on the line 4—4 of Fig. 1 showing the interfitting relation of the ring sections, and showing the filler of graphite or the like carried in the outer ring section.

Fig. 5 is a similar view taken on the line 5—5 of Fig. 1, showing the interfitting relation of the ring sections, and the overlapping ends of the outer section.

Fig. 6 is a detail enlarged perspective view of the meeting ends of the outer ring section, showing the peripheral groove for the reception of the graphite or the like.

Fig. 7 is a detail perspective view showing one end of the inner section.

Fig. 8 is a plan view of a portion of a piston ring, showing a modification from the form of Fig. 1, and being constructed according to the present invention.

Fig. 9 is an edge view of the same disclosing the overlapping ends of the outer ring section.

Fig. 10 is a transverse section taken on the line 10—10 of Fig. 8, showing the overlapping ends of the outer ring section and the interfitting engagement of the inner ring section therewith.

Fig. 11 is a transverse section taken on the line 11—11 of Fig. 8 showing the interfitting engagement of the ring sections at a point intermediate their ends.

Fig. 12 is a fragmentary plan view of another modified form of the packing ring constructed according to the present invention.

Fig. 13 is an edge view of the same, disclosing the overlapping ends of the outer end section.

Fig. 14 is a detail perspective view of one end of the inner ring section of the modified form of Fig. 12.

Fig. 15 is a transverse section taken through the ring of Fig. 12, showing the same as applied to the groove of a piston.

Fig. 16 is a fragmentary plan view of a further modified form of the piston ring constructed according to this invention.

Fig. 17 is an edge view of the same, showing the overlapping ends of the outer ring section.

Fig. 18 is a transverse section through the form shown in Fig. 16, showing the same as applied to the ring groove of the piston.

Fig. 19 is a fragmentary perspective view, enlarged, of the end of the inner ring section of the form shown in Fig. 16.

Referring to these drawings, and first to the form disclosed in Figs. 1 to 7, inclusive,

the ring comprises a pair of interfitting inner and outer sections 25 and 26 which are adapted to lie substantially in the same transverse plane. The inner ring section 25 comprises a substantially annular body having its extremities closely spaced apart and provided at one edge, which may be designated as the upper edge of the section, with a circumferential outwardly extending flange 27 adapted to fit in a rabbet or depression 28 formed in the upper face of the outer section 26. The ring sections 25 and 26 are substantially of the same thickness, and normally, the upper and lower faces thereof are adapted to lie flush. The outer section 26 is also of substantially annular form and has its extremities 29 oppositely reduced and overlapped to provide an overlapping joint for the ring section, as clearly shown in Fig. 2.

The outer ring section 26 is provided at its inner side, and midway between its overlapping ends 29, with an inwardly projecting pin 30 adapted to lie between the closely-spaced-apart ends of the inner ring section 25 to engage the latter and hold the inner ring section from turning within the outer section. The pin 30 thus holds the sections in circumferential overlapping relation to prevent the working of the spaced-apart ends of the ring sections to one side of the ring.

The outer ring section 26 is provided in its periphery with a longitudinal groove 31 which extends entirely around the ring, and which is reduced and co-extensive with the extremities or tongues 29 of the outer section. This groove 31 is adapted to contain a quantity of graphite 32 which is preferably admixed with asbestos, the latter providing a carrier or retainer for the graphite to hold the same within the groove and for ready application to the walls of the cylinder. If desired, a lubricant may be admixed with the asbestos and the graphite for lubricating the cylinder walls and preventing undue wear thereon. Graphite is not primarily a lubricant, but is more in the nature of a filler so that during the reciprocating action of the piston the graphite is rubbed into the pits and scores of the cylinder and is adapted to more or less fill the same and thus pack the piston tightly in the cylinder. The asbestos is found to be an excellent carrier medium for supporting the graphite in the groove 31 and for holding it in position for contact with the walls of the cylinder to take up wear upon the same. By the use of this filler material, or graphite, the inner wall of the cylinder is made to conform to the contour of the piston and its ring, and thus the piston is tightly sealed at all times in the cylinder.

In the modified form of the invention disclosed in Figs. 8 to 11, inclusive, the inner ring section $25^a$ is of substantially the same form as disclosed in Fig. 1 with the exception that it is of less width than the outer ring section $26^a$.

The outer ring section $26^a$ is provided at its lower side, and at its outer edge with a peripherally extending flange 33 adapted to lap beneath the inner ring section $26^a$ and support the same, and provide between the sections a pair of substantially parallel offset bearing surfaces arranged in stepped relation to permit of the sliding of the sections one upon the other and to provide a double seal therebetween.

A further modified form of the invention is disclosed in Figs. 12 to 15, inclusive, and wherein the inner ring section $25^b$ is relatively thin and may be formed of spring metal and slightly reduced at its opposite edges. The resilient opposite edges of the inner section $25^b$ are overturned upon themselves into substantially S-shape to provide resiliently supporting bearing flanges 34 adapted for contact with the opposite walls of the ring groove in the piston A, as shown in Fig. 15. These resiliently supported flanges 34 are adapted to bear against the walls of the ring groove sufficiently to seal the inner ring section therein, and to yield sufficiently to permit the free action of the ring in expanding and contracting.

The outer ring section $26^b$ is reduced or rabbetted at its inner side and is adapted to fit thereat between the inner flanges 35 of the S-shaped edges of the inner ring section $25^b$. The reduced inner portion of the outer ring section $26^b$ provides a tongue 36 which is mounted to freely slide between the flanges 35, and which at the same time interlocks the inner and outer ring sections together.

In the modified form shown in Figs. 16 to 19, inclusive, the inner ring section $25^c$ is relatively flat and provided at its upper and lower edges with outwardly extending peripheral flanges 37 which are rolled over toward each other at their outer edges to provide returned portions or hooks 38. The outer ring section $26^c$ is provided at its inner side with undercut slots which extend through the opposite edges of the ring and provide at the rear side of the ring a substantially T-shaped tongue or head 39 the projecting portions of which are adapted for engagement beneath the hooks 38. As shown in Fig. 18, the flanges 37 of the inner ring section are sprung outwardly from each other and are adapted for frictional engagement against the inner opposite walls of the ring groove of the piston A. The flanges or projecting portions of the tongue 39 of the outer section permit of the movement of the hooks 38 toward and from each other as the flanges 37 are submitted to compression. As in the structure shown in Fig. 15, the

flanges of the inner ring section bear against the walls of the ring groove sufficiently only to prevent leakage, and are adapted to permit the uninterrupted sliding movement of the inner ring section in the ring groove.

It will be noted that in all forms of the invention the outer ring section 26 is provided with the annular peripheral groove and the packing or filler material carried in the groove for application to the inner walls of the cylinder.

It is to be understood that various changes and modifications may be made, further than above set forth, without departing from the spirit of the invention, and being restricted only by the scope of the following claims.

I claim:—

1. In a piston ring, the combination of a pair of interfitting annular split sections in circumferentially overlapping relation, the outer section having its ends reduced and overlapped and provided with a lubricant-receiving groove extending continuously throughout the length of the outer section and being reduced and extending into said overlapping ends, and a lubricant body fitting in the groove throughout its length and into the reduced ends thereof to provide a continuous uninterrupted seal about the piston ring when in place and in various degrees of compression.

2. In a piston ring, the combination of a pair of interfitting annular split sections in circumferentially overlapping relation, the outer section being provided with a reduced inner portion, and the inner section being provided with opposed spring flanges adapted for engagement with the inner portion of said outer section for interlocking the sections together.

3. In a piston ring, the combination of a pair of interfitting annular split sections in circumferentially over-lapping relation, the inner section being provided at its opposite edges with substantially S-shaped portions providing a pair of inner flanges adapted for engagement with the opposite sides of the outer section and with a pair of outer flanges adapted to bear against the walls of the ring groove of a piston.

4. In a piston ring, the combination of a pair of interfitting annular split sections in circumferentially over-lapping relation, the outer section being provided with a tongue upon its inner side, and the inner section being provided with a pair of outwardly extending flanges for engagement against the opposite sides of the tongue for interlocking the sections together and for yieldable engagement against the opposite walls of the ring groove in a piston.

MATHEW MORATTA.