

Aug. 22, 1933.

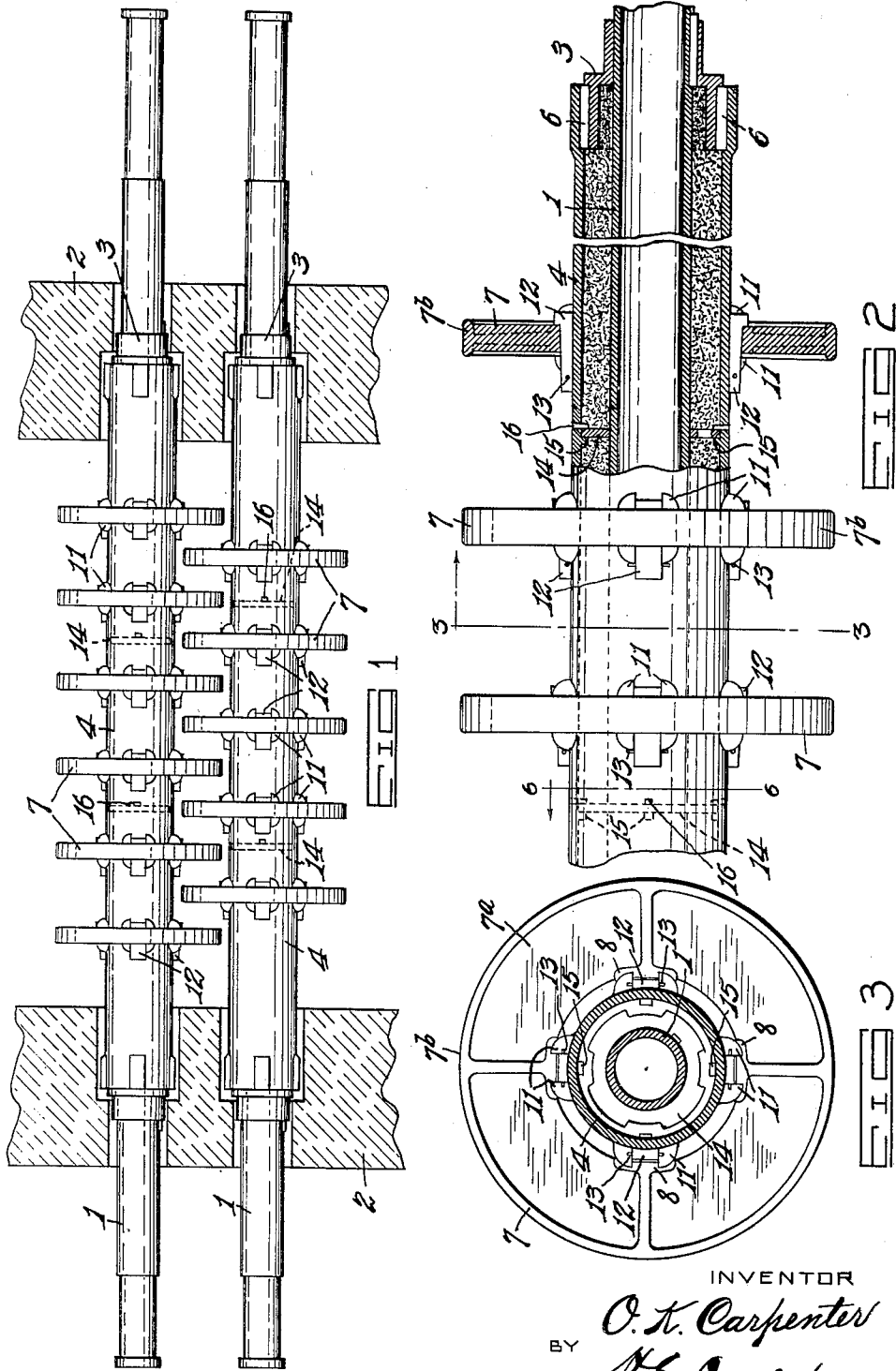
O. K. CARPENTER

1,923,772

CONVEYER FOR FURNACES

Filed Dec. 29, 1928

2 Sheets-Sheet 1



INVENTOR
O. K. Carpenter
BY
M. E. Dunlap
ATTORNEY

Aug. 22, 1933.

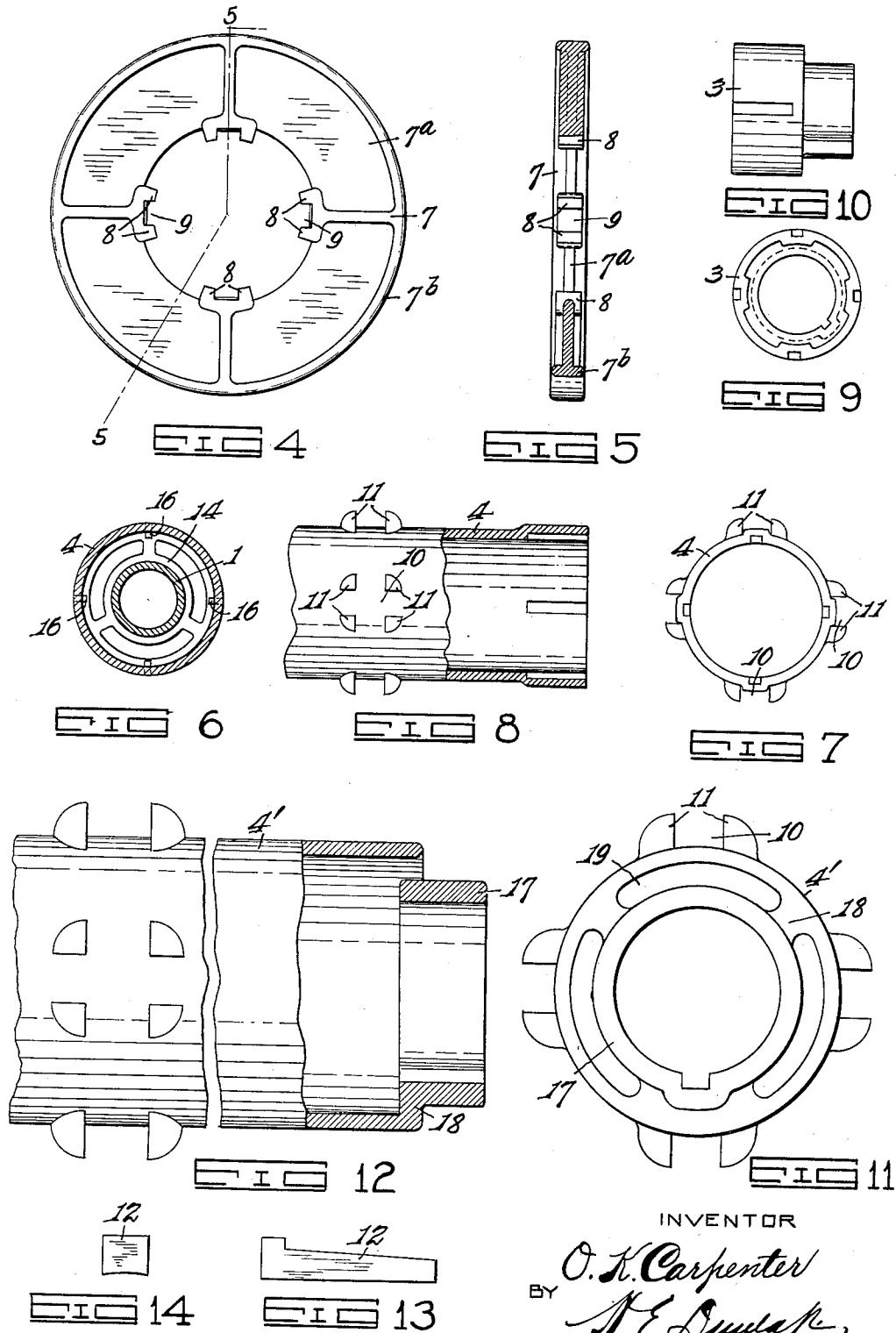
O. K. CARPENTER

1,923,772

CONVEYER FOR FURNACES

Filed Dec. 29, 1928

2 Sheets-Sheet 2



INVENTOR

BY *O. K. Carpenter*
N. E. Dunlap,
ATTORNEY

UNITED STATES PATENT OFFICE

1,923,772

CONVEYER FOR FURNACES

Oliver Karl Carpenter, New Cumberland, W. Va.,
 assignor to The Duraloy Company, Pittsburgh,
 Pa., a Corporation of Delaware

Application December 29, 1928

Serial No. 329,224

6 Claims. (Cl. 263—6)

This invention relates broadly to furnace conveyers, and more specifically to a sheath and carrying-disk structure for the shafts of such conveyers.

The primary object of the invention is to provide, in a conveyer for furnaces, a protecting sheath for the conveyer shafts whereby the latter are shielded from the high temperatures carried within such furnaces.

A further object is to provide a sheath of the character mentioned having associated therewith carrying disks upon which the metal to be treated is advanced, and to provide cooperating means whereby said sheath and disks are secured in properly assembled relation.

With these and other objects in view, the invention resides in the features of construction, arrangement of parts and combinations of elements which will hereinafter be fully described, reference being had to the accompanying drawings, in which—

Figure 1 is a top plan view of two relatively adjacent conveyer shafts embodying or equipped with my invention;

Figure 2 is an enlarged fragmentary view of the invention;

Figure 3 is a sectional elevation on line 3—3, Fig. 2;

Figure 4 is a side elevation of a carrying disk;

Figure 5 is a sectional elevation on line 5—5, Fig. 4;

Figure 6 is a section on line 6—6, Fig. 2;

Figure 7 is an end elevation of the sheath;

Figure 8 is a view of an end portion of the sheath; partly in side elevation and partly in longitudinal section;

Figure 9 is a side elevation of a sleeve supporting collar;

Figure 10 is an inner end view of said collar;

Figure 11 is an end view, further enlarged, of a modified form of sheath;

Figure 12 is a view of said modified form of sheath, partly in side elevation and partly in longitudinal section; and

Figures 13 and 14 are outer end and side elevations of a key or wedge employed for securing the carrying disks in place.

Referring to said drawings, 1 designates a conveyer shaft which is preferably of tubular form to permit of circulation therethrough of a cooling medium. Said shaft is designed to be mounted transversely of the furnace chamber with its ends protruding through the opposite furnace walls 2, and is further designed to be journaled outside the furnace walls.

Mounted upon the shaft 1 and keyed thereto adjacent to its opposite ends are collars 3 which constitute supports for the opposite ends of a hollow cylindrical sheath 4. Said sheath, which has an internal diameter materially greater than the diameter of the shaft 1, has its opposite ends mounted upon the supporting collars 3 and suitably attached to the latter, as by means of keys 6.

The sheath 4 is adapted for having removably mounted thereon a plurality of relatively spaced disks 7 upon which the material to be heat-treated within the furnace is advanced. Each disk comprises a web portion 7^a, an annular rim or carrying portion 7^b, and a plurality of pairs of lugs 8 formed integrally with and projecting inwardly from said web. The lugs of each of said pairs are separated to provide an intermediate space 9 which is adapted to be disposed in register with spaces 10 provided between lugs 11 which are formed integrally with and on the exterior surface of the sheath 4. Said lugs 11 are arranged annularly of said sheath in a plurality of relatively spaced groups of four each, of which one abuts more or less closely against each of the opposite sides of each of the lugs 8 of the adjacent disk 7. Keys or wedges 12 are directed through the registering spaces 9 and 10 of the disk and sheath, respectively, for securing said disk against rotation relative to the sheath, as shown in Figs. 1, 2 and 3, and said wedges may then be secured in place either by means of pins 13 directed transversely therethrough or by electrically welding the same to the sheath. Said disks may be passed lengthwise singly along the sheath to and from their operative positions, the pairs of lugs 8 of each disk being preferably moved between the groups of lugs 11 of the sheath until the disk occupies the plane which it is to assume, following which such disk is rotated slightly to dispose its said lugs 8 between the two pairs of lugs 11 of each group. The wedges 12 are then introduced both for securing the disk in place on and to support said disk in concentric relation to the sheath.

It will be understood that the sheath is subjected to the high temperatures carried within the furnace chamber. To prevent sagging of the heated sheath under the weight of conveyed material, one or more circular disks 14 are mounted interiorly of the sheath and in seated embracing relation to the shaft 1. Where the length of the sheath renders such desirable, a plurality of such disks 14 arranged in suitably

spaced relation are employed, as shown in Figs. 1 and 2. Integral lugs 15 disposed in an annular row interiorly of the sheath constitute seats against which seat said disks 14, introduced from opposite ends of the sheath. Pins 16 directed through the wall of the sheath serve to maintain said disks in position.

In the modification shown in Figs. 11 and 12, the sheath 4' has integral reduced necks 17 formed on its ends, said necks being joined to the body of the sheath by webs 18 which, as herein shown, are provided with apertures 19.

The space between the shaft 1 and the wall of the sheath is filled with a suitable packing 20 of a suitable heat resistant or insulating material which greatly reduces the transfer of heat from the sheath to the shaft, protecting the latter.

What is claimed is—

1. A furnace conveyer assembly including in combination a shaft, a sheath, encircling the shaft, conveyer wheels or discs removably secured to the sheath for rotation therewith, and means extending between and engaging the sheath and shaft for maintaining the predetermined spacing of the shaft from the sheath.

2. A furnace conveyer assembly including in combination a shaft, a sheath encircling the shaft, conveyer wheels or discs secured to the sheath for rotation therewith, means extending between and engaging the sheath and shaft for maintaining the predetermined spacing of the shaft from the sheath and means for retaining heat insulating material within the sheath and about the shaft.

3. A furnace conveyer assembly including a shaft an axially elongated member encircling the shaft and having a cylindrical portion spaced apart from the shaft and provided with outwardly extending projections, a conveyer wheel or disc encircling said member and having inwardly extending projections on its inner surface, the outwardly and inwardly extending projections

cooperating when in assembled relation to prevent relative axial movement of the member and wheel, and means for locking the member and wheel in assembled position against relative circumferential movement.

4. A furnace conveyer assembly including a shaft a hollow axially elongated member encircling the shaft and having a cylindrical portion spaced apart from the shaft and provided with outwardly extending circumferentially spaced projections, a conveyer wheel or disc encircling the member and having inwardly extending circumferentially spaced projections adapted to pass axially between the projection on the said member and to cooperate therewith to prevent axial displacement of the member and wheel or disc from assembled position, and means cooperating with the projections of the member and the wheel or disc to prevent relative circumferential movement from the assembled position.

5. A furnace conveyer unit comprising a shaft adapted to extend through a furnace and to be supported at either end in bearings, a sheath disposed about the shaft, supported by the latter and adapted to extend across the interior of the furnace, article conveying annuluses encircling the sheath and engaging the latter at spaced circumferential points, the annuluses being secured against axial or circumferential displacement relative to the sheath, and means preventing relative rotational movement of the shaft and sheath.

6. A furnace conveyer assembly including in combination a shaft, a sheath encircling the shaft, conveyer wheels or discs secured to the sheath for rotation therewith and means including members remote from the ends of the sheath and extending between and engaging the sheath and shaft for maintaining a predetermined spacing of the shaft from the sheath.

OLIVER KARL CARPENTER.