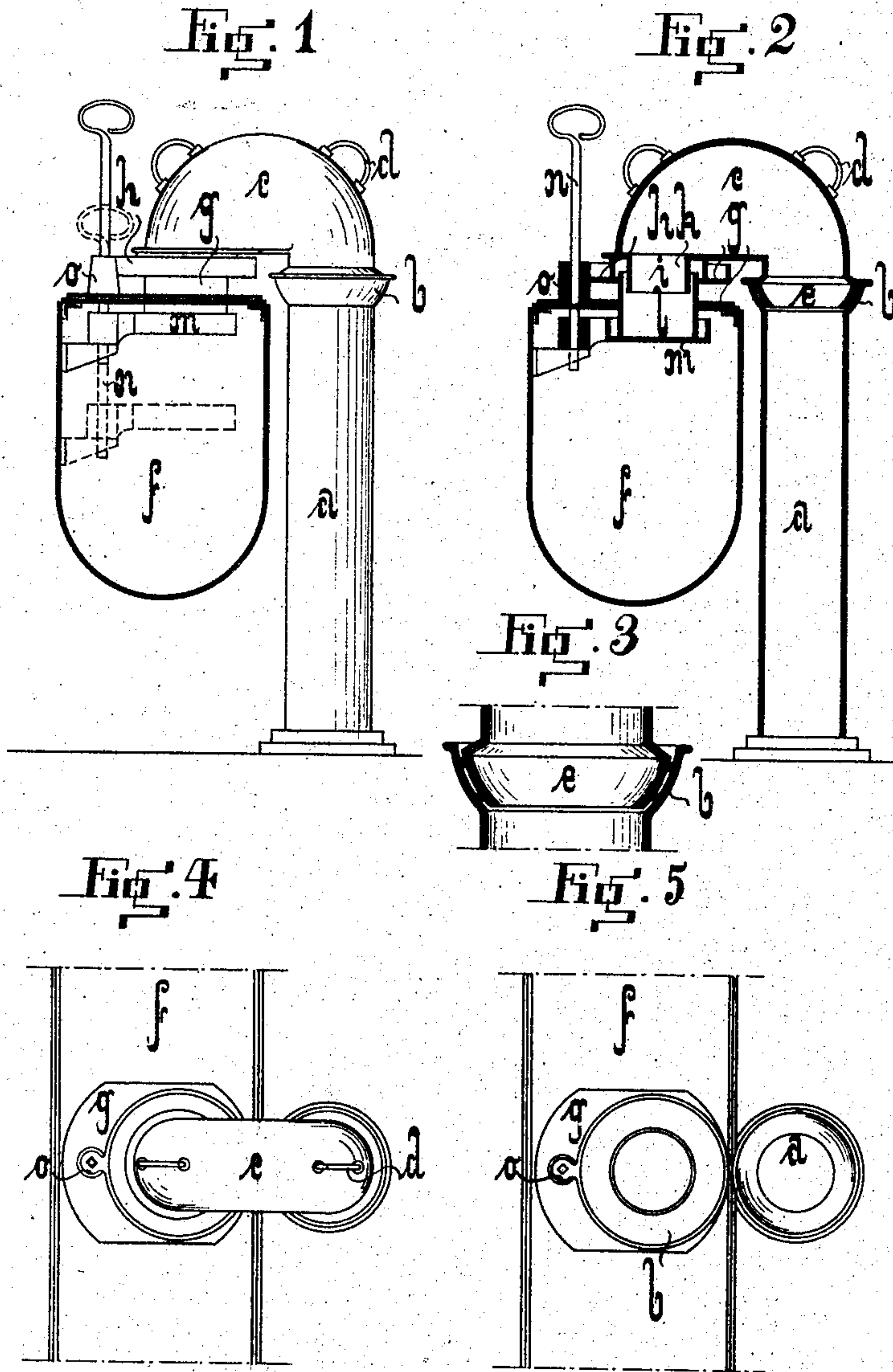


No. 781,213.

PATENTED JAN. 31, 1905.

H. KOPPERS.
COKE OVEN APPLIANCE.
APPLICATION FILED JULY 26, 1904.



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UNITED STATES PATENT OFFICE.

HEINRICH KOPPERS, OF ESSEN-ON-THE-RUHR, GERMANY.

COKE-OVEN APPLIANCE.

SPECIFICATION forming part of Letters Patent No. 781,213, dated January 31, 1905.

Application filed July 26, 1904. Serial No. 218,229.

To all whom it may concern:

Be it known that I, HEINRICH KOPPERS, a citizen of the German Empire, and a resident of Rellinghauserstrasse 40, Essen-on-the-Ruhr, Germany, have invented certain new and useful Improvements in Top Appliances to Coke-Ovens, of which the following is a specification.

My invention relates to a compensation-joint connecting the gas-main on top of a coking plant with the stand-pipe; and its object is to provide a communication between the said gas-main and stand-pipe in which certain disadvantages adhering to the devices hitherto in use are avoided. The rigid valve hitherto employed as such communication is very liable to break under the influence of heat or to become untight, and the elbow often employed, with a seal of fluid matter on each side, has the disadvantage that the tar hardens in the recesses, specially in those at the bottom of the stand-pipe, endeavors to remove the hard material resulting frequently in a breakage of the cups. Moreover, the absence of a closing device renders an inspection after removal of the connecting-elbow difficult. These disadvantages are obviated by the construction shown on the drawings herewith, in which—

Figure 1 is a full view of my device, and Fig. 2 a vertical section of the same. Fig. 3 is a detail view of the pipe-joint hereinafter mentioned. Fig. 4 is a plan view of my improved construction, and Fig. 5 the same view after removal of the elbow-tube hereinafter mentioned.

The stand-pipe *a*, through which the gases of the coal are to pass, is crowned by a cup-shaped seat *b*, suited to receive a spherical or round journal member *c*, which forms the foot of one end of a connecting elbow-tube *e*, supplied with handles or loops *d* to permit a lifting of the elbow by hand, and is made tight by a dry seal of grooves. The other end of the said elbow is provided with a water seal and is connected with the gas-main by a short tube *g*, which comprises a cup *h*, receiving an annular foot *i* of the said elbow *e*, which has a male tubular end *k* inserted in the opening of the said short tube, thus permitting a dripping of any fluid pitchy matter only beneath the said water seal. The said short tube *g*

has at its bottom a similar tubular end *l*, projecting into the gas-main *f*. The said tubular end may be closed by a basin or trough *m*, held by a rod *n* in a guide or passage *o*. The said trough may be given the position indicated in Fig. 1 by dotted lines to serve as a receiver of the fluid tar dripping from the aforesaid tubular ends *k* *l*, or it may be adjusted so as to assume the position shown in full lines in Figs. 1 and 2, and will in this case, together with the said tubular end *l*, act as a fluid-matter seal and at the same time shut off the gas-main *f* from the outside when the elbow *c* is lifted or turned aside. Now the hot gases passing through the stand-pipe *a* will cause an expansion of the latter, raising the elbow *c*, which finds its support in the short tube *g*, while the ball-and-socket-like arrangement of its other end permits a free rotary movement without impeding the tightening of the said stand-pipe against the outside nor its regular support. The gases coming through the stand-pipe pass through the elbow *e*, the tar carried along collecting mainly in the basin-receiver or trough *m* in the gas-main.

When it is desired to inspect the inside of the gas-main of an oven not in operation or remove the tar collecting in the aforesaid receiver, the latter will have to be given the position indicated by full lines in Figs. 1 and 2, which is done by means of the rod *n* in the guide *o* aforementioned. The elbow-tube may now be easily lifted and turned aside in the spherical joint without breakage of the cups or other injury. The receiver closes the gas-main tight against any influx from outside, and the tar may be easily dipped out.

Hitherto water was not used for sealing purposes in the gas-fittings on coke-ovens because it evaporates rapidly in high temperature and the customary construction of the seal on the stand-pipe was not proof against any dropping back into the oven of the products of condensation. Practice has shown, however, that by constantly replacing the evaporated water by new supply a permanent water seal may be easily retained, which has above all the advantage before other fluid seals, such as heavy oils hitherto much in vogue, that a hardening in the recesses is en-

tirely excluded. The condensation near the
 water seal of the admixtures floating in the
 very hot gases brought about by the escape
 of heat is by the above-described construction
 5 not only rendered inoffensive to the passage
 of the gases, but at the same time the said
 construction only makes the aforesaid basin
m under all circumstances an efficient closure.
 Thus there will always be present quite in-
 10 dependent of the temperature of the gases a
 quantity of fluid sufficient for sealing pur-
 poses, the cooling effects of the said water
 seal preventing a reëvaporation of the con-
 tents of the receiver *m*, which would occur in
 15 the absence of the said water seal. Only the
 quantity of water used for a permanent re-
 newal of the evaporated fluid varies, but can
 be easily regulated.

The stand-pipe being as above set forth
 20 supplied with a dry stuffing and the only liquid
 seal being provided beyond the turn of the
 gas-current brought about by the aforesaid
 elbow *c* a dropping back of the products of
 condensation into the oven cannot take place.
 25 The trifling admixture of steam with the gases
 is of no consequence.

Having now particularly described and as-
 certain the nature of my said invention and
 in what manner the same is to be performed,
 30 I declare that what I claim is—

1. The combination with the stand-pipe hav-
 ing the cup-shaped top member and the gas-
 main, of an elbow compensation-joint provided
 with loops or handles, one foot of the said el-
 35 bow terminating in a semispherical journal
 member resting in the cup-shaped top mem-
 ber of the said stand-pipe and having circular
 grooves and the other end of the elbow ter-

minating in a short tube and connected with
 and supported by the gas-main substantially 40
 as described.

2. The combination with the stand-pipe hav-
 ing the cup-shaped top member and the gas-
 main having a gas-inlet in shape of a short
 tube end with a water seal at its upper edge 45
 and with shut-off means at the lower edge, of
 an elbow compensation-joint provided with
 loops or handles, one foot of the said elbow
 terminating in a semispherical journal member
 resting in the cup-shaped top member of the 50
 said stand-pipe and having circular grooves
 and the other end of the elbow terminating in
 a tubular male end inserted into said tube end
 of the gas-main, substantially as described.

3. In combination, a stand-pipe having a 55
 cup-shaped top member, a gas-main having a
 gas-inlet in shape of a short tube end with a
 water seal at its upper edge, its lower edge
 freely projecting into the gas-main, a basin or
 trough receiver adjustable by means of a rod 60
 in a suitable guide adapted to seal said short
 tube at its lower end and an elbow compensa-
 tion-joint provided with loops or handles, one
 foot of the said elbow terminating in a semi-
 spherical journal member resting in the cup- 65
 shaped top member of the said stand-pipe and
 having circular grooves and the other end of
 the elbow terminating in a short tube and
 connected with and supported by the gas-main
 substantially as described. 70

In testimony whereof I have hereunto signed
 my name in the presence of two witnesses.

HEINRICH KOPPERS.

Witnesses:

PETER LIEBER,

WILLIAM ESSENWEIN.