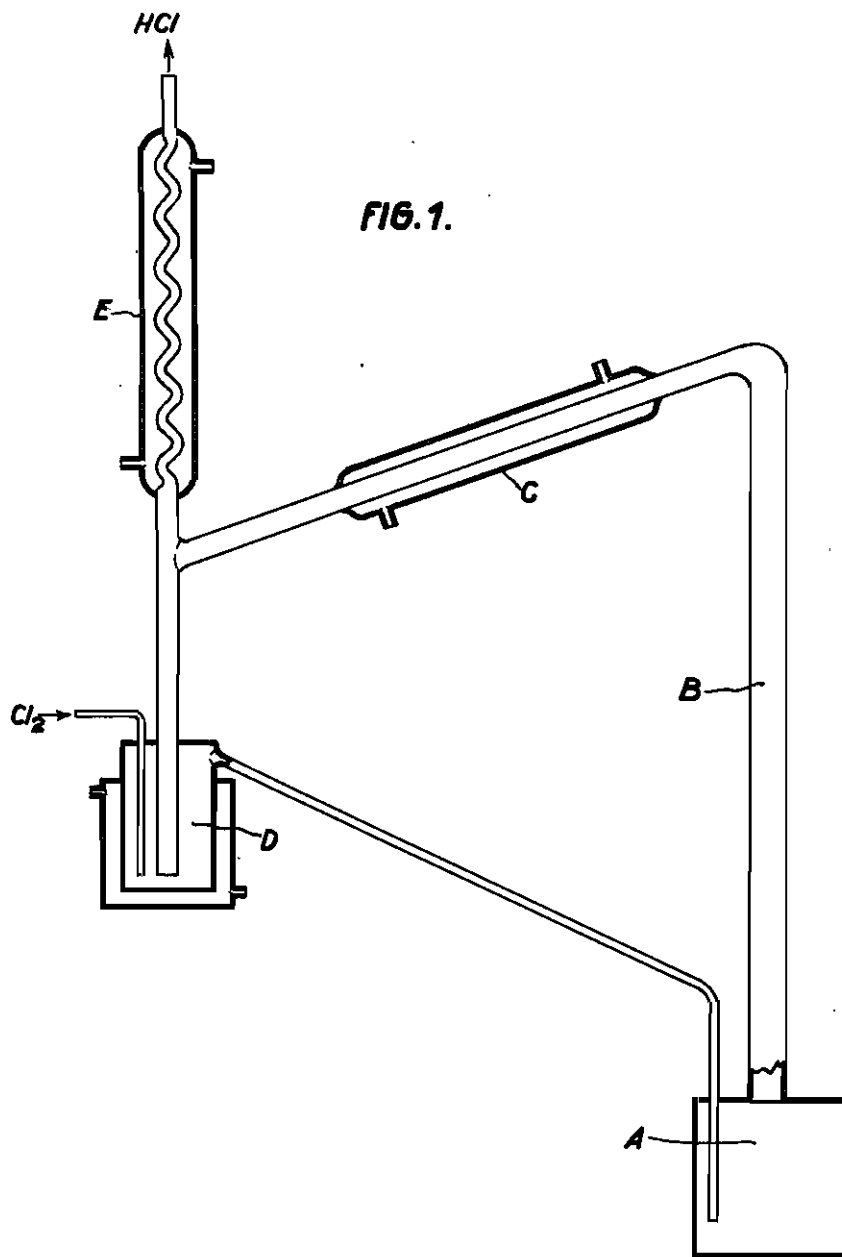


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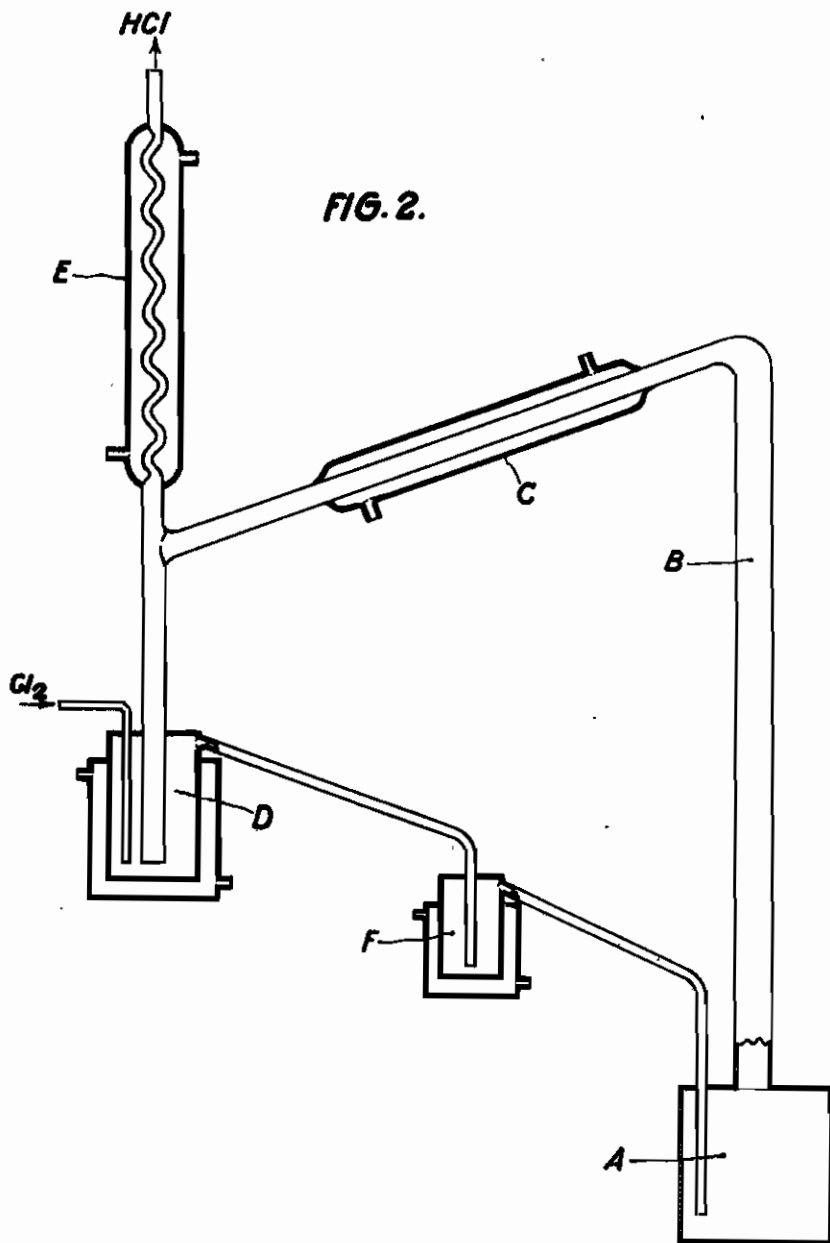


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ALIEN PROPERTY CUSTODIAN

CHLORINATION OF HYDROCARBONS

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Application filed October 28, 1941

The present invention relates to the chlorination of hydrocarbons in a continuous process.

It is known that on reacting chlorine and hydrocarbons mainly the respective monochlorides but at the same time also certain amounts of di- or polychlorides are formed the quantity of such higher chlorinated products increasing in proportion to the conversion of the initial hydrocarbons into monochlorides.

Wherever the maintenance of a certain lower chlorinated substitute is desired, such as monochloride alone, it has been possible to reduce the formation of higher chlorinated products to a large extent with the aid of well known modifications of the chlorination apparatus. These known modifications in the manufacture of chlorinated hydrocarbons by a continuous process, for instance in the production of monochlorides, work in such a way that the chlorine does not react directly with the total amount of the hydrocarbon to be chlorinated, but only with a divided portion of same. For this purpose the addition of chlorine is so adjusted as to yield only a small amount of monochlorides and accordingly a small amount of polychlorides. The reaction mixture is then drawn off into a still where it is separated by distillation through a fractionating column into chlorinated hydrocarbon and hydrocarbon. Whilst the chlorinated hydrocarbon gradually enriches in the still, the distilled hydrocarbon is continuously reconducted into the reaction chamber actually used for chlorination.

Fig. 1 illustrates an arrangement of apparatus according to the foregoing described principle for the manufacture of monochlorobenzene. At the outset the benzene to be treated rests in the still A whence it is distilled off over the fractionating column B into the condenser C where it is condensed and thereafter reacts with chlorine in the reaction chamber D. The chlorination gases escape through E. The chlorination product consisting of little chlorobenzene and much unchanged benzene flows continuously over an overflow back into the still A where it is separated into chlorobenzene enriching in said still, and into benzene which is reconducted into the reaction chamber over the fractionating col-

umn. It is known to effect the chlorination process in the reaction chamber D generally in the presence of a catalyst, such as $FeCl_3$ and under heat.

It has now been found that even under the foregoing conditions active chlorine will accompany the chlorination mixture on the return of the latter into still A where it encounters strongly enriched monochloride thus causing an unnecessarily large formation of higher chlorinated products.

According to the present invention it is possible to avoid this drawback by interposing a preferably heated sojourn zone F (Fig. 2) between the reaction chamber D and still A in which zone the active chlorine contained in the mixture returning from E is eliminated by full reaction with the hydrocarbon before reaching the still A. Said sojourn zone can have the form of an intermediate vessel, as shown in Fig. 2, but it may also be of a different suitable shape such as a coiled tube or the like. Any form of the sojourn zone is possible which leaves the reaction mixture sufficient time to eliminate the active chlorine contained therein by full reaction with the accompanying hydrocarbon.

The following quantities of active chlorine (in gram per litre) have been found in the reaction mixture flowing back into A.

Before entering the							
sojourn zone---	0,213	0,228	0,77	0,98	0,56	0,21	
After leaving the							
sojourn zone---	0	0	0	0	0	0	0

The process and apparatus described herein is used for the manufacture of monochlorobenzene, but it can also be advantageously employed both for the manufacture of any other monochlorides of hydrocarbons and for the manufacture of dichlorides or even higher chlorinated derivatives for the purpose of avoiding any further action of the active chlorine contained in the reaction mixture on the chlorinated derivative obtained.

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