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Forfatter:

Emnegruppe: Gaslevering

Tekst: Privat gasværk ved anstalten.

<http://museum-psyk.dk/admin%20htm-asp/Kasser/A%20011/0011%20HTM/011-0076.pdf>

Jeg har opmærksomhed på de forskellige de
 muligheder og omstændigheder angående Gæld og
 mig i de forskellige forhold, og nu drømt
 om det ved det resultat: at naar de forskellige
 forhold nu er som de er, så er der ingen af
 de Gældens muligheder, endda at de alle
 favorably opmærksomme, med hensyn til Gælden
 vil være, ville de alle sammen endda de nu de
 tydelig stærke forudsættelser for Gældens Løs-
 ning, endda at de alle Gælden være for sine
 værdier; i forbindelse med disse de materielle
 de i mædelysning og med de forskellige
 Gælden. Som mest sikkert. Til sidst
 nu er det de forskellige forholdene for
 mig som det er at den ikke bare mere
 skal om mig. Jeg tror, at at man
 ved det nu som det er for de Gælden
 som de er. - Indenfor det Gælden de vil
 sammenhæng i de forskellige forholdene sig nu har de alle
 de alle med de forskellige forholdene end den anden,
 nu de de forskellige forholdene med de forskellige forholdene af Gælden
 som, som den i forbindelse med de forskellige forholdene,
 Løsningerne nu: nu på de forskellige forholdene. Som
 man vil se som at de forskellige forholdene alle de
 og de nu vil se at de forskellige forholdene de de forskellige
 forholdene at de alle vil se de de forskellige forholdene
 sammenhæng på at den alle de forskellige forholdene

ad 29/1849

1. Per celand namng fad.
 2. fangr 500000 fangr 2.5. 81
 3. 500000 " " 2.5. 81

Þessi ágreiðing er um þann hátt að þú ert að gefa mér
 að fangið verði miðlaði af þessu fangri 1 miðlaði
 Lian þú ert að gefa mér þessu fangið 1 miðlaði
 Önnur ágreiðing er um þann hátt að þú ert að gefa mér
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Harminn 19 April 1861

(Signature)

med en Ladning Kuld, omkring 14 Døll af den Quantitet, som
med en lille tilføit under det almindelige Tryk. Qualitet bringes med
den Drining af Høien af Quantum Kuld lig Indfaldet af en fuld,
Stendig Gæs, iind i Retorten, forledes at nogle få Drininges med
nær istand tilføitelig at lunde Kopperens (Kulmodtagerens) Indfald.
Efter at denne Døgt er bleven i Retorten omkring 1 Time for,
nyes Døgten gæs sammen ellader som bestemm, forliden under
Eilføit med dring den forquænde form i Retorten. Den
følgende eller tredje Døgt efter Udlobet af en anden time dri,
er de to forquænde Døgter under vidre form, indtil den
fjerde Døgt efter Udlobet af 3 timer indviges af Retorten
Udgyndet, der deri noende første Døgt, som Gæsten er fuld,
kammer is indragen af. Den indkæmte Cokes, som faldt i Mad,
Lagran 15, og i Kapsorværet to Kinner du indtrages og findes at være
Længt bedre Cokes end de sædvanlige Gas Cokes, dette sære Cokes
med Cokes tilføies for første Døll for en vis Grad af Cøgt for
den itillende nu indkæstede med den første Cimes Opvarmning
i den smalle Ende af Retorten. Forinden at sulades Dø,
førende, da Retorten bliver fylde med en lille Quantum Kuld
for en time. — Det er indlysende at der end
denne Maffade, under Operationen at fylde og tomme Retorten
ikke kan sigges Gas bort, medens Quantiteten af Gas indvindes
af at give Quantum Brandstof og sære end det er opværet
med sædvanlige Maffade, for Dringens af Gæsen og af den første
Døgt, hvor altid gæs igennem ^{314 Døll} Retorten fulde Længde, og igjæ,
nær du opfæde Cokes af den Døll af Døgten som er Stendig
til at lunde i ellader, og en betydelig tid spæres, da Retort,
form er altid i Arbeide. Hjødsjæringerne, at der ingen
Mlange er med at fylde og tomme Retorten, og Luffden Inerced
en indlydig Kæper kan begjære Apparates gæs det efter en
lille Maffadok mal gæs til gæsret Bræg. Nær det uuse,
der efter en sære Maffadok kan Retortens forskjellige Høien dri,
med af ellader med Gasokkerne, som er en betydelig Bægerelse
i Jænderetende beriet, medens at sære Quantum Gas pro
duceres, og Cimes nu tabt under Udlobet af at fylde og tomme
Retorten vil blive spæret. Patentindhaveren for gæs

reviderede nu bagveden Maade at drive de 2 Klokker af et Par
Retorter. De to Klokker blev Dule af 1 Indretning i en Rød
og begge blev resp. Kruken, som dræner med en Omvendt Gang
gaa en horizontal Gang, som kan drive gaa udfra, som helst
bryden Maade enten med Dampmaskin eller anden Kraft.
Denne Oven gik ind i 2 Spiralfjæl, resp. gik ind i Kruken
Ogindlar. Denne Drivmaade kan antages, til at være af den
samlede af Retorten antret i 2 Rader i nogle Tilfælde kunde
bevil' eller Opremsok forbedret og anordnet i Retorten Oven og Oven
fjæl. Da den almindelige Opremsok af Gasfabrikationen
næsten Udtømmelse og Udflytning af Retorten flere Minutter
før 5^{te} eller 6^{te} Time, som den vil indrette Retorten for Atmosfæren
som for en gasfaldende Gældende Virkning, og forager Brandfærdig-
ning. I Tilfælde af det nøjagtig antagne Arrangement indgaa
at dette gaafta den Retorten næppe næsten ringe om Maaden
medens en Dampmaskin vil følge og tømme Retorten efter
en stor Maalestok, og gaa denne Maade meget betydeligt re-
ducere Arbeidsomkostningerne i Gasværket; medens et andet Maade,
tænkt altid koste 2 eller 3^{de} Gange mindre end andre Hvil vil
gaafta til dette System. Da Hullet faldt i Hovedet naar
de var indtrængende af Retorten, befæres ingen Arbejde for at
flække dem; og med en simpel Indretning kan alt indtræng
af alle Retorter i en Hvil hjælpe nu Gælden med Dampkraft
indtrængende at fjernes med Gælden og den vil staa. —
Retorten fylde før 6^{te} Time givte gaa forskyllige Stadier
for skyllige Qualiteter af Gas. I de første 3 Times og den
første med de sidste 3; medens den i den 6^{te} Time pro-
ducerede Gas for en meget ringe Betændingskraft, og i mange
Tilfælde forager i Quantitet, men aftages i Qualitet. Med
denne Drivmaade, følger før Retorten før den
med at lide Gælden Hvil, og Dampkraften før den alene at
gaa igennem hele Lengden af den gældende Retort, men optæn
igennem at betydeligt Quantitet nærmest Brandfærdig, som vil
med at blive indtrængende; gaa denne Maade blive først Dampkraft,
som gaa den forordnede Maade vilde forskyllt, — da denne Tjere — i
at betydeligt Omfang forordnede, til en permanent Gas, som vil staa

I den 11. December 1844 blev der foretaget en prøve på den nye Retort, som vil staa i et af Gasværket i Helsingørskommune.

(Indes en Kædetank med alle de her til hørende) F. Hørmann, miltst "S. m. f." at Hørmann for dem med at bygge sig 2.

eller en lille Møalestok uanfældende i det første Trækning og niferde, Kædet
Kædet F, som i sin Jordbæret, af Opfindelsen. Fig 2 er en Section af Kædet
Kædet, niferde dens indvendige Indretning og Opstillingen med, som ogsaa
den gennemviede Kammeroplysningens og Kammerens, Med A er Kædet
som forsynes med Brændstoft, igjennem Fælle B og for Kædet
denne end, er omgivet af Enghæmmeret og indfoldes Kædet D,
som gaar over og forigjævel eller næsten færdig, derigjennem over
Kædet. En Bør af Kædet, er bygget ind i Kædet, og for Kædet
aendres i de tilfældige Dale af Bør for at Kædet og Kædet
kan gøres igjennem. Denne Kædet er fast da den er aendret i
Enghæmmeret, og bliver smalt og smalt, da den er aendret i den
Ende for et mindre Diameter end den anden Ende. Med den smalle
en Ende er Kædet eller "the hopper" E aendret, som med dens
overste Ende eller enden, er lukket med en Prop G, lige i den
Dokkel. En anden Kædet F er aendret i en ret Winkel eller næsten
færdig til Kædet eller "the hopper", og under færdig færdig,
at naar der kommer Kædet i Kædet, det da færdig for Kædet. Med
et middelt Kædet en anden Kædet, med Kædet, som
skal være meget mindre med F Kædet "pitch" bliv færdig eller
færdig ind i Kædet. Denne Kædet Kædet kan tilværelse
for færdig en færdig I, og i Kædet i som vist for
Kædet; eller en Kædet, eller næsten anden Kædet, "prime
movee" kan aendres, at den Kædet med Kraft, eller Apparatet
Kædet, som ligeledes gælder kan aendres til privat Brug eller en lille
Kædet, som til offentlig Brug eller en stor Kædet. Utvænlig,
Kædet af Kædet, som er gjort brøden for Kædet af Kædet
ind i Kædet og at lette Kædet af Kædet, aendres sig
ind i Kædet Kædet. Et mindre Kædet er aendret og gælder
med i Kædet eller Kædet I for færdig at aendres
Kædet og færdig. Et mindre Kædet eller Kædet er aendret for
Kædet for at lette Kædet, af Kædet. Med N er Kædet
funktioner, som færdig til Kædet, O af det "Comp Apparat" P
Kædet i et Kædet Kammer og Kammer.
Den indledte færdig O færdig det aendres Gas fra Apparatet I til
en almindelig eller anden Kædet R. - Naar Kædet
skal arbejde færdig Grundryggen G færdig F færdig, da

Kommer lig en Destillation af Tjære, og da der af næsten
Gallon Tjære kan produceres 100 Cbfs Gas, som følger deraf at
udført System, som vil formindre dets Production vil forøge
Gænsen - og dets Systemets Hoved. Dette er nu Grund til for-
øget Production, en anden er, at der ingen Tub forankommes, men
dens Retorten fyldes med Kull og Loken beskyttes, som i
mange Tilfælde indgiver at betydelig Procent gaa det bearbejdede
Produktum; dertil kommer endnu den Hjælpesjæring, at der
ingen Gasfabrikere under disse Operationer, påklædes, at det
er let at miste, at, med de combinerede Apparater af den
nye Proces, nemlig: 1) i Quantitet, med den almindelige
Destillationsmaade, som end Gænsen, istandføres at fastgøres
til Tjære, som endes til en permanent Gas; og 2) med Apparater
af det, som gaa den betydelige Mængde tabes under Operationen at
fylde og lømme Retorten; og 3) med Apparater i Tid, da Retorten
altid skaars stille, som hidnævnte nu mere tilfældet med den
nævnte. Mængde - en Løstjæl af italmindst 15% i Quanti-
tet kan produceres mere, end hvad der kan opnåes ved Retortens
Færdighed, som de nu arbejder. Disse Lovene, forvandle med den
nye Apparatur, som kan bevirkes; Arbejde, vil usædvanlig
bidrage til at gøre Gænsen billigere og forøge Udbyttet.

En af de største Ulemper, som Gasfabrikanten får at bemærke
er den unyttige Udførelse af Lokes. Som da for Tiden pro-
duceres, gøres da ikke til fordelagtige Operationer og Bujer
for at hvidebring er langt fra ikke lig Productionen, påklædes
at Gascokes er bleven en dærlig Markedsvarighed, som dærlig
at da i mange af de store Værker i London kunne kjøbes for
en nominal Sum, da Manuskripten at faa Plads til den
er som for. Denne Mængde faar man, med dette Gascompa-
nier istand til, at stille sig med disse Lokes til Compende forløber
for med Udførelseforvarende indgået Hællever nu Plads
Sammenligning leverer end i en Time under Lokes pro-
cessen og det nævnte Repertat er Lokes, som man langt det
hæver med de almindelige Gascokes, påklædes at de kunne købes
for i Næsten i mange Jærstæder. Hvad sidst til er bleven #

Jægt medkommene atter Fabrikationen af Gas efter at først
 etlaad, naar Kraften er tilstrækkelig med Damp og Arbejde for
 medfælgende indførsel med Maskiner, men der er meget andet at
 overveje nemlig Løsningen af det nævnte Problem at fabricere
 Løst Gas i det Indre for grønt Brød. Tidligere som
 Landstøtjener i denne Række indskrænktes sig til Olie,
 olivastige - og salet Hvidtøffer, men alle disse var mislykkede,
 paa Grund af det producerende Materielets høje Pris. Høje
 olien som almindelig anvendes, koster nemlig 9^o p. Gallon og
 i Praxis kører Løst ca 90 Ft Gas indvundet af en Gallon, saa
 at der er en Udgift af omtrent 8/6 p. 1000 Ckts, for det
 saae Materiale alene. Derved kommer Brødet, Løst
 og andre Omk, som bringer Kosten paa Gas, naar der foretages
 fra 20 til 30 Galloner omtrent til en Løst af 14^o p. 1000
 Ckts, og Lyftkraften er der ikke større end den som opnåes
 af almindelig Hvidtøffer. De gamle Hvidtøffer af et grønt Olie
 som vedvarende koster, er de bedste til dette (Apparat);
 og alt som er foretaget, er at der er nu fået gjort en
 god Erindring, som både fylder og tømmer Kisten som sædvanlig
 og som er mere en Minut, saa at, praktisk kalder den
 hvidtøfferingen, som i gamle Tider, konstruerede efter den
 almindelige Plan er meget god og findes i mange
 Løst Løst som fører paa den almindelige indvundet til Løst
 (Med dette (Apparat) fabriceres Løst 1000 Ckts af Løst som
 Løst: Løst = Hvidtøffer; men for at give en omfattet af Gas.
 Løst Pris taget af mange Maanedes praktisk Arbejde
 med Omk, som fylder, for at Apparat, til 20 Løst:

1 Cwt Løst Hvidtøffer producerer nemlig et Minimum af 500
 Ckts Gas Udgift for Hvidtøffer 0 10^o
 Løst, som bliv til Løst, forinden de producerer af
 Apparat, for at opføre Kisten 0 - 6 -
 Arbejde nemlig 2 Timer for Dag af Damp 0 - 4 -
 Transport 1 sh 8^o

Transport	1 sh 8 ^c
Slitage	0 - 2 -
Rente af Kapitalen & Dag	0 - 2 -
Total Sum p. 500 f. 2 sh -	

Jeg ser at i vunder Gal, inden at fradraget Tjeren og andre
 Luftprodukt, Gaspen 4 Re p. 1000 Cubft for kun 20 Dags
 bruges. Dette vil naturlig blive uafgjort udmærket i de store
 Company og i nogle Localiteter vil Kullet og Coles ikke koste
 for meget. Men det synes at 50 Dags Apparat vil det produere
 cirka 100 mange Coles, som vilde være udfordrende til at
 sælges p. 1000 Cubft, og Gasprisen vil ikke blive lavere end
 3 Re p. 1000 Cubft. Thi naar nyelig lavet meget om
 Gasmonopolen, naar den vigtige Maade at tilintetgjøre
 det er at producere en bedre og billigere Artikel end den
 der er i Besiddelse af Monopolen. Ingen kan undvære
 dette og andre praktiske Forbedringer som W. Bower
 har lagt Planen til, og gjenmaafset med Hensyn til hans
 Opfindelse og Fabrikationen af Gas, inden at man
 overbeviser om, at man er mere af dem, som har arbejdet faardt
 for at meddele mere store industrielle Lister og Befand-
 lingsmaade og vistelig videnskabelig Lære, og som taalder
 borte for det Arbejdet og forjæm det produktive Kæft.

1 Gas Apparat p. 1 for 15 Hysmer	2000	og Koster	400 Rddr
1 do do " 2 " 30 " " "	4000	" "	550 "
1 do do " 3 " 45 " " "	5500	" "	700 "
1 do do " 4 " 60 " " "	7000	" "	850 "
1 do do " 5 " 80 " " "	8000	" "	1000 "
1 do do " 6 " 100 " " "	10000	" "	1200 "

For at amhave. Hvilke andre Apparater er der brug for, Tals om det
 er at sætte Apparater i og der er et stort antal af dem, de Bower
 finder om dem til at sætte Apparater og bringe det p. det nye Gang

Book of Mary's Abolition of the
21st June 1860

John F. Spahr

J.F.

John F. Spahr
Superior

Superior

PATENTEE.

Fig. 1.

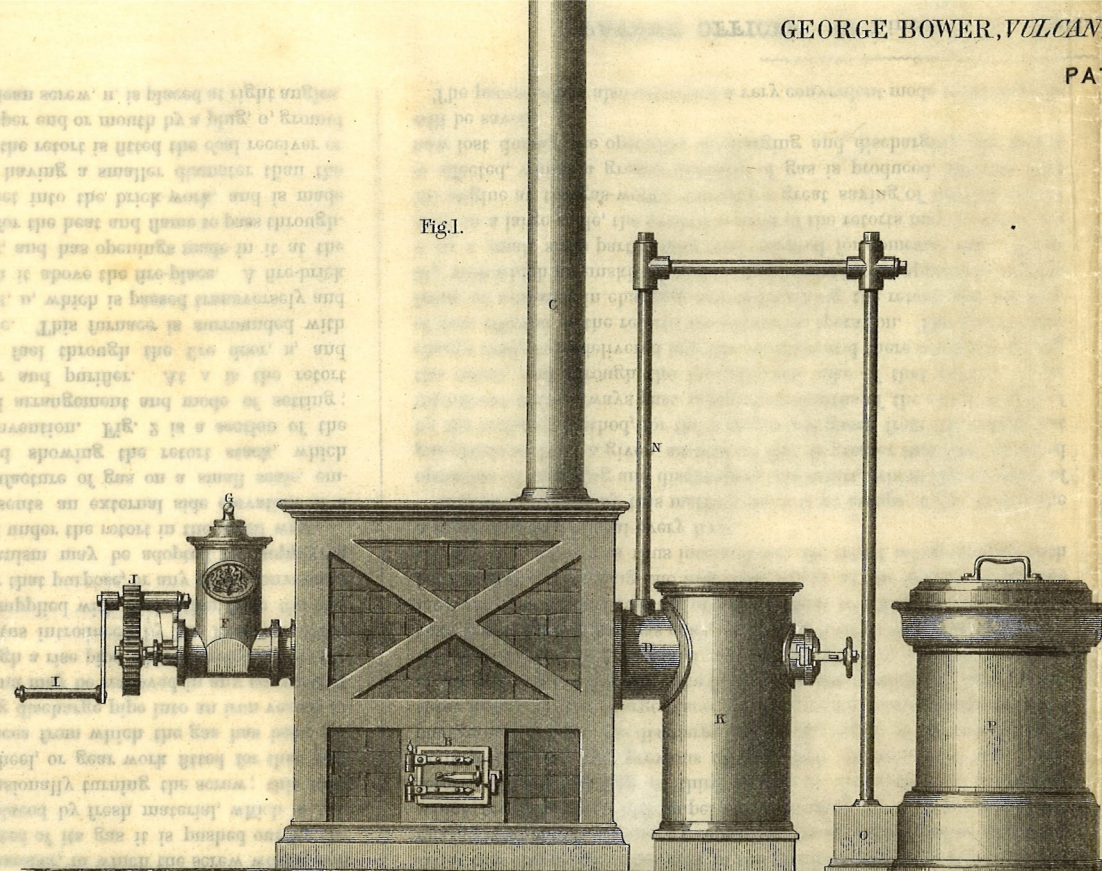
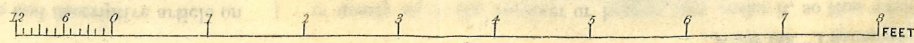
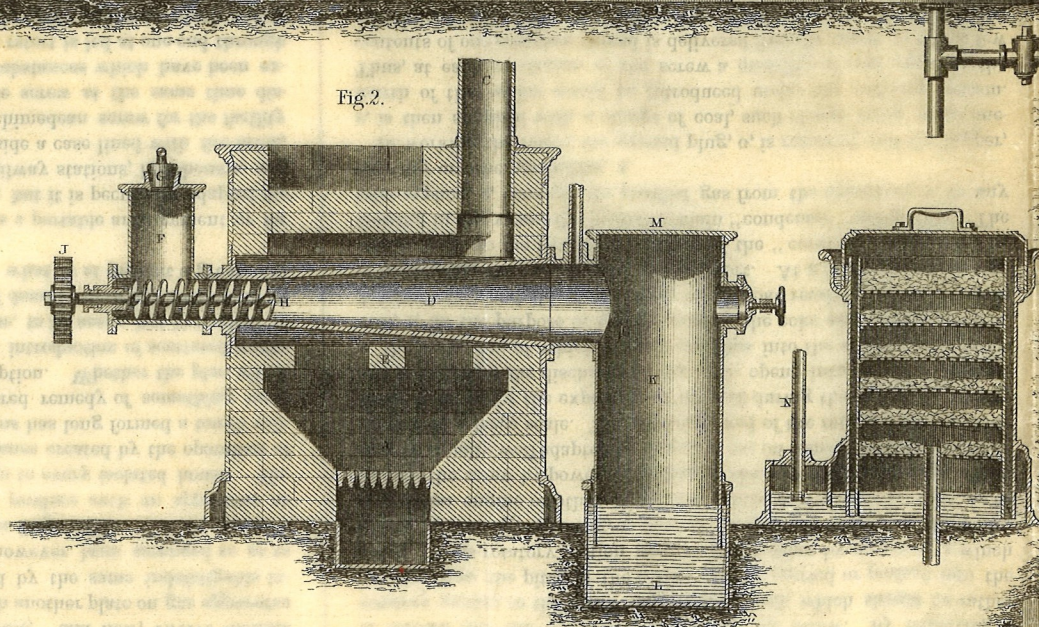


Fig. 2.



This is a copy of the original drawing of the engine and boiler system, showing the various parts and their connections. The drawing is a technical illustration of a steam engine and boiler system, showing the boiler, engine, and various pipes and valves. The drawing is a perspective view of the engine and boiler system, showing the boiler, engine, and various pipes and valves. The drawing is a perspective view of the engine and boiler system, showing the boiler, engine, and various pipes and valves.

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On the first of January, 1857, we gave a plate and descriptive article on "Gas Light Economical on a Small Scale," and now, twelve months later, we present our readers of 1858 with another plate on gas apparatus economical on a small scale, originated by the same indefatigable inventor. This latter contrivance has, however, been arranged so as to be capable of working equally well on the large scale. But Mr. Bower's especial object has, all along, been to produce such an apparatus as should be fitted to serve as an appendage to every isolated house. The question of putting down the great nuisance created by the operation of extensive gas works in the midst of towns has long formed a tough subject for discussion, and here is an offered remedy of something more than fair pretensions to notice and adoption. Whether the plan which we now submit will lead to the practical introduction of scattered works on the moderate scale, remains, of course, to be seen; but it is clear to us that sooner or later the inhabitants of densely crowded districts must look to some such means of relief from what is at present a great city evil.

This gas apparatus is suitable either as a portable arrangement or for the manufacture of gas on a large scale; but it is peculiarly adapted for supplying private houses, workshops, railway stations, lighthouses, and ships, and consists of a retort placed inside a case lined with fire-brick, such retort being furnished with an Archimedean screw for the facility of supplying it with fresh material, the screw at the same time discharging the coke or other carbonised substances which have been exhausted of their gas. Each charge of the retort is led at one end through a vertical pipe having a flange fixed on its upper end, into which a plug is fitted; this pipe opens into a chamber, in which the screw works, and as fast as the material is exhausted of its gas it is pushed out by the screw at the opposite end and replaced by fresh material, which is traversed through the retort by occasionally turning the screw; this may be done by a winch handle, fly-wheel, or gear work fitted for that purpose. The coke or other substances from which the gas has been exhausted falls through a descending discharge pipe into an iron vessel, or a reservoir of water, if required, and may be removed in any convenient manner. The gas passes up through a rise pipe which conducts it to the condensing and purifying apparatus introduced by Mr. Bower in 1852. The fire for heating the retort is supplied with fuel either from the top, through a suitable mouthpiece for that purpose, or any other convenient arrangement of self-feeding mechanism may be adopted for supplying fuel thereto, or it may be supplied under the retort in the usual way.

Fig. 1 on our plate 219 represents an external side elevation of a complete apparatus for the manufacture of gas on a small scale, embracing these improvements, and showing the retort stack, which forms the main feature of the invention. Fig. 2 is a section of the retort stack, showing its internal arrangement and mode of setting; as also the combined condenser and purifier. At *a* is the retort furnace, which is supplied with fuel through the fire door, *b*, and fitted with a metal chimney at *c*. This furnace is surrounded with brick-work, and contains the retort, *d*, which is passed transversely and horizontally, or nearly so, through it above the fire-place. A fire-brick arch, *e*, is built beneath the retort, and has openings made in it at the haunches or springing of the arch for the heat and flame to pass through. This retort is stationary, being set into the brick-work, and is made slightly tapered, the feeding end having a smaller diameter than the other end. At the smaller end of the retort is fitted the coal receiver or hopper, *f*, which is closed at its upper end or mouth by a plug, *g*, ground right into its socket. An Archimedean screw, *h*, is placed at right angles,

or nearly so, to the receiver or hopper, and under it, so that when coal is thrown into the receiver it falls upon the screw. By imparting a rotatory motion to the screw the pieces of coal, which should be rather smaller than the pitch of the screw, will be carried or pushed into the retort. This rotatory motion may be given either by means of a winch handle, *i*, and spur gearing, *j*, worked by hand, as shown in the plate; or a steam engine or other convenient prime mover may be used, so as to turn the screw by power, according to the size of the apparatus, which may be equally well adapted for domestic use on a small scale as for public service on a large scale. The discharge end of the retort, which is made wider to allow for the expansion of the coal during the process of coking, and to facilitate the discharge of the coke, opens into the coke receiver, *k*, the lower end of which is open and dips into the water pan or reservoir, *l*, for the purpose of rapidly cooling the coke and sealing the gas. A mouthpiece and lid, *m*, are fitted to the coke receiver, for the purpose of facilitating the examination of the retort. At *n* is the ascension pipe which leads to the hydraulic main, *o*, of the "combined apparatus," *p*, forming in one vessel the hydraulic main "condenser" and purifier. The inlet syphon, *q*, conveys the purified gas from the apparatus, *p*, to any ordinary or other gasholder, *r*.

In working the retort, the ground plug, *g*, is removed, and the hopper, *f*, is then supplied with a charge of coal, such charge being about one-fourth of that which would be introduced under the ordinary system. Thus, at each revolution of the screw a quantity of coal equal to the contents of one complete thread is delivered into the retort, so that a few revolutions will suffice to deliver the whole contents of the hopper. After this charge has remained in the retort for about an hour, another charge is supplied thereto by repeating the operation before described, which second charge will impel the preceding one forward along the retort. The succeeding or third charge at the expiration of another hour pushes the two previous charges still further, until the fourth charge expels from the discharge end of the retort at the expiration of three hours the first charge placed therein, which is completely extracted of its gas. The discharge coke falling into the receiver, *k*, and into the reservoir, *l*, can be then raked out, and is found to be a much better coke than the ordinary gas coke, such superiority being due in a great measure to a certain amount of compression to which the coal is subjected when undergoing the first hour's heat at the smaller end of the retort. The process is thus intermittent, the retort being charged with a small quantity of coal every hour.

It is obvious that by this method there is no escape of gas during the operation of charging and discharging the retort, whilst the quantity of gas obtained from a given amount of fuel is greater than that obtained by the ordinary method, for the vapours and gases from the charge last introduced must always pass along three-fourths of the entire length of the retort, and through the incandescent coke of that portion of the charge ready to be delivered into the receiver, and there is a great saving of time effected as the retorts are always in operation. The fact of there being no nuisance in charging and discharging the retort, and the facility with which an unskilled person may attend to the apparatus, renders it on a small scale particularly well adapted for domestic use. When used on a large scale, the several screws of the retorts may be driven by the engine at the gas-works, whereby a great saving of manual labour is effected, whilst a greater quantity of gas is produced, and the time now lost during the operation of charging and discharging the retorts will be saved.

The patentee has also contrived a very convenient mode of driving the

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two screws of a pair of retorts. The two retorts are part of a setting in one bench, and both of their respective screws are actuated by means of a worm, on a horizontal shaft, which may be driven in any convenient manner by a steam engine or other power. This worm gears into two worm wheels, respectively keyed on to the spindles of the screws. This mode of driving may be adopted for feeding any number of retorts set in two tiers. In some cases bevil or spur gearing might be advantageously employed in place of worms and worm wheels.

In the ordinary practice of the gas manufacture the drawing and charging of a retort occupies several minutes every five or six hours, besides exposing the retort to the atmosphere, which has a sensible cooling effect, and increases the fuel account. In the case of the arrangements just considered, it is all avoided, as the retort is hardly opened once in a month; whilst a steam engine will charge and discharge the retorts on the larger scale, thus very materially reducing the labour account in gas works; whilst the nut coal, which always costs 2s. or 3s. per ton less than other coal, is the best adapted for this system.

The coke falling into water when it is expelled from the retort does not require any labour to quench it; and, by a simple arrangement, the whole of it expelled from all the retorts in one stack may be drawn into a vault by power, instead of being removed by manual labour as at present.

Retorts charged every six hours give, at different stages, different qualities of gas. During the first three hours it is richer than it is during the last three; whilst the gas produced at the sixth hour is of very feeble illuminating power, and in many cases increases in quantity, but deteriorates in quality. By this process, each retort is charged every hour with a small quantity of coal, and the vapours have not only to pass over the whole length of the red-hot retort, but also through a considerable amount of incandescent fuel which is about being expelled; thus those vapours which, in the ordinary way, would be condensed—forming tar—are, to a considerable extent, converted into a permanent gas, which is almost equal to a distillation of tar; and as from every gallon of tar there may be produced 100 cubic feet of gas, it follows that any system which will lessen its production will increase that of gas—hence the value of the system. This is one cause of increased production; another is, that there is no loss during the charging with coal and drawing the coke out of the retort, which in many cases amounts to a serious percentage upon the amount worked; added to which is the fact that, during these operations, no gas is being made, so that it is easy to see that by the combined savings of the new process—namely, first, in quantity, by the peculiar method of distillation by which the vapours, instead of being condensed into tar, are converted into a permanent gas; and second, by the saving of that which escapes in ordinary practice during the operation of charging and discharging the retort; and third, by the saving in time, the retort never being out of work, as necessarily must be the case by the present method—a difference of at least fifteen per cent. in quantity may be produced over and above that obtainable by the retorts as now worked. These advantages, added to the enormous saving to be effected in labour, will materially assist in cheapening gas and increasing dividends.

One of the greatest drawbacks with which the gas manufacturer has to contend is the useless accumulation of coke. As at present made, it is not fit for metallurgical operations, and the demand for culinary purposes is not nearly equal to the production, so that gas-coke has become a drug in the market—so much so, that in many of the large works in London it may be had for a nominal sum, as the difficulty of storage

is so great. This method, it is expected, will enable gas companies to get rid of their coke at remunerative prices; for by the process of charging, the coal undergoes a species of compression for upwards of an hour during the process of coking, and the resultant product is a coke denser by far than ordinary gas-coke, so that it may be used in foundries for many purposes.

What has been said hitherto relates entirely to the manufacture of gas on a large scale, where the power is obtained by steam and the labour performed mainly by an engine; but there is something else to be considered, and that is the solution of the difficult problem of the manufacture of coal gas on a small scale for private use. Hitherto the principal attempts in this way have been confined to oil or oleaginous and solid carbonaceous matters; but all these have signally failed, on account of the great expense of the gas-producing material. Resin oil, which is generally used, costs say 9d. per gallon, and in practice only about 90 feet of gas can be obtained from one gallon of it; so that here is a cost of about 8s. 6d. per 1,000 cubic feet for the raw material alone. Then there is the fuel, and the wear and tear, and other expenses, which make up the cost of the gas, where from twenty to thirty lights are required, to something like 14s. per 1,000 cubic feet, and the illuminating power is not greater than that obtained from an ordinary candle. The small coal of a private establishment, which is generally wasted, is the best adapted for this apparatus; and all that is required is simply to turn a handle once every hour, which both charges and discharges the retort at the same time, and only occupies a minute, so that, practically speaking, the labour account, which, in small works constructed on the ordinary plan, is very great and objectionable, and the nuisance more so, is thus reduced to nothing. By it fully 11,000 cubic feet are made from each ton of Newcastle small coal; but to give an illustration of the cost of the gas, deduced from practical working for many months, the cost stands thus for a twenty-light apparatus:—

One cwt. small coal produces say a minimum of 500	<i>s. d.</i>
cubic feet of gas, cost of coal,.....	0 10
Coke over and above that produced by the apparatus for heating the retort,.....	0 6
Labour, say two hours each day of a youth,.....	0 4
Wear and tear,.....	0 2
Interest of capital per day,.....	0 2
<hr/>	<hr/>
Total cost of 500 feet,.....	2 0

So that, in round numbers, without deducting the tar and other residuary products, the gas costs 4s. per 1,000 cubic feet where only twenty lights are used. Of course this will be materially reduced in the large sizes, and in some localities the coal and the coke will not cost so much. If a fifty-light apparatus be taken, there will be as much coke produced as will keep the fire going, and the cost of the gas will not exceed 3s. per 1,000 feet.

We have latterly heard much of gas monopolies; but the true way to bring them down is to produce an article better and cheaper than he who is in possession of the monopoly. No one can examine this and other practical improvements which Mr. Bower has suggested and carried out in relation to his favourite pursuit—the manufacture of gas—without being convinced that he is one of those who have laboured hard to impart a really scientific form to the processes of our great industrial arts, and who thus at once dignify labour, and heighten its productive powers.

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