Past long by 16 feet in dismeter，working to a pressure of 70 lbs．pgr square inch，and supplied by Mesars．Lsea，An－ derson \＆Cs，Ciyde strest，A aderston ：the pair of fine en－ giaes by which the machiaery is driven have also been sup． plied by the same firm，and are diagonal compound high pressare，both high and low pressure cylinders working on the same crank pin．The high pressure cylinder is 16 inches in diameter，that of the low pressure cylinder being 24 inch－ es，and leggth of stroke 30 inches．In the former there is an expansion valve so arranged as to cut off the stroke at any point，from 5 inches to $2^{\prime} J$ inches，and which can be va－ ried at will while the engines are working at full speed． They are regulated by Scott＇s Moncrieff patent governor． There will also bo a small engine for the hoisting machinery in the graill store，and warking separately．The architect of
the building is Mr．W．Spence；while Mr．W．Young，Hour mill engineer，has conetructed and superintended the erec－ tion of all the varied and complicated mechanism of store and mill，with the exasption of the engines，boilers，and milldtones．Mr．Young＇s new cooler has been adopted here for the first time．

## Frinutifir gimmian．

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## the light of coming days．

The light of otber days－practical，not poetic－was the tallow dip，and，fur：her back，a bunch of moss in a dish of grease．The ad vanca from this primitive illuminator to the gas $j$ at covers a moat important atage in the progress of do bute fist $f$ mas a buregarded as ther of night．But it falla very far short of it．
B $\rightarrow$ fore we can truly say that our streets and houses ar lighted ecientifically，another and more important advance must be made．We must gat rid of the offensive and poi－ sonous products，the heat and flickering，the sharp contrasts of light and abade，the needless expense and frequent fires，
and the theusanjother disadvantares attendiog the distri bution and locil combustion of our illuminating material，by distributiog intead pure light．
Tae probl：m is riaple and easily solved．Wbat we wan in our romo is a cl－an，white light，ilk diffused daylight． The popular mistake lies in rupposing that the light must necessarily be generated where it is used．The remoteness of such a position．

Every tyro in optica knows that light is the most tractable of material effects．It is obedient to the last degree．You can send it where you will，to any distance，through the crookedest cbannels，through the darkest passages，and it
will emerge undimmed，ready to be absorbed or dispersed as will emerge undimmed，
the operator may wish．
It is well known also that there are many ways of produc ing a brilliant light，much more easily and economically than by carbon combuation in small and scattered flames．Yat curiously，this familiar knowledge does not appear to have ever been put to practical use in producing a simple，whole buildings．To scientificillumination for publ andle snuf fers are unknown，or known only as relics of an antiquated system of domestic economy．It is possible that，to their children，gas pipes may be equally obsolete as articles of children，gas pipes may be equally obsolete as articles of
bousebold use，light tubes furnished with reflectors and ter－ minal radiators taking their place．
The working of the predicted system can be sketched in few words．Given，say，a large hotel to be furnished with artificial light：Instead of having a network of gas pipes leading to the different rooms and to different burners in each room，according to the present method，the light for the cntire building would be generatedin one place，say in the main ventilating shaft for the utilizing of the surplus heat． The distribution of the light would be effected by means of reflectors，each throwing into its appropriate tube a bun－ dle of rays（made parallel by a lens）sufficiently intense to flood the room to which they were directed with a pure white radiance，which could be turned on or off or graduated by sim ply preseing a knob or turning a key．In size，the light tubes need be no greater than ordinary gas pipes．Indeed they might be much amalier，since all the light required for the larges room might be transmitted to the reflector as an extremely
slender beam．The terminal lenses would close the tub slender beam．The terminal lenses would close the tube
sgainst smoke and dust，which would dim the reflectors at the angles；and by keeping the enclosed air pure and dry，the absorption of light would be inappreciable．
Tae advantages of this mode of illumination are many and obvious．There would be no poisoning of the a mosphere by local combustion ；no scattered flames to occasion fires；no cir culation of combustible material $t$ o encourage fire，should it bappen to break out；children and careless servants would have nothing to handle that could possibly do damage；there would be no misplaced heat；no smoke or odor to sicken or annoy；no crose lights or flickerings to hurt the eyes．Be sides，the lighting of a bouse would help to purify its atmos phere，instesd of vitiating it as now，if the source of igh and placed，as we have suggested，in the vont hag shat and，very likely，the economy of the light would be such that
means for the instantaneous illumination of the entire bouse means for the instantaneous illumination of the entire bouse
could be maintained at all hours of the night without costing more than our preaentimperfect and partial lightiny doos．
For churches，theasers，and other places of public resors， this method of lightiv＇s is specially available and inviting The source of light might be in an absolutely fireproof vault or chamber，or in a separate building，so that the danger of to the minimum．Similar advantages would attend its ap plication to sbipping．For mines，erpecially coal mines，it is unapproacbable for simplicity and safety．Smoky torches and tor he shadow of a risk of explosion．

## A CHANCE FOR INVENTORS．

While there is reason to doubt the possibility of devising an electric motor capable of doing heavy work as economi cally as the steam engine，there can be no question that，for light service，a satisfactory electric engine is one of the most widely falt needs of the age．
All that is lacking to meet this want is a suitable battery in other words，a simple，compact，portable；and，if possible dry apparatus，capable of generating a steady current of elec tricity for a considerable period without renewal，capable of slanding unused without material waste，yet able to give ou its full power on the instant when required，capable of bein easily and cheaply kept in working order，free from fumes， and not liable to leak or spill its contents underordinary cir cumstances
The applications which a wait such a battery are practically innumerable
Even with the fuming，slopping，troublesome batteries already in use，enough has been accomplished with electric motors to demonstrate the superiority of electricity for light work．Ererything that steam can do in such cases it can do and there are many occasions，domestic and otherwise，where steam power cannot be conveniently employed，where a smal electric engine might do the required work quickly，neatly， without heat or risk of explosion，and without calling fo special engineering skill or knowledge，the common lack of which must ever act as a bar to the general employment of eteam for household service．And though the power ob tained may be，in itself，many times more expensive than an equivalent amcunt of steam power，the ad vantages attend
ing the use of electricity are so pronounced the ing the use of electricity are so pronounced，the possible
saving of time and trouble so great，that，with a generator saving of time and trouble so great，that，with a generator
puch as we have described，there would be no hesitation in auch as we have described，there would be no hesitation in
giving it the preference in thousands of cases where a little Fower is wanted for continuous work，or where there is occasional need of a small but instant effect．
Take，for example，that almost universal hourehold neces sity，the sewing machine．How immensely would its useful ness be increased by an acceptable means of running it：a motor which would require no winding up，which would no easily get out of order，which would be always safe，always
ready，and perfectly under control！A man who should de vise a battery to meat this demand alone would be sure of a fortune．
But this is only one of a countless number of uses to which such a bsttery might be put．
In almost every civilized home，there is water to pump， washing machines to operate，wood to eaw，coal to lift，and a multitude of other labsrs，all of whici might be done ad vantageously by simplselsctric motors，providsd the requi site battery were forthcoming．B ：sides，there is light to fur nish，dorrs and windowa to guard against burglars，errand to run，and accidental fires to repost．It is not impossible that the common dwelling house of the future will rival Houdan＇s in the diversity and completeness of its electrical appliances；yst，without entering the region of speculation or looking bsyond the simple daily needs of ordinary house holds，there is a present call for the services of this fleetest neatest，and most tractable of servants，sufficient to ensure wealth and renown to whoever shall capture and harnes him eatisfactorily
For light manufacturing purposes，the call is equally ur gent．In evary workshop where steam is not used，there are presses，saws，lathos，drills，and numberless other pre－ sent or possible macbines，to which electro motors might be profitably applied．For amateur workm9n，nothiag could be more desirable or more likely to met with immediat acceptance．Then what an admirable contrivance it would be for driviag light wagons or provelliog plaasure boats． There would be no fuel to carry．no fire to watch，no possible explosion to fear ：there would bэ no stabling or grooning to pay for，and no food to buy for the bours of idienesa．Mr． Bergh ought to offer a premium for the invention，simply for the sake of the animals be loves．
Where the range of application is so great，it is need less to multiply examples．Our purpose is $t$ s suggest not to demonstrate，the multicudinou？uses to which a satis factory electro motor may be put，and to call the attention of inventors to the certain reward that will come to whoeve shall overcome the last remaining obatacle．

## A CITY BUILT BY ONE MAN

History aff rds numeroug instancea of the foundation of cities by single individuals，and the beatification and en largement of portions of the same through the munificence of others；but nowhere，as we believe，is it recorded that any of others；but nowhere，as we believe，is it recorded that any
one man from his privatg fortune has ever attempted the sctual construction of a complete town．All the more re actual construction of a complete town．All the more re－
markable，therefore，is the enterpriza which for pome five markable，therefore，is the enterprizs which for pome five years past has jeen quietly pursued by IMr．A．T．Stewart．a gantleman of whose inemense wealth no accurate informa tion has ever been made pablic．The his bates of taxation and the consequent ex rrotantrenta iocident to ownership and ocsupation of dwellings in New York rity have been the means of virtualiy banishing a larg ${ }^{\text {n }}$ number of persons doing business thersin，whore moderate incomes forbid the necessary expenditure，to the adjacent suburban districts． Hence arose a great demand forcjeap homes；and as a result village after village bas aprurg into $\epsilon$ xistence in Long Island New Jersey，and in fact at every point within a radius of forty miles of the metropolis．
Mr．Stewart，in view of this constant exodus of the city population，conceived the un：que idea of building a mode suburban city，where comfortable homes，provided with al modern improvements，could be obtained for a moderate out lay．Accordingly，he purchased a plot of land，ten thousand cres in extant and embracing that portion of Long Ieland known as Hempatead Piains．This is in a campast tract of about ten milosin length by one mile in width，and nearly a perfect parallelogram in shape．Surveying and staking ou the new city followed close upon the açuisition of the ground，and the first work taken in hand was the making of streets ani avenuee，with pavemente，sewtre，culverts and conduits，for blocks of buildinge yet to be erected．Simulta neous with laying the foundations of the houses，was the commencement of gas and water works，and of a reilroad connecting the city with New York．Colike the ueual course adopted in projsctirg new towns in the vicinity of he metropolis，no lots were advertised；nor has any at tempt been made to dispose of the property，as it is the in tention to treat the city as a fingle bodres．finishing it first， and selling it subsequently．The New Yorts Sun aptly de－ acribes the enterprize as a new city springing up，with no Mayor or Council，no asiesements for straet improvemente no taxes for water and gas，no entangling alliances or iseu ing of bonds to secure railroad transportation，no scrambling or grumbling to secure immigrants．
An admirably kept botel，situated in the middle of a fine garden plot，together with some forty housea，are thus far coniplete．The lattor are loca＇ed in lo $0^{\prime}$ s of $200 \times 200$ feet and provided with outhouses end handsomely laid out graunds． They rent for from $\$ 350$ to $\$ 300$ per year on three year leases， and contain every convenience found in the best city dwell－ nge．Work upon this remarkable tomn，to which the name f Garden City bas been given，is rapidly progreseing，and wo understand that the arivantagesoffered are meeting with wide popular apprec：ation．

German Railways．－It apprate that，in consequence of the increased cost of railway working in Germany，as well as in other parts of the world，the rate of intereat realized， on the capital espended on firat establiebment account，de clined last year to $4 \cdot 4$ per cent．In 1869，the corresponding return stood at 64 per cent．An augmentation of 16 per ent in goods rates is required in order to secuce an average interest of $5 \frac{1}{\frac{1}{2}}$ per cent on the capital expended．

