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NEW YORK, SATURDAY, NOV. 3, 1866.

## Contents :

(Illustrated articles arc marked with an asterisk.)


THE USE OF FUEL---MANAGEMENT OF BITU MINOUS COAL.

In our last issue we published a few practical suggestions in relation to the management of fires of anthracite coal. We made the general statement that mineral coal was a condensed form of carbon requiring a large amount of oxygen to produce per fect combustion.

Bituminous coal contains more of the resinous qualities of the vegetable matter from which all coal is derived, than anthracite. It is largely used for the production of illuminating gas, and, where it is employed for heating purposes, supersedes, in some measure, the use of other artificial lights in dwellings. In our own experience we have read, many an evening, by the light of a generously large grate filled with glowing coal. When a lump was placed upon the fire, for a time a volume of dense, black smoke would rush up the chimney, until the heart of the block was warmed by the persistency of the fiery mass below, when it would crack open, sometimes with a report, and send up blue and then bright yellow flames, illuminating the whole room. One thing was noticeable, and that was, that when such a fire was first kindled it would give out no appreciable heat. The energy of the fire seemed to be directed to overcoming the resistance of the fuel. The blue, gaseous flame was somewhat like the popular idea of the moon's light, without heat, yet this blue flame was a highly combustible gas, if it could have been retained long enough in contact with the heat to have mixed with sufficient oxygen. Its value as a fuel was lost by being forced up the chimney to the outer atmosphere.
In the burning of bituminous coal in open fires there should be first a proper grate. Almost all the grates used for this purpose, in dwellings and other buildings, for warming purposes, are too coarse. They allow the finer particles of coal to pass through and get lost in the ashes; or, these particles induce another fire below the grate and tend to melt it down rapidly. When bituminous coal is used in large lumps, much of its valuable carbon is wasted in the form of gas or black smoke, before it can be ignited and give out any heat. The coal should be fine enough to be easily heated and ignited. The sooner this is done the quicker is the fire, and the more the carbon of the coal is utilized. For this reason a finer grate than is generally
used, and smaller coal than that commonly placed upon the fire, is an economical method of utilizing the greater portion of the carbon. The grates now in use can be readily changed to effect this saving by placing a sheet of iron, closely perforated with small holes, upon the inside of the grate bars. We have tried this plan with excellent results.

These remarks are not of universal application; for there are several varieties of bituminous coal, some so nearly approaching pure bitumen as to melt in mass and cake, refusing to be separated permanently until well coked. This sort would require a more open grate or an admixture of coke to make it burn freely. Coke is the residuum of bituminous coals, from which the volatile portions have been driven off, in the form of gas, by heat. It is measurably pura carbon, and of so porous a structure as to readily admit the passage of the atmospheric air through the mass

The philosophy of blowing a fire is simply forcing a larger relative amount of oxygen into connection with the carbon than the ordinary draft would furnish. It acts, also, in a mechanical way, by driving off the products of combustion, the principal of which, carbonic acid gas, is as inimical to a clear fire as to animal life.
The proper management of a fire then, consists in furnishing oxygen in quantities sufficient to burn all the carbon, A good draft is necessary, and the coal should be fed upon the fire in small quantities. If a dense, black smoke is the result of replenishing the fire, some of the most valuable parts of the carbon are carried, unconsumed, up the chimney and entirely lost. The fire should be kept always bright and it will, to a great extent, consume its own gases before they can escape. As in anthracite, so in bituminous coal, the remains of the fire are valuable. The unconsumed coal is more or less coked and will more readily ignite than the green coal. None of this should be wasted.

A little attention to the management of fires in our dwellings, by those who understand the philosophy of combustion, would result in a large annual saving. Even the most ignorant servant can be readily taught how to regulate the supply of fuel and air by a few simple directions, whether the science of fire and fuel is understood or not. It should always be remembered that the pure white or yellow flame is that which yields the heat. Dark smoke and blue gases are not the results sought for in burning fuel

## BOILER EXPLOSIONS NOT ALWAYS MYSTERIOUS

At intervals, recurring with terrible frequency, the readers of our public journals are startled and shocked-if familiarity has not induced callousness -by accounts of steam boiler explosions, attended always with loss of property, and often with loss of life or limb.
To no other subject is the old adage, "in too muoh discussion the truth is lost," more applicable than to that of boiler explosions. The cause of these ca tastrophes has been so muddled by wordy dissertations, mysterious theories, and senseless conjectures, that few think of looking directly at the facts of each individual case and deciding each on its own evidence. Mysterious agencies, under the names of " contraction," " expansion," " electricity," " development of explosive gases," and others, figure conspicu ously in the reports of committees of inquiry. The causes which are most obvious, or could be most easily ascertained, are overlooked, and the investigators go prowling about among unknown or not understoo forces, to find that which frequently is before their eyes. Braces originally too weak, corroded, or improperly located ; plates running longitudinally instead of circumferentially; defective riveting ; plates weakened by large holes not filled with the rivets deficiency in the thickness of plate; poor iron, and carelessness in calking, are overlooked, to say noth ing of corrosion from impure water, hard firing, or neglected water feed, and incompetent attendants. Sometimes, in riveting, the holes in the plates diverge half their diameter, and they are reamed to a circular form, or enough to admit the ordinary rivet, which cannot fill the space, and depends for its security wholly on the juxtaposition of the heads with the surface of the plates. Heat expands the iron, loosening the rivets, the water works through, and,
if containing salts, rapidly oxidizes the iron, opening the way fora rupture. The careless use of the calking chisel sometimes cuts into the plate one-third or one-fourth of its thickness, so that when an explo sion occurs the line of the fracture follows the channel thus made, as the breaking of glass follows the diamond scratch.

In connection with these remarks we cannot help referring to an accident on a fine steamer only a few months ago, by which a number of persons lost their lives. An investigation was had before the coroner's jury, which resulted in a perfect mystification. Yet the cause or causes should have been apparent in several facts which were ascertained. First, that part of the boiler that gave way was so deficient in substance that, at the maximum working pressure, the iron was strained to nearly its rupturing limit; the factor of safety, instead of being 5 or 6 , being hardly above 0 . Second, the sheets, instead of be ing placed circumferentially so that the joints would not be so long in the direction of the length of the cylinder, and so that each would support the adjacent ones, were placed with the long diameter running lengthwise. Third, the calking iron had injured the iron along the seams nearly 20 per cent, and the braces were placed in an improper manner
It can scarcely be contended that this was an exceptional case. It is to be feared that many of our boilers would not stand a thorough scrutiny on these points. Mr. Edward B. Martin, an eminent engineer of Stourbridge, England, recently read before the Institution of Mechanical Engineers a paper which exhibited the following facts:-During the presen century there have been 1,045 boiler explosions in England, causing the death of 4,076 persons and injuries to 2,903 . Of the 1,045 explosions, 397 were "uncertain " as to cause ; 137 were from over-pressure from the wedging or over-weighting of safety valves, or from other acts of carelessness; 119 from collapse of internal flues; 114 from shortness of water, or rom incrustations, and 9 from extraneous cause not immediately connected with the boiler. From these facts Mr. Martin expressed himself as opposed to all ideas of internal detonation, spontaneous generation of explosive gases, or other mysteries.
If this is approximately a correct exhilit of the causes of boiler explosions in England, need we look for some mysterious and unknown agency to account for similar occurrences here? It is well known that English mechanics and engineers are held to strict accountability by the laws, much more so than in this country. It may be claimed that the tenacity of American boiler plate is superior, and such extreme caution as is enforced in England is unnecessary here ; but in this matter as in others it is " better to be foolishly careful than foolishly careless."
We believe that a rigid examination of boilers and a thorough oversight and testing during the process of manufacture, as well as after completion, enforced by legislative penalties, would prevent some, at least, of the destructive explosions we are too often called upon to deplore.

## A Uniform Money Standard.

France, Italy, Switzerland, and Belgium have re. cently entered into a convention to regulate the currency of their respective governments, and bring it to a uniform standard of weight, value, and form. They agree not to coin, nor allow to be coined, bear. ing their impressions and designs, gold money in any other forms than those of gold pieces of 100 f , $50 f, 20 f ., 10 f$., and 5 f., fixed as to weight, values, al lowances for loss, and diameter according to a cer tain scale. A fixed regulation allows for wear and loss. The convention also fixes the denominations, values, sizes, etc., of silver coins, and also restricts the amount to be coined by each country to a certain proportion to their respective populations.
This may be regarded as a step of very great im portance in commerce. Its effect on the social im provement of the people and civilization generally will be very marked. To make the change more effective, the United States and England should join the convention, which would ultimately compel the co-operation of every European nation. The distinctive legends of each nation will, of course, be retained on their coins, but the values of the coins would be identical with those of similar denomina-
tions belonging to other countries, The annoyances of emall exchanges would be reduced, if not entirely removed, and the loss by brokerage be aroided.

## NEW PUBLICATIONS.

The american House Carpenters' and Joiners' Arasstant. By Lucius D. Gould, Architect.
This is the title of a large quarto volume, in which the science and practice of building wooden structures is fully treated. It is illustrated with forty-four lithographic plates, and gives direc. cal and dratting instruments. Valuable tables of the relative strength and other properties of materials, and other usefulinfor mation make this a valuable vade mecum for the practical work man.
Atlantic Monthly.
The number for November is very excellent in every respect. The Publishers announce, for 1867, a Serial from Dr. O. W.Holmes, a series of articles from James Parton, and frequent papers from Ticknor \& Fields, Boston.
Address on Presenting to John Ericsson the Rumford Medal of the American Academy By E. N. Hosford, late Rumford Professor in Harvard University.
We have received from the author a copy of this pamphlet ẅhich is valuable as giving a resume of the inventions and val uable discoveries of this distinguished engineer. It states that Ericsson built the first successful propeller having all its machine ry below the water line-the Francis B. Ogden-which was reject. ell by the Lords of the Admiralty of England, on the ground that "it would be impossible to steer a vessel where the propelling power was so near the rudder. Mr. Ericsson came to this coun try, bringing the machinery of the Robert FF. Stockton, and short ly after built for the Government the screw stesmer Princeton. Theidea of the monitor class of war vessels was conceived by Ericsson in 1854 , when he submitted to the Emperor Napoleon a plan tor such ships. Capt. Coles, of the English nevy, dates his first idea in 1850. Capt. Ericsson is well known for his hot air en-
Eines, but his crowning glory is the total change in war ships, inames, but his crowning glory is the total change in war ships, in asgurated by his celebrated Minitor.
by Hurd \& Houghton, Boston, Mass.
Report of the Secretary of tife Smitisonian Institution, January, 1866.
This Report we shall take occasion to employ hereafter in the elucidation of several subjects upon which it briefly treats. In the meantime we may state that it contains
interest on many matters of importance.
Hubsey, Wells \& Co., of Pittsburgh, 'Pa.,
In reply to the ninth question of the U.S. Revenue Commission, have published a pamphlet consisting mainly of the certificates in evenness and excellent qualities. ectures on A
Prof. S. W. Johnson, Yale College.
A series of four lectures, illustrated with cuts, and the facts exemplified and made practical by experiments. The subject of chemistryas applied to the tilling of the soil is treated in this
pamphlet in Prof. Johnson's usual lucid and practical style. He pamphlet in Prof. Johnson's usual lucid and practical style. He has already done good service to the agriculturists of the country
by his lectures, occasional addresses, and publications on this subby his
ject.
ject
Curious Questions. By Rev. Henry A Brann, D.D.

This is a work on mental and moral philosophy, valuable to the mechanician and the natural philosopher merely, or, at least mainly, because it refers incidentally to the operation of natural laws.
Woodward's Arcilitecture.
This neal volume is issued by Geo. E., and F. W. Wood ward, at the oflice of the Horticulturist, 37 Park Row, New York. Many of our readers will recollect "Woodward's Country Homes," jresent volume is the first of an annual serics, intended to aid in the hutlding of farm houses, villas, barns, ice houses, and other structures pertaining to countrylife, as well as to direct in laying out grounds in gardens, orchards, walks, drives, etc. It is profusely lustrated with plans and designs, and formsanattractive and readable volume to those whodo not intend to followit; directions, as well as a valuable manual to all who make the country thei home.

## Inventions Patented in England by Ameri

 cans.sondensed from the "Jcurnalof the Commisslonersof Patents." PROVISIONAL PROTECTION FOR SIX MONTHS. 2,296--Slide Valve for Steam Eneine.-William B. Robinson
Detroit, Mich, and Zoheth ${ }^{\text {a }}$ Durfee, Philadelphia, la. Sept. 7 2,298.-BEER AND ALe. $\rightarrow$ John Schneider, Williamsburgh, N. Y
Sept. 7 , 1866.
 9,316.-Manufacturing Leavier.-George V. Sheffield and
James F. Coburn, Hopkinton, Mass. Sept. 8, 1866.
 2,329.-Elegtric Telegraph Conductor..-John M. Batchelder,
(ambridge, Mass. Sept. 10 , 1866 . 2.358. - Horse. Rase. - Daniel G.Adelsberger, Emmittsburg, Ma.
nid Richard R. Rehes, and Charles J. Watts, both of Norwich
county of Norfolk, England. Sept. 14, 1866 . county of Norfolk, England. Sept. 14, 1866
2,369.-Bratding Machine and Warp Requlator.-William
funstill, Paterson, N. J. Sept. 14, 1866. 2,463.-Printina Machine.-George Gordon, New York City
Sept. 19,1866 . 2.484.-Bronaing Machine.-John K. Lowe, Cleveland, Ohio.
sept. ${ }^{2}$. 1866 .



ISSUED FROM THE U. S. PATENT OFFICE for the week ending oct. $23,1866$.

> Reported oftcially for the Scientific American.

P若 Pamphlets containing the Patent Laws and full particulars
ofthe mode of applying for Letters Patent, specifylig size of
ond

58,964.-Screw.-John Absterdam, New York City Iclaim the above-described wood screw, with the plain cylin
drical poltion betwen the point and the threaded portion, suib drical pol tion bet ween the point and the th
stantially as and for the purposes set forth.
58,965.-Gate.-Henry Adams, Seattle, Washing ton Ter.
Iclaim a gate hung to its post by means of a hinge, E, which passes through a vertical slot, I, and is held to the gate by annt 58,966.-Hoe.-Sherman W. Adams, Wethersfield, Conn.
First, I claim the combination of the blade, a, an d handle, $b$,
hen contructed and operating substantially as b erein shown
d described. nddescribed.
Second, The
58,967.-Fred Cutter. - William F. Altfather Jolnnstown, Pa .
First, I claim the combination of the inclined or diamond-shaped knife sash, connecting rod or bar, I, and eccentric, F, with each
other , and with the driving hatt, C cutter rrame, B, and box, $A$ substantially as herein show and described and, , ent levers, $O$
Second, The combination of the jows, $P$ and Second, The con bination of the jinw, P and S, bent levers,
and R, and pivoted cam lever. N, with each other, and with the
cutter box, A, support, M, and eccentric, F, substantially as here
in shownand described, and for the purpose setforth.
58,968.-Mechanism for Operating the Har ness of Looms.-William R. Andrews, Mystic River, Conn.
I claim the above specifed new and useful harness-operating
mechanism or combination, consisting of the tri-anned fever, 1 , mechanism or combination, consisting of the tri-anmed ever,
the two cams, E F, the gears, cc, and racks $G$ H, the spring, I,
and the rack-elevacing mechanism, the whole being arranged to and the rack-elevating mechanism, the whole bcing arranged to
gethe, nd with a pattern chain, and its actuating mechanism,
substantially in manner and so as to operate as explained. 58,969. - Instrument for Extrac'ing Corks
from Bottles.-J. T. Ashley, Brooklyn, N. Y. I claind the slide, $F$, in combination with the tongs, A, when
arranged thereon, so as to operate substantially in the manner and for the purpose described.
8,970.-Apparatus for Moving Buildings.Egbert H. Avery, Belvidere, Ill.
I claim the ouide keys, D, in combination with the trineiss, $\mathrm{C}^{\prime} \mathrm{O}$
B, substantially as set forth. 58,971.-Butter Worker and Packer.-Charles
F. Barager, Candor, N. Y.
 , and packer, J , and the whole operating substantially as de
58,972.-Pump.-A. B. Barlow, Ripon, Wis.
I claim the method substantially as above described of packing
the lower joints of the cylinder and said chamber ly mean 3 of a botton piece, I, and annular f ange or cap, N, and the packing
naterial, a a, secured by them by the aid or a aurrounding fang N', substantially as described.
58,973.-Corn Plow.-Peter Barnhart, Chillicothe Ohio.
I claim the ad justable fender, $F$, and beam, A, in combination
with the standards, $B$ B, for the purposes and substantially as de
scribed scribed.
58,974 .
8,974.-Straw Cu'tter.-John W. Bartlett, Harmar, Ohio. Antedated October $12,1866$.
First, I claim the knife, c, oscillating arm, D, and standard and
 Second, I claim the combination of the crank, , attached to the
end of the ty w eeel shaft, the lever P, nd the bent pawwl lever,
H, with the ratchet wheel and feed rollers, substantaally as set
forth. Third, I claim the pawl holder and guide, I, constructed and
connected together as set forth. Fourth, I craim the hinged board, $O$ ', with its shaft, $P$ ', in com
bination with the bent spring, $S^{\prime}$, substantially as and for the purpose set forth
58,975.-Composition for Roofing.-F. Bearse
and G. E. Hopkins, Barnstable, Mass.
We claim therefor the composition as made of the acid and
other ingredients, substantially as herelibefore set forth. 58,976.-CHURN.- M. Bratt, Maysville, Ky First, 1 claim the combination of the hollow tube, E, having th having a aralve, d, at itsupner end, and withthe bottom, a, or'the
courn, A, substantally as here'n described ancl for the purpose set forth. The com bination of the g uide rod or plunger, F, with and with the bottom, a, of the churn, A, substantially as herein
described and for the purpose setforth. 58,977.-Grinding Minh.-Charles P. Benoit, De troit, Micl.
Iclatin the machine for crushing grain consisting of the long tudinaly groored roller, B, and the transv erses y groved eylin
der, , arranged to operate substintially as described for the pur 58,978.-Creasing, Slicking, and Skiving Leath Er.-C. C. Bellows, New Ipswich, N. H.

Second, The plate, J, having ekiving knives, d, attached to or
Sinner
formed on it, and applied to the upper roller, C, by means of the
bars or clamp rame, substantlafly as and for, the purpose de-
scriped.
Third, The laterally-adjustable creasing wheel, $F$, on the uppe
58,979.-Piano Stool.-Joshua Briggs, Peterboro $\underset{\text { N. H. }}{\text { N. }}$
thade with a wood serew cut unan its outersurface for sccuring it
pemmanty to the pllar, substantially as describe
I also
 the bolt at the bottom of said tube, substantially as set forth.
58,980.-S'TEAM-ENGINE SLIDE Valve.-Richard C. Bristol, St. Clair, Mich.

I claim, in connection with a slide valve, the withindescribed
arrangenment of rollers, C, mounted concentricaly upon the eross
bars, C, and betw een the iongitudinal bars, C2 2 a and arranged bars, c, and betw een the longitudinal bars, ca ch, and arranged
to operate relatively to the valve, and to the cylinder face, and
to the steam chest, substantially as and for the purposes helein to the stea
specifted.
58,981.-Amalgamator.-Edmund Browh, ChicaI clâm, Firs tures and First, The revolving and stationary shaft, with aper
Second, The series of ecing the quartz out into the lead. Second, The series of combs attached to the revolving shaft and
sides of the kettle, the whole conbined and arrange d for the pur 58,982.-Window Screen:-Edward Bucklin, Jr.
and Sedgwịck A. Sutton, North Providence, R. I.

We claim attaching the screen directly to two supporting rails,
and $\mathrm{D}^{\prime}$ in such manner that the width of the screen may be Dand D' in such manner that the width of the screen may be
increased or diminished tn the same proportion as the lengtlis of
he rails, as and for the purpoes descrijed. the rails, as and for the purpose descrijed.
58,983 .-FARm Gate.-John A. Cheatham, Nash ville, Tenn.
I claim, Firet, The oombination of the lever or leyers, A A, with
the vertcal spindle, E, controlling the gate and its latch, with the camertcal spiece, $\mathbf{O}$, or its equivalent, substantially as and for the
cam Second, The combination of the lever or levers, A A, and the
spinde, F, with the upper disk, L, the trigger, K, and latch, J ubstantially as and for the purpose described.
58,984.-Ladder.-ar. Ckertizza, New York City. I claim the combination of sides so sloping that the narrow end
of one sectional ladder fts within the wider end of any other,
with the slota, dand ac, and thc bars, b and b' b', substan
tially as doscribed and for the purpose setforth tially a 58,985.-Fan Blower.-Patrick Clark, Rahway, N. J.

I clain, First, The diaphragms, C C , when used in combination with a compound fan blower.
Second, The fan wheel, Fhen constructed with fans or
vanes of the form and arrangement with respect to each other as
described
Third, Attaching each fan or vane at its ends to two ad jacent Fourth, The leather packing, D D, when combined with the
diaphragms, C as descrived. 58,986.-Corn Shelider.-William Colwell. Chillicothe, Ill.
I claim, in combination with the cone, B, shaft, $\mathbf{C}$, and hopper,
F, the fan, N , andelevator, T, for the purposes and substantially
as herein set forth. 58,987.-Safety Valve.-D. G. Coppin and G. H Clemens, Cincinnati, Ohio.
We claim, First, The Valve, C, and tubs, m, constructed as abe described and ior the purpose set for th.
Second, The valve, C, , vevc, , weights, D and D', arranged as
 58,988.-Corn Planter.-W. H. Cox, Virden, Ill. Firs, I claim the perforated, horizontal, revolving plates, mm m,
in the hoppers, D D, tor feeding and drapping the trains or corn
evenly in combination therew thin and with the bever gear wheels.
 substantially as and for the purposes herein described.
Second, I claim the thimble, $a$, within the hub of the driving Wheel C, for carrying the pulloy, b, in combination therewith,
and with the stationary axle, $B$, constructed and operating sub:
alan stantially as and for the purposes herein specifled.
Thir
I
claim the arrangement of tine side pleces, fif, hung upo the axle, B, for supporing the hopers, D D, and ranging nond
lowering at pleasure with ine lever, $F$, substantially as herein described.
Fourt, I claim the slide piece, $G$, with the push and pull pawl,
O${ }^{\prime}$, for working the seed-ro pping a pparatus by hand when ad. justed for planing corn in hills, in combination with the revolv
ing perforated plates mim to which the impart an intermiteent 989.-Machine for Sibipping the Top Flat of Carding Engines.-S. L. Crockett and
Benjamin S. Mills, Lowell Mass. Benjamin S. Mills, Lowell, Mass
We claim the employment of the lifting and replacing cam
formed substantially asherein set forth and shown and urrangerl
to operate in the manner and for to operate in the manner and for the purnose specitited.
And in combination with the lifting and replacing cam, formed
and made to operate as herein set forth, tie two pins, 1 and 2 , in And in colnoination with the irtung and replacing cam, formed
and made to operate as herein set forth, the two pins, 1 and 2 , in
the slide, h, acted upon by the cam, in the manner and for th?
58,990.-Hardening Springs.-George G. Crowell
Lime Rock, Conn.
I claime employnent of glue, or equivalent giutinons anima
matter, either alone or in coubination with other material as nater, elther alone or in coumbination with other material, as a 58,901 - Table and Holder fon
58,991.-Table and Holder for Shearing Sherp I claam the table, Ber, Bedford, Ohio.
I claim the table, B, arms, C C', pawl and ratchet, a b, and
bitackle, D, constructed and arranged as and for the purpose speci-
tied. 58,992.-Knife Carrier.-Porter E. Cummings, Sanford, Me.
I claing the improved knife carticr, inade substantially as de
 58,993.-Hand Seed Sower.-Obed Dann, Janes ville, Wis.
I claim, First, The combination of the box, A, and shide, E, when
construcled, arranged, and used substantially as and for the purpose set forth.
Second, The combination of the box, A, cap, B, and handle, $C$
when constructed, arranged, and used substantially as and for the purpose set forth,
Third. The combination of thebox, $A$, slide; $E, \mathrm{c}=\ldots, \mathrm{B}$, and handle C, when constracted, arranged, and a sed substantinlly as and fo
the purpose set forth. 58,994.-Bed Bottom.-Garret B. Davis and Chas B. Davis, Freeport, Ill.

We claim the strengthening rods or girders, $\mathbf{E}$ E, tin combina
tion with the bo b-shaped cross pieces, Co, and elastic bands, $D$,
substantially as specified. 58,995.-Table.-Ernest Dinter, Boston, Mass. I claim the improved table stand as having two parts, a D , con
streited with receiving slots, arcanged in them so as to
hem to be applied together, substantially as set forth. 58,996.-Steam-engine Governor.-E. C. El monds, Buffalo, N. Y.
 producing an natermittent motzon to the valve-operating mechan-
in, also claim, In combination with the the above, the screw

