

**Wonders of Natural Gas.**

The *Pittsburg Dispatch* says: Pittsburg is again a great gas city. Never since the early days of natural gas has this precious fuel been so abundant. The prediction by the *Dispatch* at the discovery of the Pinhook field that there was an abundance of gas for ten years has more than been fulfilled. With the additional discovery of the new field at Elizabeth, gas experts claim the outlook was never brighter. The Philadelphia Company, it is said, is even reaching out for contracts from manufacturers, a thing it has not done for several years.

The men best posted claim there will be more gas in Pittsburg this winter than any time since the palmy days of the Murrysville and Grapeville fields. Though gas is again plentiful, the value of it is thoroughly understood. The prices now paid are the greatest ever known in the history of the business. The famous Snee well has been purchased by the Carnegie Steel Company, Limited. The exact amount paid by the company for this territory is not known, but the price asked by Mr. Snee for his famous well and the lease of 3,500 acres of land was \$150,000.

The far-famed Hess well, which was the first discovered in the great Pinhook field, is now practically supplying all the Philadelphia Company's lines. From this one well is drawn the supply for the Brilliant and Herron Hill pumping stations and all the towns along the Allegheny River from Tarentum to Pittsburg. Notwithstanding this tremendous strain, it is claimed 20 per cent of the gas is blowing off at the well. It is like the early days of natural gas, when the pressures were so high it was impossible to hold the full volume in the lines. A remarkable fact in regard to the Pinhook wells is that they have been constantly increasing in pressure since they were first drilled. This is especially true of the Pinhook wells that have been drilled near Milltown. They now gauge double what they did when completed.

The Hess well is now acknowledged the largest gas well and greatest volume well that has ever been struck in any field. This is proved by the fact that it supplies nearly all the Philadelphia Company's lines. The well is actually doing more than any six wells the Philadelphia Company ever had in either the Murrysville or Grapeville fields were ever able to do. At six o'clock on the evening of August 5 there was a line pressure of 987 pounds at the well.

The Philadelphia Company has never had a line pressure equal to this since the days when the Murrysville and Grapeville fields were at their height.

The drill has proved the enormous extent of the Pinhook field, though it has as yet set no limit to its richness. It is from 15 to 20 miles long, and no one yet knows how wide. With this field and the one at Elizabeth at the big Snee well, it shows more gas in sight for Pittsburg from these two new fields than ever before.

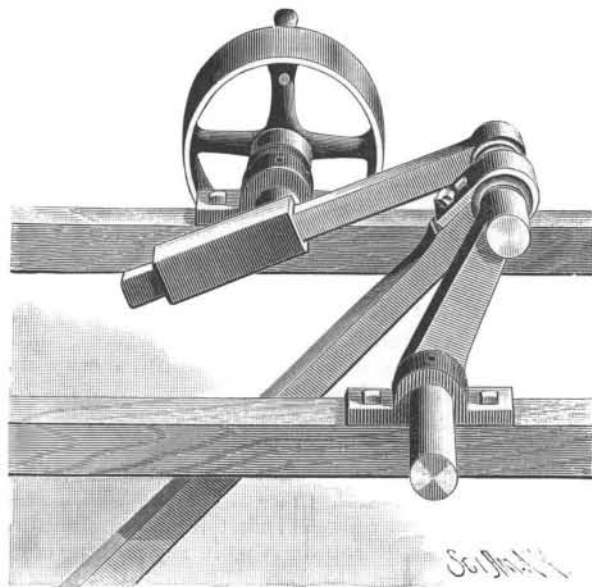
Though the Philadelphia Company was unable to come to terms with Mr. Snee, it purchased a farm in fee simple close to the Carnegie lease. One portion lies so close to the Snee well that the company is now putting up a rig within 125 feet of the great gasser. The supply already assured in Pinhook, with what is expected there, puts not only this company, but the People's Company, in as good condition as ever.

**The Fastest Bicycling.**

John S. Johnson, of Minneapolis, on September 22, rode a mile on a kite-shaped mile track, at Independence, Mo., in 1 minute 56½ seconds. Experienced timers and judges are said to have taken the record, to avoid possibility of error. Two horses hitched to sulkies used to encourage the trotters in their work were selected to make the pace, one going to the half mile, while the other accompanied the wheelman over the latter part of the journey. Johnson set a record-breaking clip from the start, covering the first quarter in 29½ seconds. The half was reached in 58½ seconds, and here the tired horse pulled out. A fresh one came in front of the plucky rider. The three-quarter pole was reached in 1:28½. It hardly seemed possible that the wheelman could keep up such a clip, but he never faltered, and finished the mile within two feet of the runner's sulky in the wonderful time of 1:56½. This performance gives Johnson all the world's records from a quarter of a mile to a mile, and demonstrates his superiority as a short distance rider.

**AN IMPROVED MECHANICAL MOVEMENT.**

The form of mechanical construction shown in the illustration is more especially designed to facilitate the conversion of reciprocating into rotary motion, at the same time avoiding all dead center positions. The improvement has been patented by Mr. Peter A. Bouchet, of Merced, California. It will be seen that one of the shafts carries at its inner end a socket or sleeve in

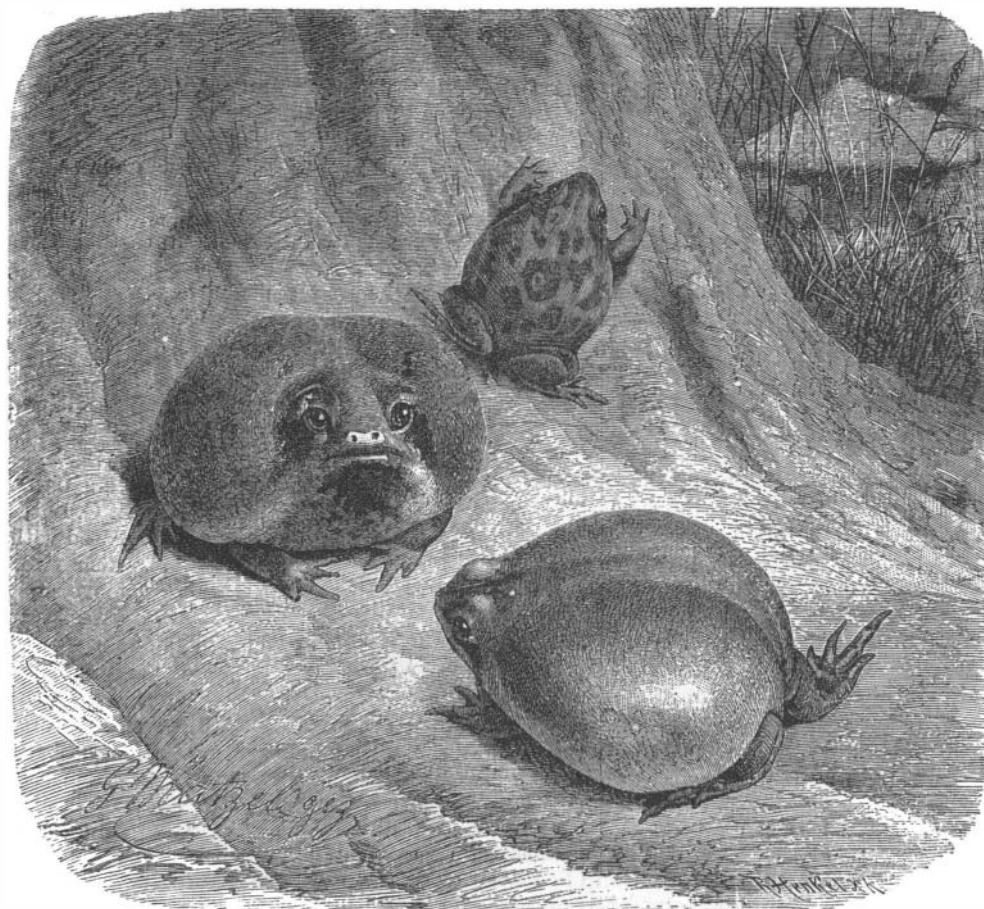


**BOUCHET'S MECHANICAL MOVEMENT.**

which slides a bar pivotally connected with the wrist pin of a crank arm attached to the end of another shaft turning in suitable bearings. The centers of the shafts are eccentric to each other, and the wrist pin is connected by a link or pitman with a treadle, the operating of which turns both shafts.

**BREVICEPS MOSSAMBICUS.**

The picture of these strange creatures reminds one at first glance of rubber balls or stuffed pancakes. Their greatest length is 1½ inches, and their color is a dirty brown on top—sometimes spotted with black—and white underneath, a black band running down from each eye, and the center of the throat being black. On the tarsi of the hind legs there is a hard, sharp-edged callus, an instrument which is probably used by this slow creature, whose only means of locomotion is crawling, to dig up termites, on which it is supposed to live. The smallness of its mouth, the shape and length of its tongue, the lack of teeth, etc., also seem to indicate that this is the nature of its food.



**BREVICEPS MOSSAMBICUS.—(Natural size.)**

The home of this frog, of whose habits we know nothing, is the island of Mozambique and the adjacent mainland.

The accompanying engraving is taken by the *Illustrirte Zeitung* from the seventh volume of Brehm's "Thierleben," which has lately been completely revised by Dr. Boettger.

**Brown or White Sugar.**

A question that will certainly open up considerable discussion in the future in the manufacture of beet sugar in the United States is, to know if all processes for the manufacture of white crystallized sugar at the factory are to be abandoned in face of the well organized syndicate of the American Sugar Refining Company, which evidently has greater facility for the refining of sugar than would be possible in an ordinary beet-sugar factory.

Even in the present early stages of the industry opinions appear to be very much divided. Some of the factories make a white crystallized sugar testing 99°, while others prefer confining their efforts to raw sugar manufacture and to sell their product to refiners who are willing to contract in advance for all sugar made. From want of space we are not able to enter into the question in detail. It is interesting, however, to call attention to a successful process of manufacturing white crystallized sugar at a low cost, and for which the machinery required costs but a few thousand dollars. A *cleare* is made with the sirup from multiple effect. This is concentrated to 36° B. at a temperature of 104° F. The *cleare* thus obtained is, in reality, a supersaturated sirup. The green sirup from *masse cuite* is swung out in centrifugals; 10 per cent of the *cleare* above described is then added, during which time the outer surface of the centrifugal drum is heated with exhaust steam. The sirups running from centrifugals during this operation are subsequently mixed with sirups entering vacuum pan. Special steam injectors complete the sugar washing, and it is said that about 64 pounds white crystals, testing 99°, may be extracted from 100 pounds *masse cuite*.\*

It is interesting to compare this process with that of raw sugar extraction, considered on a basis of dollars and cents. For example, we may suppose that beets worked averaged 13 per cent sugar. By American processes there may be extracted per ton of beets 150 pounds brown sugar, testing at least 88°, and worth 26 cents per pound, and 50 pounds of a second grade brown, which would have a ready market in New York at 23 cents per pound. The total value of these raw sugars would be about \$5.05. On the other hand, by the process above described, from one ton of beets there could be extracted 129 pounds of high grade white crystallized sugar, testing 99°. At present market prices this would bring over 4 cents per pound, to which must be added 21 pounds of a lower grade sugar that would have a steady market at 23 cents per pound. In this case the total value would not be less than \$5.60 per pound. Thus there remains a difference of 55 cents in favor of the process under consideration. For a campaign of 20,000 tons there would be a profit of \$11,000. Just within what limits this figure is correct remains to be determined by practical experience.

Whatever may be the results obtained, the experiment is worth trying. We shall be pleased to publish any practical data on this point that may be sent to us.

By adopting above method of manufacture there need be no cause for Northern sugar makers to envy Southern sugar manufacturers, who get a bounty upon sugar of 80 per cent test and of quality that may enter into immediate consumption.—ED.—*Sugar Beet.*

**Reports from the Great Fair.**

The list of British exhibitors in the industrial section, according to advices from Great Britain, already numbers fully 5,000. The best exhibits will be those of pottery and dry goods.

The bonds bear 6 per cent interest, dated November 1, 1892, payable on or before January 1, 1894. They will be issued in denominations of \$100, \$500, \$1,000, and \$5,000. An estimate in the prospectus set forth that the probable receipts of the exposition would be \$34,500,000 and the disbursements \$21,250,000.

The attendance of visitors is increasing. On a recent Sunday 15,000 persons passed through the turnstile. During the week the average daily attendance was 3,000. The officials regard

these figures as a convincing argument in favor of keeping the exposition open Sunday. Most of the visitors to the park on Sunday are laboring men and their families.

\* *Masse cuite* is 8 to 10 per cent the weight of beets worked, which corresponds to 200 pounds per ton.

## Magnetic Particles from Auriferous Ores.\*

BY MR. WALTER B. BASSETT.

The demagnetizing of ores containing magnetite or magnetic pyrites has received considerably more attention in America than it has in England, and at the present moment there exist several methods of magnetic extraction in the former country which have attained more or less success in the treatment of granular magnetic ores. The great difficulty which lies in the way of devising a satisfactory process for treating these ores is the fact that, unless the particles are thoroughly disseminated, the magnetic grains, while attaching themselves to the magnets, are apt to inclose certain of the non-magnetic granules with them, and to carry them into the portion of the apparatus destined for the magnetic grains alone. This difficulty is more acutely felt when treating magnetic pyrites or other ores possessed with only a feeble magnetic force, as the stream of magnetic particles must then be directed so close to the magnets that, unless the opposing forces are nicely balanced, there is great probability of error occurring. When the grains vary largely in size it is preferable to screen the ores before subjecting them to a magnetizing process, as it is obvious that extremely fine grains of matter are far less susceptible to the action of any force when acting through a medium, such as air or water, than are grains of a larger size. It therefore follows that an apparatus that is perfectly capable of refining an ore, the grains of which are of fairly uniform size, will fail to do so at one operation when there is a large discrepancy in the size of the particles to be treated.

Experiments have been made on zinc slimes from a mine in the Pyrenees, where some difficulty was experienced, owing to the quantity of magnetite present. In this case a successful treatment was effected by a dry process, but inasmuch as this involved drying the ores before demagnetizing them, an extra expense had hitherto been incurred. But the results of experiments have led the writer to believe that a slightly modified machine, constructed on this principle, will be able to cope with the slimes as they come from the grinding mills, without having to previously dry them. In the case of a sample of magnetic pyrites containing nickeliferous ores the magnetic power possessed by the pyrites was so feeble that a stream of particles descending through water within one-half inch of a powerful magnet was not deflected appreciably, and in order to effect a magnetic separation the particles had to pass within one-eighth inch of the poles of the magnets. For ores of this class it is doubtful whether an economical magnetic separation can be effected, as with such a limited area open to the passage of the grains, as would necessarily be the case, the plant would have to be of very large size to treat ores in quantity. The simplest problem by far is the treatment of the so-called iron sands, found in many countries extending for miles along the seashore. These sands, with the exception of portions where gravel is interspersed, have the grains of fairly uniform size, and, for the most part, with the rough edges rounded off by the action of the water. The grains of these sands, possessing a specific gravity of 5, will readily sink through water, and the separation of the magnetic from the non-magnetic grains can be easily effected through this medium.

A great deal of difficulty has been felt in many auriferous districts in dealing with the ores for gold extraction by processes dependent on the action of specific gravity, owing to the fact that the specific gravity of magnetite is so high as to cause it to remain with the gold after the washing process has been performed. Many sea beaches in New Zealand and California are composed of alternate layers of magnetite and quartz sand, and after a period of heavy gales, when the surf has subjected the sands to a continual washing, the layers of magnetite and gold are found to be almost free from quartz sand, and the line of demarcation between the light colored sand deposited in fine weather and the black sand before mentioned is very plainly seen. It is at this time that the "beach comber," as the alluvial gold miner of the sea beaches is called, reaps his richest harvests. With his beach box, which is a combination of amalgamated copper plates and riffles worked with a stream of water, he washes the sands of his claim over and over again, and rarely finds that gold is absent from them.

It is from these sands, when properly treated by a demagnetizing process, that the largest amount of gold may be obtained. Working on this principle the magnetite once and for all will be properly separated from the gold, and unless further deposits of gold are washed up from beyond low water, as some miners believe, the whole of the sands may have all the gold contained therein extracted at a low cost and without the possibility of error. In many cases chemical processes can be substituted for the amalgamation and washing processes, but the problem as regards these may be summed up in a very few words as follows: Will the amount of gold obtained be from  $\frac{1}{4}$  ounce to 1 ounce per ton? If not, these processes may be dismissed without further thought, as the writer believes

\* Abstract of paper read before the Federated Institution of Mining Engineers, September 7, 1892.

that the cost of the most modern of the cyanide or chlorination systems, with the most favorable adjuncts, cannot be brought below £1 per ton of ore treated, while many others cost a good deal more.

With electro-magnets the cost of treatment when water power is procurable is estimated at 1s. 6d. per ton, made up as follows: Attendant at turbines and dynamo, 1s. per hour, or 3d. per ton; attendant to feed sand to machine by means of a centrifugal pump, 1s. per hour, or 3d. per ton; attendant to remove the refined products, 1s. per hour, or 3d. per ton; depreciation of plant, repairs, renewals, balance of trade, charges and expenses, taken at 9d. per ton. Making a total of 1s. 6d. per ton, a very small item when compared with the 20s. per ton of a direct chemical process; while the fact that pure magnetite is obtained as a by-product should not be overlooked, when it is remembered that no better ore for the manufacture of steel exists than magnetite.

## A National Gallery of History and Art.

Franklin W. Smith, of Boston, is the originator and promoter of a scheme which contemplates the erection of a national gallery of history and art in the city of Washington. The American people are in oceanic separation from all the remains of an older civilization, and notwithstanding the present facilities for transatlantic travel, there are many who, either from lack of time or money, must forego the culture and pleasure of a European trip, to say nothing of its educational advantages. By such people, the present scheme should be hailed with delight. In brief, the plan is as follows: To erect in Washington, D. C., in some commanding position, a range of galleries one story in height, terraced upon a hillside. The design prepared by Mr. James Renwick and Mr. Smith calls for eight historical galleries, viz., Egyptian, Assyrian, Greek, Roman, Byzantine, Mediæval, Saracenic, and East Indian, these to be ranged below American galleries for illustration of the history and portraiture of the United States, the group to be ultimately surmounted by a memorial parthenonic temple, an American Walhalla, such as stands to-day in grandeur and beauty upon a hill top overlooking the Danube, a proud manifestation of the artistic inspiration and patriotism of the Bavarian people. It is proposed that the galleries shall inclose small parks in which constructions of the above named types can be erected in full size. The galleries are to be filled with mural paintings illustrating the history of the people to which it is devoted. That Mr. Smith is not a visionary enthusiast is shown by the "Pompeia," the matchless restoration of the house of Pansa at Pompeii designed and built by Mr. Smith at Saratoga Springs, N. Y.,\* and in the Villa Zorayda, his winter home opposite the Ponce de Leon, in St. Augustine, Florida, a magnificent replica of parts of the Alhambra.

The expense of a construction of this kind, though large, would by no means be as great as might be expected from the ground plan. A conservative estimate places the cost of the galleries at \$5,000,000, or \$10,000,000 for the entire buildings. The following extract from the prospectus will give an idea of the proposed plan of construction:

"The simple form and uniform construction of the buildings are advantageous for economy in construction. The material proposed is economical to an extraordinary degree, compared with the imposing governmental and other constructions of the present time. It is a sand and Portland cement concrete, such as was used in the construction of the hotel Casa Monica, in St. Augustine (there with a small fraction of 'coquina' or shell); and especially as used in the Pompeia at Saratoga Springs, on the exterior wall, for the pavement and in the interior for columns. It has been employed sufficiently to demonstrate its great solidity and strength, its increasing hardness beyond any natural stone, its resistance to cold at 16 degrees below zero, its capability to receive any required tint in color, and its cheapness against brickwork. This use of concrete has lately been familiar in cities for pavements which are exposed to the most severe action of frost. In its adoption we are returning not only to the examples of the ancients, but of modern Europe, where dwellings, bridges, and aqueducts are entirely built thereof."

The educational value of an institution of this kind is unquestionable—the architecture, archaeology and the home life of the nations of antiquity and the middle ages will be brought forward in a wonderfully realistic manner. The gain would be great from an æsthetic point of view and the establishment of an institution of this kind would appeal particularly to the traveled and the cultured. The field is open to America to eliminate by reproduction from all the gathered material of the ages precisely what is wanted for a grand representation of the past and the present, and in its advocacy the enlightened press of this country has a cause worthy of its moral power, and in its aid wealth for its noblest use. The offices of the Propaganda for the National Gallery are located at 1419 F Street, Washington, D. C.

\* Illustrated and described in SUPPLEMENT, No. 775.

## Recent Decisions Relating to Patents.

## ISSUE OF LETTERS.

The issuance of a patent to two persons, as joint inventors, constitutes *prima facie* proof that the invention was joint. 1.

Under Rev. St. § 4,896, which provides that, if an inventor dies before a patent is granted him, the right of applying for and obtaining a patent shall vest in his personal representatives, a patent issued to an inventor after his death, he having died after making application for such patent, is void. 2.

## REISSUE OF LETTERS.

A reissue whose purpose is to enlarge the claims of the original, to be valid, must be for the same invention, and must show due diligence in discovering the mistake in the original, the lapse of two years being ordinarily taken as an abandonment of the new matter to the public. 3.

The claim of the original Topliff and Ely patent, No. 123,079, was for "separate rock rods, secured directly to the front and rear axles, to cause both ends of each spring to yield simultaneously." April 9, 1872, it was reissued, so as to claim "separate connecting rods secured directly to the hind axle and front bolster," etc. *Held*, that the reissue was valid, being allowed within four months, for the correction of a mistake which was obvious, since attaching the connecting rod to the front axle would prevent the axle being turned. 4.

The second reissue of this patent, granted March 28, 1876, is valid, as it is for the same invention, though the claim includes the side springs, and was applied for within two months from the first reissue, and before any rights of third persons had attached. 5.

## PATENTABILITY—OPERATIVE DEVICE.

Letters patent No. 336,043, issued February 9, 1886, to Percival Everett, claims: "A weighing machine, having an aperture for receiving a coin, a weighted lever, a dial, and index hand, and intermediate mechanism connected with the same, and whereby the coin, when deposited in the receiver, shall operate the lever, and cause the hand to indicate the weight of the person or body being weighed." *Held*, that the claim is for the machine as a whole, having the parts mentioned, and as the patent refers to all parts necessary to make it complete and operative, the claim is to be read with reference to such known and described parts, and therefore covers an operative machine. 6.

## NOVELTY.

Letters patent No. 336,458, to Vincent L. Ellbert, for an improvement in an apparatus for manufacturing water gas, describe, in claim 1, the combination of a combustion chamber, a superheater chamber, an arch located between the two, and provided with a series of legs forming separate passages leading from the combustion chamber to the superheater chamber, and a series of oil pipes opening through the outer wall of the cupola into the separate passages between the legs of the arch, substantially as described. *Held*, that this claim is void for want of novelty, in view of the prior state of the art, as shown by patents 253,120, 257,100, and 263,984, issued to Theodore G. Springer, January 31, April 25, and September 5, 1882, respectively, and by the "Jumbo cupola" used by the West Side Works, at Chicago, from 1883 to 1888. 7.

The first two claims of letters patent 345,186, issued July 6, 1886, to David F. Stauffer, for apparatus for treating unbaked bretzels, containing as elements the generator, the perforated pipe leading from near the bottom of the generator, a perforated spray pipe, and a casing located over the carrier, all of which elements, each operating in the same way and for analogous purposes, being shown in prior patents, and no new or better results being obtained, are void for want of novelty. 8.

Letters patent No. 323,162, issued July 28, 1885, to Emmet G. Latta, covering, in claims 2 and 3, a pedal bar coated with rubber, longitudinally grooved, so as to furnish two bearing surfaces on opposite sides of the groove, show no novelty over the English patents to Harrison (July, 1877) and to Jackson (January, 1876). 9.

1. Page Woven Wire Fence Co. v. Land, 49 Federal, 936.
2. De la Vergne Ref. Mfg. Co. v. Featherstone, 49 Federal, 916.
3. Topliff v. Topliff, 12 Supreme Court, 825.
4. Topliff v. Topliff, 12 Supreme Court, 825.
5. Topliff v. Topliff, 12 Supreme Court, 825.
6. Am. Auto. Weighing Mach. Co. v. Blauvelt, 50 Federal, 213.
7. Ellbert v. St. Paul Gas Light Co., 50 Federal, 205.
8. Stauffer v. Spangler, 50 Federal, 84.
9. Pope Mfg. Co. v. Gormully & Jeffery Mfg. Co., 12 Supreme Court, 637.

THE idea of using beet juices in steam boilers instead of water has again attracted some attention in Belgium. The juices are heated to 248° F., at which temperature there is no danger of sugar inversion. Steam obtained is used in regular way about the factory. The thickened juice is subsequently reduced to a sirup in triple effect.