

THE TEXAS RAIN MAKING EXPERIMENTS.

Nearly all the accounts of the recent rain making experiments in Texas appear to have emanated from, or to have been inspired by, persons who took part in the performances. These reports were, in most instances, grossly exaggerated, and, in some cases, wholly destitute of truth. It is refreshing, therefore, to find a published account which bears evidence of independence in its statements and freedom from the control of interested persons.

It is understood that an attempt will be made to induce the present Congress to appropriate more money to carry out another series of these foolish fireworks. For the enlightenment of our law-givers and the entertainment of readers, we give the following illustrated account, for which we are indebted to the *Texas Farm and Ranch*:

Did any of the metropolitan papers, excepting *Texas Farm and Ranch*, of Dallas, and *Farm Implement News*, of Chicago, send a special reporter to the scene of Gen. Dyrenforth's rain making experiments near Midland? This question is asked because numerous papers throughout Texas are circulating reports of these experiments which are directly opposite to the facts as given by *Texas Farm and Ranch* and the *Farm Implement News*. These so-called experiments were made under the supervision of the government and paid for by

accurate and complete than those published in any other paper in or out of Texas, excepting the local papers in the territory surrounding this expensive farce.

an honest effort or boom a theory. This matter of rain making is not one that concerns a few individuals or a party of scientists only, but is one of great public concern, involving in its successful solution giant possibilities for a country capable of sustaining millions of people. The first report of the party's operations appeared in the *Chicago Herald* and other papers about August 13, and gave details of a grand success on the 10th with balloons, kites, and dynamite, which "was followed by a rain of six hours' duration, breaking a drought of many months." The writer was on the ground on the 14th, and the balloons had not been unpacked, and on that day Prof. Rosell began combining the powders, and Prof. Meyer began loading the canisters which were to be used in generating the oxygen gas. The same day Gen. Dyrenforth stated that the hydrogen tanks would not hold water, and that it would be one or two days before they could be used. The writer examined the tanks, and their condition was as stated by Gen. Dyrenforth.

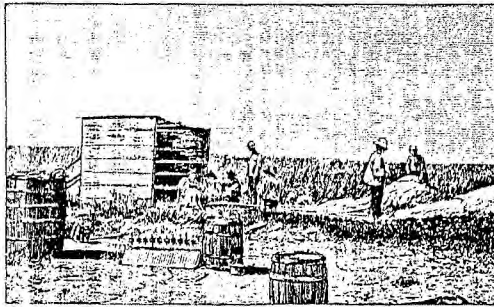


Fig. 1.—INFLATING A BALLOON.

*Texas Farm and Ranch* aims at reliability, and its readers will sustain its reputation in this regard. It could have no possible reason for misrepresenting the rain makers. Its representative was treated in the most gentlemanly manner by Gen. Dyrenforth and the other gentlemen of the party, as well as by Mr. Rey-

ner after the arrival of Gen. Dyrenforth's party was on the 13th, before any experiment had been made. This writer was so informed by Prof. Rosell and others, and he heard Gen. Dyrenforth make the same statement. But the reporter was not deterred by these facts from reporting a "heavy rain at the ranch in response to the party's efforts." The first

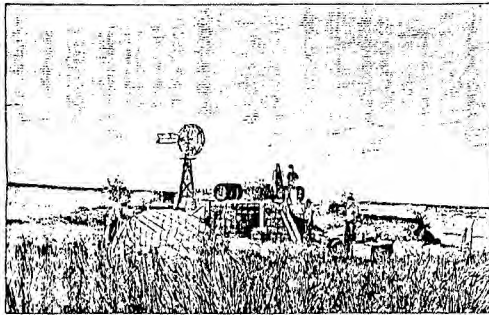


Fig. 2.—BALLOON PARTLY FILLED.

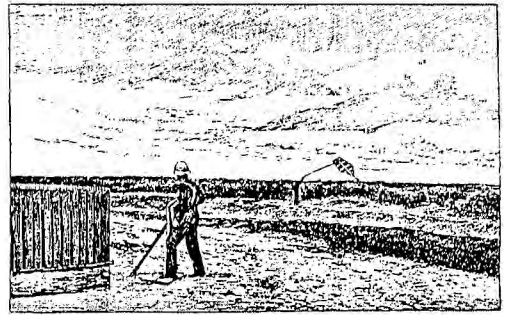


Fig. 3.—KITE FLYING EXPERIMENT.

the people, and the people are entitled to reliable information regarding them.

In order to settle the matter, *Texas Farm and Ranch* will pay one hundred dollars reward for proof that the reports published by it and the *Farm Implement News* were not true in every essential statement, and more

holds, manager of the ranch. He is especially indebted to Prof. Rosell for much information relating to the work of the party, and for theories and opinions on the subject of artificial rain making.

The representative of *Texas Farm and Ranch* was sent to the seat of war to gather facts, and not to ride

attempt to inflate a balloon was made about the 16th. The writer was not present, but was informed on his arrival on the 20th that one of the gasoline furnaces exploded, and that the balloon did not fill satisfactorily, but eventually went up and was exploded by means of a time fuse attached by Prof.



1. Gen. Jan. T. Ellis. 2. Statistician. 3. Paul Draper, Electrician. 4. Gen. R. G. Dyrenforth. 5. Prof. Carl Meyer, Balloonist. 6. Prof. G. E. Curtis, Meteorologist. 7. Prof. Rosell, Chemist. 8. J. R. Oaker, Aviator. 9. Prof. Powers, Author. The others are cowboys.

THE RAIN MAKERS IN TEXAS.

Rosell. This explosion, which was reported as "beyond the conception of a person who has never been near heavy artillery in action," was unnoticed by the cowboys on the ranch half a mile away. The writer made inquiries of them and gathered this information.

The writer arrived at Midland (his second visit) on the 20th. That day a heavy rain was reported over a large area. These are the facts: Heavy, dark clouds appeared in the northwest; the explosives were made ready, and several charges fired; the clouds swerved to the west, and rain fell along the Pecos River, nearly one hundred miles west. On the plains none fell, and at the C ranch it remained dry and dusty. This was made the occasion for another sensational special, declaring another signal success. The fact is, the clouds came up and threatened rain before any explosives were used, and afterward the clouds departed for the trans-Pecos region. These facts are given partly from observation and partly from information obtained from members of the rain making party.

The following was telegraphed to the *Chicago Tribune* about August 21:

"The government rainfall expedition, under charge of General Dyrnforth, reached Midland August 5, and has maintained a continual skirmish during the last two weeks with more or less vigorous actions at intervals. During these operations there have been repeated showers and two storms, during which large quantities of rain fell. The first experiment was made August 10, and was followed by a heavy rain, which broke a drought of long duration. This operation consisted of firing a number of bombs loaded with a high explosive, which is prepared on the spot by the experimenters. The bombs were placed on high ground and exploded by means of electricity. On the succeeding days large quantities of dynamite, 'rackarack' blasting powder, and oxy-hydrogen gas were exploded, partly on the ground and partly at heights ranging from a few feet to a mile and a half, the explosives being hung from mesquite brush and poles, suspended from large kites, or contained in balloons and exploded by means of electricity or with time fuses or dynamite caps."

This is refreshing reading to people who were on the ground and heard nothing of it. It is probably true that more atmospheric concussion was made by the jack rabbit hunters in the vicinity in one day than was caused by the combined efforts of the rain makers. Moreover, in the presence of *Texas Barn and Ranch's* representative, the party claimed to have sent up only one balloon previous to August 22, which was more than two weeks after their arrival on the ground. That is the balloon which ascended on Sunday, the 10th, four days previous to the rain which occurred one hundred miles farther west.

On the 22d another attempt was made to inflate balloons, on account of the bursting of the oxygen canisters. Progress was extremely slow.

Illustration No. 1 was taken at 3 P. M., after six hours' work, and shows one balloon containing a small quantity of oxygen, and General Dyrnforth and Professor Rosell at the furnace in the boardly shanty wondering what is the reason the apparatus won't work. It also shows the balloonist carefully rolling up a balloon which the experience of the day has shown will not be needed, while the statistician stands by with his hands in his pockets, wondering, probably, how long it will be at the present rate of progress before he will need an umbrella.

Illustration No. 2 is the same scene taken at 6:30 P. M., from the opposite side of the field, and shows the same balloon receiving its charge of hydrogen and about two-thirds full. It also shows Professor Meyer spreading a net over the balloon to prevent its escape, while Mr. Horton, a merchant of Midland, and the representative of *Texas Barn and Ranch* are standing on one of the hydrogen tanks regarding the slow evolution of events, and getting tired. The rest of the rain making party are discussing a basket of Mission grapes and the refractory acts of the oxygen apparatus at the shanty to the right, which is not shown in the cut.

Illustration No. 3 shows one of the many fruitless attempts to fly kites with sufficient tail. It shows Professor Meyer, kite expert, paying out the cord, while the kite is making a vigorous plunge for the earth. The kite shown in the cut is an electrical kite, and the writer was informed by Professor Rosell that it eventually ascended and conveyed electric sparks (not rain) from the clouds to the earth. The writer witnessed on attempt by Professor Meyer to fly a kite. The kite was about six feet wide and the tail consisted of a single strip of cotton umbriac about an inch and a half wide and ten or twelve foot long. It would be useless to tell a ten year old school boy that it would not fly with so slim a tail. At the time this attempt was made Professor Rosell called the writer's attention to some kite wreckage a few yards distant, the debris of previous unsuccessful efforts.

Illustration 4 shows the personnel of the party, with the manager of the ranch and some cowboys grouped on the porch of the ranch headquarters.

The writer left the ranch at 8:30 P. M. The balloon, which had been slowly absorbing gas all day, was not yet ready to ascend, and the writer left for Midland.

When about half way an explosion was heard. Was it the balloon? That it was was a reasonable inference, which was accordingly entertained. A prominent citizen of Midland, who was on the ground, called on the writer a few days later and assured him that his inference was at fault, that the balloon was held captive for a few days and it with two others were sent up. If any of these exploded, according to the programme, it had been kept a secret from the public ear; that two of them took fire and were destroyed by slow combustion, and one sailed away intact and was found a few days later some ten or twelve miles from the place of departure.

On the morning of the 23d, between 1 and 3 o'clock, a dry norther swept the plains with a shower of dust and sand. Some explosives had been discharged in the early part of the night and the imaginative reporter claimed "another success scored by the rain makers." This storm was announced by the United States signal service eleven hours before at Omaha, ten hours before at Atchison and about six hours before at Kansas City.

#### QUOTATIONS AND COMMENTS.

A special was sent out announcing that in the presence of about fifty witnesses four or five explosions were made, and on each occasion copious showers followed in from ten to forty seconds. Professor Rosell's statement made to the writer was substantially as follows: A dark cloud came up, and when overhead a charge was exploded, and in a few seconds a few drops of rain fell. Soon after another cloud was passing over and a light sprinkle was falling; another charge was fired, and the rainfall perceptibly increased a few seconds later. In case of a conflict of testimony between the reporter and the professor, the writer may be excused for giving credence to the latter.

C. K. Kloburg, of Corpus Christi, visited the rain makers after Gen. Dyrnforth's departure, and had an interview with Mr. Ellis, who was in charge. Col. Kloburg was informed, among other things, that Gen. Dyrnforth had expended the government appropriation and \$2,000 of his own money. In the special Washington correspondence of the *Dallas News*, Gen. Dyrnforth is quoted as follows:

"After the experience in Texas, I think the venture unquestionably promises success. The cost has not been enormous. All, or all but some inconsiderable parts of my apparatus is manufactured, and I have spent less than one-half the government's appropriation, \$7,000. Every natural condition was against me. We went to a quarter of Texas where the wind blows at such a rate that operating our balloon was like reasoning with a lunatic or arguing with a bucking broncho. We had to build tanks in which to form the gas, and after doing this one of them burst and had to be rebuilt."

"It has been said that atmospheric conditions worked with us. This is directly opposite to the truth. All but four of our first experiments were made with a rising barometer. The cowboys, who know ten times more about the subject than those special advisory agents of Providence on weather matters, our bureau officials, to a man declared for fair weather. The night of our last experiment the weather was so notoriously fixed to be fair that one cowboy took me aside as a friend and urged me not to try that night. He said I had done so well up to the present time it was a pity to dim the luster of my glory with a final failure, and he thought I would better just declare the date postponed. But for all this friendly counsel I went ahead. We fired from 8 to 11 o'clock that night, and at 4 o'clock in the morning I arose from the floor, where I was sleeping on camp feathers, in response to claps of thunder. 'The storm was on us and the rainfall great.'

"I have been given the lie for saying that those rains were the first to fall in that country for three years. This is because every reporter I have talked to has seen fit to neglect to quote me as saying the first grass rain. By grass rain I mean a continued rain that makes the grass grow. Besides this, we have made dew, something unknown here. Go out in the early morning, your boots are covered with dew. The ground is so red hot the moisture in the air does not condense upon it any more than it does upon a cook stove. On the contrary, a body of hot air is constantly arising to repel the clouds that may approach. After the ground was thoroughly cooled by the rain, dew formed, and I am satisfied that it is only a question of time when we shall transform these arid plains into wet regions."

In the matter of expense there seems to have been a misunderstanding between Gen. Dyrnforth and his subordinate, Mr. Ellis.

Gen. Dyrnforth states above that, under the circumstances surrounding him, "operating our balloons was like reasoning with a lunatic or arguing with a bucking broncho." In this the writer agrees fully with the general, and no words that he could summon to his aid could more forcibly and truthfully express the absolute verity of the case. The efforts of the party to inflate, send up and explode balloons were no more successful than reasoning with the parties referred to. In this the general fully confirms all *Texas Barn and Ranch* has published regarding the balloons.

In the above interview, if correctly quoted, Gen.

Dyrnforth assigns to the cowboys more knowledge of the weather than "those special advisory agents of Providence on weather matters, our bureau officials," and yet those ignorant and unscientific bureau officials predicted the rains which Gen. Dyrnforth claims as his from six to twelve hours before their arrival, and before the general's explosives were made ready to produce them. Gen. Dyrnforth corrects his reporter in one particular. He did not say that he produced "the first rain that had fallen in that country for three years," but "the first grass rain." Now it is a matter of record that beginning the night of August 25, 1890—just one year before—the heaviest rain fell in that section that has been known before, during or since Gen. Dyrnforth's arrival, washing out culverts and delaying trains on the Texas & Pacific railway nearly two days, and that rain extended from the C ranch to El Paso and beyond. The general claims that he has exceeded his most sanguine expectations in that he has "made dew here—something unknown here." The "meteorologist" of the party should have instructed Gen. Dyrnforth that on the plains, as elsewhere, dew falls only when the temperature and relative humidity are at the dew point, and that in dry seasons, dew falls in response to conditions produced by rain which may fall elsewhere, and that neither with nor without the proper meteorological conditions can (ten; Dyrnforth nor any one else "make dew" save and except the same Almighty power which is supposed to have created rain makers.

In regard to the temperature of the plains, Gen. Dyrnforth does not agree with the common experience of the inhabitants and visitors. The truth is the climate is delightful, and notwithstanding the generally cloudless sky and brilliant sun, the heat is not the least oppressive. Travelers can comfortably wear a coat the hottest day in summer. This writer traveled the road from Midland to the ranch several times during the stay of the rain makers—the very hottest part of the summer—in company with several others, but few of whom removed their coats. The summer climate of the Staked Plains, with the single exception of its sand storms, is the most delightful on the continent. For the truth of this statement we refer to any unbiased person familiar with the facts.

#### An American Electric Railway in England.

The first overhead electric train line in England was opened in Leeds on October 29. Hitherto such objections have been raised to the unfitness of such lines that, in spite of their obvious economy, all previous attempts at electric traction in Great Britain have been either on the conduit central rail or storage battery system. The new line has been fitted up by the Thomson-Houston Company. The maximum grades are 1 in 20 and 1 in 21 each for a distance of one quarter mile, while another grade of 1 in 20 is three quarters of a mile long. The power station, which is a temporary structure 85 feet by 36 feet in area, contains two Thomson-Houston 80 horse power dynamos, with the usual fittings. The engines are of the single cylinder high speed type, and are supplied with steam from a Babcock & Wilcox boiler. The trolley is carried on standards 21 feet high, from which the current is drawn off to the motors on the cars through a small grooved wheel, which is pressed against the under side of this bar, and runs along it as the car progresses. The return current from the car passes through the wheels to the rails and the return wires. Each car is fitted with two 15 h. p. motors.

#### The Trade Rats of Arizona.

A miner near the Senator recently had a rather singular experience with trade rats, known also as mountain rats. As the nights were cold the miner took his ore sack to replenish his rather hard bed. Having neglected to come to town for several weeks, his supply of beans had given out, and he had come down to a diet of stunted bacon. Considerably out of humor, he started in to pull his bed to pieces one morning, and in removing the sacks was agreeably surprised to find three pounds of beans, with a little coffee mixed, which the trade rats had brought from the Senator and stored in his bed.

The rats are native Americans, and very different from their imported Norway cousins. They are called trade rats because they generally leave some article in exchange for what they take away.

The miner states that he never killed a trade rat; that those rodents habitually steal from one cabin and carry their plunder into an adjoining one; that on one occasion he spilled a couple of quarts of corn on the floor of his cabin and the next morning found the rats had stored away every grain of it in a pair of saddle bags hanging upon the wall.

He also states that the rats have thick caudal appendages, about three inches in length, which they keep constantly throwing up and down, striking the floor with each downward movement with the regular measured stroke of a musical professor marking time. They carry off plugs of tobacco, tooth brushes, combs, and brushes, in fact, anything which they can manage to move.—*Prescott Courier*.

CARRYING A LIFE LINE ASHORE BY A KITE.

Over weeks since, on two different occasions, experiments were made on some islands in the East Sea, near New York City, to test a new method of carrying a life line ashore from a vessel in distress, as represented in the accompanying illustration. The kite, however, were not made from a vessel actually at sea, as portrayed by the artist, but the kite was a strip of water five-eighths of a mile wide, in which the current was running at the rate of two and a half miles an hour.

The kite used in the experiment was made with three sticks, each 7 feet long by 1/2 of an inch thick, their tapering from 1 1/2 inches at the center to 1/2 inch at the ends. The weight of sticks and bolt is 3 1/2 lbs. The kite is foldable and can be made into a package of convenient shape. To make ready

it is only necessary to unroll the sticks and fasten strings to the ends of two of them, the covering already tied to the ends of one stick while the other is used for the covering, and the tail is made of the fine knotted in

the kite is designed to carry wind up to fifty feet, having a motor of seven in a row, the breakers of the six bridle

in such a wind still being a safety factor of one and a half. In sending the kite the three bridle

sticks of each side are fastened to a single line, and these lines leading to separate reels, provided with a brake and ratchet, when in the detail view,

means of the cords from the reels the kite can be held at an angle to the wind, so that it can be carried in a direction up to the wind on each side

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[FOR THE SCIENTIFIC AMERICAN.] The Bessemer Steel Discovery.

Mr. Bessemer was a very learned metallurgist, and was seeking a short and cheaper way of producing steel from cast iron by reducing the excess of carbon. His process was to force air through the molten mass and burn out the excess of carbon and such base minerals or metals as it contained, and stop the blast at the proper time and thereby save the expense and labor at the puddling furnace; but there was no way to effect uniformity or to ascertain just when to stop.

One day in his experiments a very happy thought struck him, which was to burn out all of the carbon, or as near all as possible, and then restore a proper quantity of carbon by pouring in a very high grade of iron and as free as possible from base materials injurious to steel. This he found in certain qualities of ore called spiegel or "spiegelstein." His first experiment

ground that it was not new, and yet I was told when in Essen, at Mr. Krupp's works, that Mr. Fried. Krupp paid Mr. Bessemer \$50,000 to go to Essen and teach them the method. Krupp had already spent considerable money and time in trying to make Bessemer steel and failed to do so.

Mr. Bessemer in 1869 was said to have amassed a fortune of about twenty millions from his invention, and it was said then to be the largest amount ever made by any one inventor, and probably was.

The John Brown works were then the largest Bessemer steel works in the world, and I went there to see about twenty tons converted at one time. A two hundred horse power engine was used at the blast furnace alone, and it was indeed very interesting to see the immense converting pot poured full of molten iron, and then the blast turned on, and see it boil and intensify with the varied colors as each base ingredient

was destroyed by the heat, and when all was consumed except the quite pure iron, then the molten spiegel was poured in, and the affinity of the molten mass was so great that one could see its greedy appetite for the carbon, like a hungry swine for its swill. I was told that Mr. Bessemer for a long time anticipated the making of steel by his process equal to the best cast steel, but in this he of course failed. Still, while I was in Sheffield I was at a steel rolling mill where they used the *scrap*, as they are called, that come out of the converting pot. These were broken up, remelted, and a small mixture of better material used and melted together and poured into ingots, and that rolled into sheet metal and crosscut and pit saws made of it for the Russian market; and I was told that over six hundred thousand of them were sold there every year, besides saws made from it were sold all over the world. If there is any cheap method of producing anything of metal, England is among the first to adopt it. An immense amount of work that is done in America by men is done there by poor women for a mere pittance that will keep soul and body of part of them together; but when sickness comes or their job is lost, it is the pauper house or the grave. No American can ever appreciate the glories of our free and liberal country and government until he goes to foreign lands.

J. E. EMERSON.

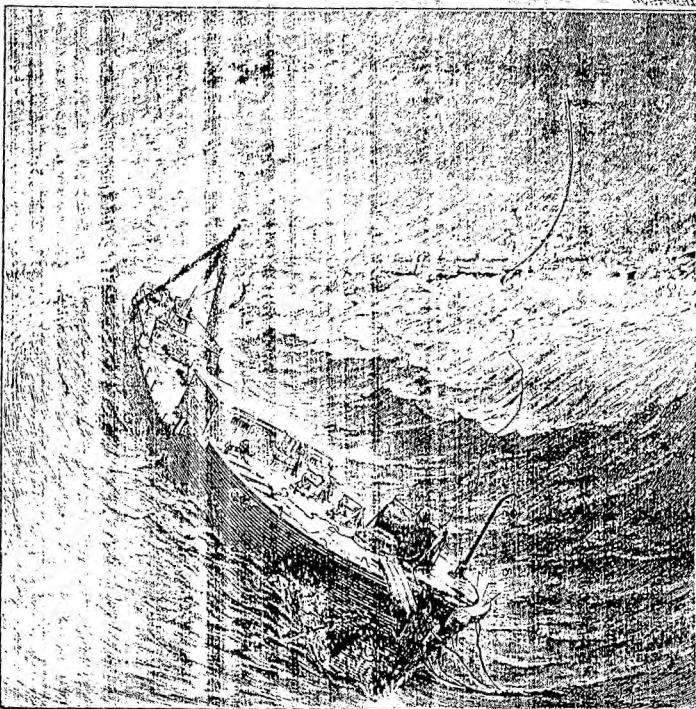
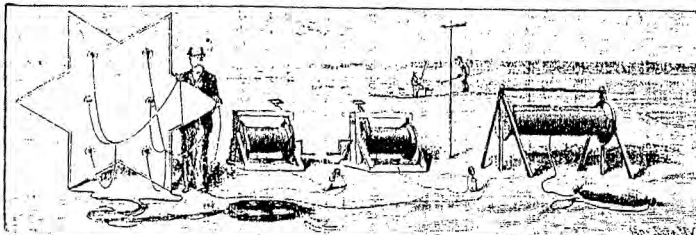
Photography of Inks.

Dr. Jeserich claims it is possible to demonstrate differences in the colors of the inks which cannot be seen, the one ink appearing

light and the other dark. This process depends on the following considerations:

As is well known, the tints of the inks that are called black are either brown, red, green, or blue in shade. Such tones have but little effect on the eye, as it is chiefly sensitive to the yellow and red rays, but the chief sensitiveness of photographic plates, on the other hand, lies in the blue, violet, and ultra-violet. As, with ordinary sensitive plates, yellow and green subjects are rendered dark, and blue ones light, the same will follow in photographing inks of various tones. This difference can be considerably intensified by the use of suitably colored light and color-sensitive plates. In this manner marked differences in the various inks can be clearly and distinctly demonstrated.

Among the subjects with which the author deals is the application of photography to the detection of the falsification of handwriting. In such cases photographs can be of great service, as in an enlarged photograph picture erasures and alterations can be seen than in the original.



DAVIS' METHOD OF CARRYING A LIFE LINE ASHORE BY A KITE.

proved quite successful, but here he found a stumbling block. Some man had patented the method of melting wrought iron and restoring it to steel by supplying it with molten spiegel, and he was quite successful except that the metal must go through the puddling process, and then the remelting added another cost, which made it quite as expensive as to convert wrought bars into blister steel, then melt it in the crucible and pour it into ingots in the usual way. Under the English patent laws there must be an annuity paid after a certain number of years or the patent becomes invalid. The inventor of this process of melting wrought iron and restoring it with spiegel was in Mr. Bessemer's way, but in a short time, unless he paid the government installment on his patent, it would become invalid. So Mr. Bessemer watched the records until the poor unfortunate let it run out, then Mr. Bessemer that same day entered his claim, and his patent was granted, covering the entire process. I learned these facts in 1869 while at the John Brown Bessemer Steel Works, in Sheffield, England. But when Mr. Bessemer applied for a patent in Germany, it was refused on the

patent for this improvement has been applied for by J. Woolfbridge Davis, of No. 645 Madison Avenue, New York City.

COMPOSITION was caused in all technical circles in 1886, Congo red heralded the many-colored dye that class of dyestuffs which dye cotton with fast colors that is direct. Like the fuchsine discovered by A. W. von Hofmann in 1858, and the first essentially true product by Grube and Liebermann in 1859, Martignier's Congo red was a red dyestuff of the marking stone of a new period in the development of the far dyestuff industry at the same time of the dyeing industry.