WE CAN HAVE A NAVY IN THE AIR

Offered Prize of $100,000 Has Brought Out a Wonderful New Man-of-War That Sails the Sky.

INVENTIONS SHORTLY TO BE SPRUNG UPON THE PUBLIC

This Combats Maxim's Theory That a Ship Will Never Fly on Wings Until an Engine Walks on Legs.

RISES BY BALLOON ATTACHMENT FROM VESSEL IN MID-OCEAN

Owner a Carpet-Bag Inventor, But Those Who Went to Laugh Remained to Wonder at His Genius.

Since the introduction into the Senate of a bill by Henry Cabot Lodge, offering prizes for machines that will fly, the activity in aerial navigation has been unprecedented. Never since the Marquise de Bacque, in 1742, tried to fly and fell upon his barge, breaking his leg, "in an indignity and unbrainly attempt to penetrate into the regions inhabited by God and the angels," has so much been going on to reach into the domains of space.

Leonardo da Vinci, in the middle ages, tried repeated flying-machines, owning up to what we would now call a "flad" for them, but never with great success. The argument presenting itself to the minds of all who are trying to fly is this:

"Overhead is a great body of wind possessing force enough to remove houses and impede the progress of steam locomotives. Why is it not possible for me to utilize this force to some extent? Why can I not rise by means of it, and remain aloft as long as I please? Why can I not move along with it and through it? Why am I not able to turn this great power to my own uses?"

And this same problem is the one that has been puzzling minds longer than the telegraph puzzled them; and it is for the speedy solution of it that Senator Cabot Lodge offered his bill giving prizes to the first inventor who would solve the secrets that govern flying machines.

UP LIKE A ROCKET.

There have been many flying machines built. And successful ones, too. They would mount into the air and soar as high as desired. But that was the end of their accomplishments. When the flyer wanted to descend he could not do so at will. He was borne along as far as the wind wanted to play with him, just as a kite would be. In vain he tried and wrestled with the wings of the machine. The more he tried the further he flew.

Suddenly the wings would turn, in obedience to his repeated tugs upon them, and down he would come like a stick from the sky. His own weight and the weight of the machine would drop him to the earth with a force considerable enough to crush him, and when rescued from an ignominious heap upon the ground there would be an assorted mass of broken up man and flying machine. Broken wings, broken legs, dislocated shoulders and demoralized ribs were all there was to show for the aerial triumph.

The drop had been too much for the experimenter and his machine. The result was much as if he had tied a stone around his neck and jumped out of a fifth story window. That practically is the history of flying machines, with a few exceptions in the cases of ingenious persons who have been skilful enough to keep their balance and wait for the wind before trying to get to the ground. But the practice and the skill necessary to accomplish this result utterly unfitted the machine for general use.

The late activity among those who have partly learned to fly is bringing to light some very odd contrivances designed to sail the air and triumphantly capture the $100,000 prize. If the money were lying upon the ground like a sheep off guard, and the flying machine were an eagle soaring the air above, the money could not seem easier to grasp than it now does to the inventors. Each and all are sure of it.

One of the latest of the inventors is a man who stole into a certain large city a few days ago with a carpet satchel in one hand and a shawl strap in the other. He wore a suit of plain gray, and though his tile was not the latest spring creation, he was well enough dressed to show that he had money and that his machine had not been built on brain alone.

Inside a few weeks this worthy gentleman has had more visitors calling at his little hall room than had ever penetrated that peaceful residential neighborhood in so short a time before. The visitors were not inventors by any means, but gentlemen of note, whose opinion and influence would be powerful factors for the young machine to own. The visitors came by invitation and promised to keep the professor's address a secret, but one who visited him thus describes his invention:

"The plan of Prof. Blank is to sail the air with a combination of flying machine and air-ship. The invention can be called either. As it goes by steam and carries men and guns, it can be called a ship. The wings, however, give it the birdlike appearance of the flying machine.

"This machine is a bold one because it combats the theories of that great war inventor, Hiram Maxim. Maxim says that a flying machine will never navigate the air by wings. He holds that it is ridiculous to suppose it will. Maxim says an air-ship will never fly on wings any more than a locomotive will walk on four legs like a horse.

"He, however, holds differently. And his machine is planned to actually combat Maxim's idea. He considers that a locomotive might be made to walk on legs like a horse, if no more speed than a horse's speed were expected of it. He asks for greater speed than that of a bird at. fore, wings will propel the machine as fast as he expects it to go.

TAKING A FORT.

"The object of the professor's air-ship is utility in the war. This, really, is the object of the introduction of the Lodge bill in the Senate. With so much smoke rising from the countries of the world there may be a spark coming to the surface at any time. In the conflagration the United States would be sure to take part either directly or on the defensive.

"Whatever her warlike policy might be, or her policy for peace, it would be important that she should be thoroughly posted upon the operations of the rest of the world, and what more useful than a flying ship that could rise in the air, sight troubles, telegraph them to land by wires, or by use of signals, and stay aloft until the globe was pretty well looked over. This is what this air-ship could do.

"But this particular air-ship has another use, and that is part of the secret of its construction.

"In the middle of the ship, which is shaped like a high whale, there lies a large light cavern. This is weighted heavily with all kinds of ammunition. In the bottom and sides of the cavern are port holes through which great guns can be fired upon fortifications below.

"The actual plan of the machine is to rise from a ship in mid ocean, if a fortress is to be attacked, and to sail toward it. When near enough to fire the guns could be levelled at the fortress with design either to shatter or terrify the soldiers away. Once abandoned, the signal could be given for our warships to approach. Their work of beating back the enemy and effecting a landing would be much simplified.

"This plan of taking a fortress, theoretically, is much more approved by soldiers than the one of taking it with warships. And for this reason:

"Suppose the fortress stands upon the most prominent point of a rocky or uneven coast occupied entirely by another country. Let us for argument suppose it were desired to capture Quebec. Our warships could of course approach it and fire upon the nearest fort. But suppose they captured it, would they not then be badly off? The walls of the fort would have been shattered by the firing, and the first acts of the soldiers would have to be to throw up fortifications to protect themselves from attack in a hostile country.

"With the air-ship the fort could be taken without shattering a wall. The warship hovering overhead and sending down an occasional volley would terrify the men. They would see the folly of firing up in the air, and would abandon the fort, and the man-of-war could approach and land her regiment. There would be less destruction, and less loss of life, a thousand fold, than by a forcible landing, with the ships being beaten back and fired upon at every advancing step.

RISE FROM A LEVEL.

"This is a very fine theory, and the professor with the big air-ship model says he has made it practicable. His machine has overcome three of the greatest difficulties of the air-ship.

"First, it mounts from a level surface. This is a feat hitherto almost unaccomplished. One of the greatest aeronautical societies of America limits its prizes to such machines as can start not over 100 feet higher than the place of alighting. This is to prevent the starting from a tower and gradually descending ground, as so many machines can now do.

"The way this difficulty is overcome is by means of a large air cell in the top of the body of the whale-like structure. This great hollow compartment lightens the upper part and prevents the ship from turning over, and it also is fitted in such a way that it catches the whole force of the wind. The sides open toward whichever way the wind is blowing, and an immense current can be put on from the wind alone.

"In addition to this the professor has a very ingenious arrangement, something on the balloon principle, by means of which he manages to rise from the ground anywhere. When in the air this is cut loose and allowed to sail away. With each flight one of these balloon affairs must be sacrificed, but the cost is small compared to final savings.

"The second difficulty overcome is that of steering. This is done by 'p'intin' her nose to the wind,' as an old sailor remarked who saw the little model floating around a room. There are ways of shutting off the air on one side of her nose and letting it in on the other side, for there is a great hollow for the pilot to occupy. And this, with a similar manipulation of the 'tail,' causes the air-ship to revolve or partly revolve or move in any desired direction.

ITS WINGS.

"The great spreading wings are to keep the ship up in the air. Their resistance is something mighty. When fully spread they lie over hundreds of feet of atmosphere; and, if found necessary, more sails can be run up and spread out upon the great network of wire until the sky will lie full of flat white sails resting apparently against the heavens. Considering the weight which a large kite will lift from the ground, the sails will be more than ample to hold up the thousand pounds which the air-ship will weigh, with its pilot, gunner, ammunition and all. Three men can entirely operate the air-ship. And, allowing the inventor's calculation of 160 pounds each, there will be over 500 pounds left for the air-ship and its ammunition. Of this, 100 pounds ought to be ample for ammunition, as few volleys will be needed and the remaining weight is in machine. With its many air compartments this is ample. Should the ammunition give out, what easier than to descend for more!

"And that brings us to the third hare difficulty mastered by the inventor, the work of coming down to the ground in the right way without overturning or dropping with force enough to hurt machine or man. This he accomplishes by pumping the air out of his air-cells.

"It is on the same principle as the torpedo boat. In the torpedo boat you rise to the surface by pumping water out of the water chambers, thus lightening the torpedo enough to rise to the surface. You fall by letting water in to make the torpedo boat heavy enough to go down.

"In the air-ship you are dealing with another element, that of air. And you fall by pumping air out of the air-ship. It is like a balloon when you let the air out of it. It falls to the ground. The great extra sails, lying flat against the sky, are hauled in, and only the smaller ones left for the descent. The plan is to navigate the air-ship to a point directly over where you want to descend, and then to let the air out, take in the top sails, and gradually come down. The position of the side wings must not be changed. It is in shifting this position of the side wings that inventors get their great falls.

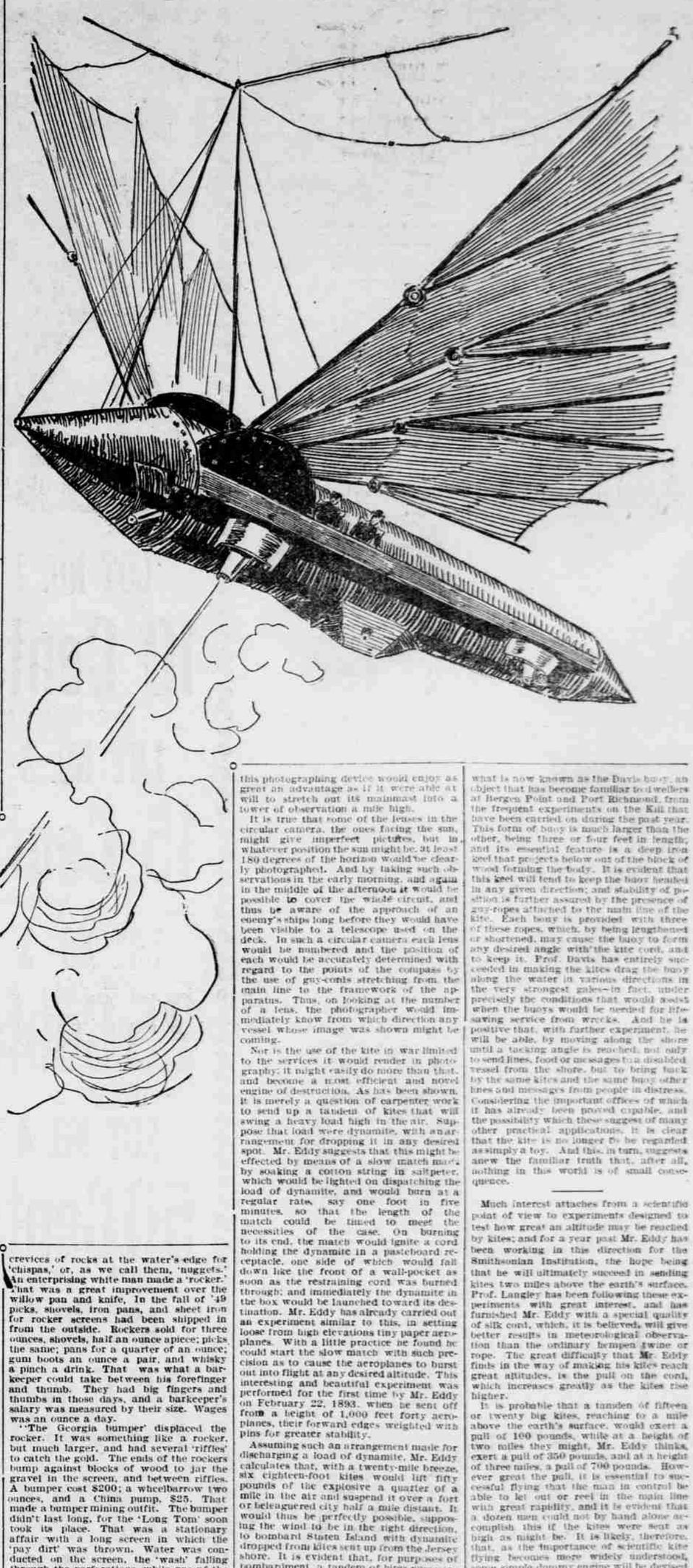
GETTING DOWN AGAIN.

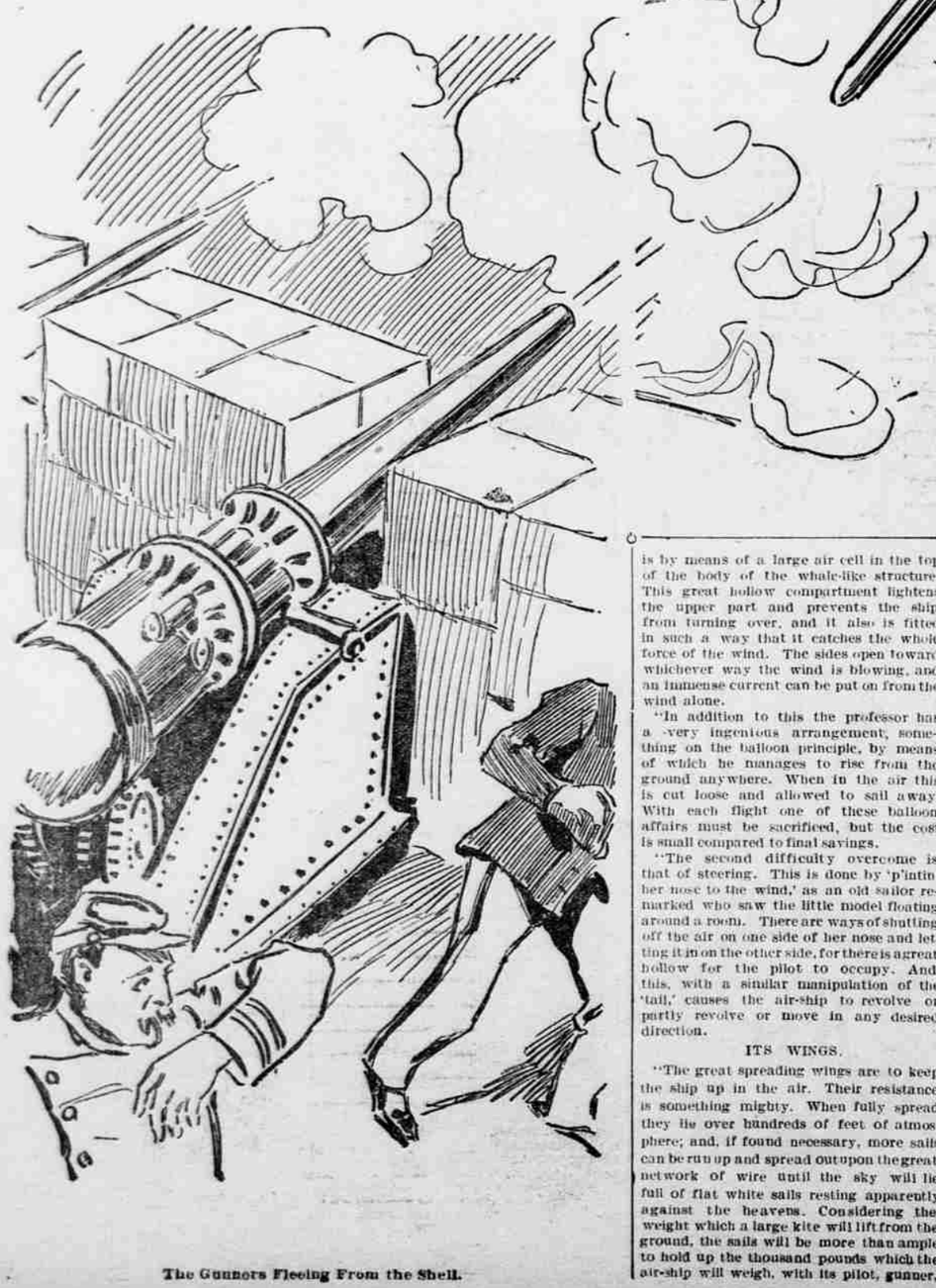
"As soon as those wings are turned so they cut the air like a bird's wing the ship drops like a stone. Unlike a bird the ship cannot change the position of its wings in a single second, and before they can be righted again there has been an awful drop. This point mastered and the inventor feels he has the happy solution of air-ships.

"There is a steam plant aboard the air-ship. This can produce an onward propelling motion. It can also heat the air for the operators, should the air above be full of snow or icy sleet. This steam will give a warm atmosphere to the flying ship, and enable it to discharge its duties no matter what the weather above may be. It need not be used unless desired. It is only a small steam plant, and cannot mar the machine, even if it does no good.

"It must be confessed that the machine as it stands, though complete, is open to some questions or doubts. But what new invention was not? Everybody remembers when trolleys and cables were thought of with doubts and fears; and nearly every grown-up person recalls the doubts with which the telephone and its live wires were thought of in connection with family use in one's home. This air-ship, while wonderful, is no more remarkable than those."

There are many other air-ships now being built. The inventors will tell nothing about the direct mechanical arrangements, as each hopes for the reward of $100,000. But to friends who do not invent they give little private exhibitions.





The Gunners Fleeing From the Shell.

So there is no doubt whatever that by January 1, 1901—the time limit appointed—there will be successful flying machines.

Nothing angers an inventor like being found out, and that is the reason of the stillness in flying-machine circles.

Maxim is so conscientious that he will not allow hostile nations to approach him for inventions to fight his own country; and when the United States rewards one of its sons for producing so powerful an implement as this will be in warfare, it will take pains to patent itself against foreign encroachments.

JAMES BARTON.

EARLY MINING ON THE COAST.

Barkeeper's Pay Gauged by the Size of His Finger and Thumb.

Butte (Mont.) Inter-Mountain.

Gathered in and around Butte are men who have mined in almost every country under the sun, but although charming conversationalists in the society of their friends for some unaccountable reason they become suddenly dumb when approached by a newspaper man. It was a reporter's luck yesterday to run against one who talked in an interesting way. He was large, rather fine-looking, apparently about seventy years of age, and a man who had watched with close interest the progress of mining on the Pacific coast since the historic days of '49.

"Yes, I was out in California in the old days," he replied to a question, and then added with a pleasant smile, "I was thar from '49 to '89 and took all the courses, from pan to little giant and from hand-made black powder cartridges to dinnymite.

"When gold was discovered by Marshall in that tail race Sutter was digging for his sawmill at Coloma, not a man in that country knew a thing about mining. Never heard how they knew it was gold, hey? Well, there has been a great many stories told about it, but here is the right one. It was a little nugget Marshall picked up, worth three or four dollars. Each one of the gang looked at it, bit it, tasted it, rubbed it, smelled it, but none of them had a clear idea what it was. Several thought it might be gold, but none was sure of it. A happy thought struck Marshall. Mrs. Weber boarded the hands. She was making soft soap from pine ashes lye. Marshall pro- the lady should boil the nugget in lye a day or two, and if it didn't change color or lose its substance in the test it was sure-enough gold. Well, it stood the test. The world knows the rest.

"Among the first on the ground was a lot of greasers, a cross between Mexicans and a lower class of humans. God knows they were all low enough, but the cross was no improvement on the general run of the cattle. The greaser brought his willow-made pan and knife as his mining tools. He cut and scraped among the crevices of rocks at the water's edge for 'chispas,' or, as we call them, 'nuggets.' An enterprising white man made a 'rocker.' That was a great improvement over the willow pan and knife. In the fall of '49 picks, shovels, iron pans, and sheet iron for rocker screens had been shipped in from the outside. Rockers sold for three ounces, shovels, half an ounce apiece; picks the same; pans for a quarter of an ounce; gum boots an ounce a pair, and whisky a pinch a drink. That was what a barkeeper could take between his forefinger and thumb. They had big fingers and thumbs in those days, and a barkeeper's salary was measured by their size. Wages was an ounce a day.

"The Georgia bumper' displaced the rocker. It was something like a rocker, but much larger, and had several 'riffles' to catch the gold. The ends of the rockers bump against blocks of wood to jar the gravel in the screen, and between riffles. A bumper cost $200; a wheelbarrow two ounces, and a China pump, $25. That made a bumper mining outfit. The bumper didn't last long, for the 'Long Tom' soon took its place. That was a stationary affair with a long screen in which the 'pay dirt' was thrown. Water was conducted on the screen, the 'wash' falling through the perforations, while one of the hands forked out the rocks or small stones.

"A sluice or two were added to the Tom. These, as well as the Tom, were supplied with riffles, which generally caught about all the dust. Long Toms were first used in Nevada City in 1850. Improvements in modes of placer mining rapidly followed. Sets of sluices without the Toms were used; then ground sluicing came next and hydraulic mining, where water and fall could be obtained, displaced the rocker, bumper and Tom. Hydraulic mining is an old thing now."

"How about underground mining?" inquired the reporter.

"Gold-bearing quartz was first discovered by some miners in the bed of Deer Creek, below Nevada City, in the summer of 1850. It was found in a narrow vein, but the discovery led to the opening up of the magnificent gold-bearing quartz mines of Grass Valley in Nevada county. All the equipments of the mines were at first crude, but the mines were rich and paid well. Black powder was used in blasting where blasting was necessary. Some years after nitro-glycerine was introduced in the State, but an explosion of the stuff in a San Francisco express office knocked it out, and giant powder came into use. You know the rest."

USE OF KITES IN WAR.

Experiments in Discharging Dynamite and Taking Observations.

Cleveland Moffett in March McClure's.

It is obvious that kite photographs might be of great value in time of war, since a detailed view of an enemy's lines and fortifications might be thus obtained; while at sea a perfected kite photographing apparatus might be of great value in recording the approach of an enemy's ships. Mr. Eddy regards it as perfectly possible to send up a tandem of kites from the deck of a man-of-war, with a circular camera, such as has already been devised, attached to the main line, and an apparatus for snapping all the shutters simultaneously; and photograph, not only the whole horizon as seen from the deck of a vessel, but, because of the greater elevation, many miles beyond. A battleship provided with this photographing device would enjoy as great an advantage as if it were able at will to stretch out its mainmast into a tower of observation a mile high.

It is true that some of the lenses in the circular camera, the ones facing the sun, might give imperfect pictures, but in whatever position the sun might be, at least 180 degrees of the horizon would be clearly photographed. And by taking such observations in the early morning, and again in the middle of the afternoon it would be possible to cover the whole circuit, and thus be aware of the approach of an enemy's ships long before they would have been visible to a telescope used on the deck. In such a circular camera each lens would be numbered and the position of each would be accurately determined with regard to the points of the compass by the use of guy-cords stretching from the main line to the framework of the apparatus. Thus, on looking at the number of a lens, the photographer would immediately know from which direction any vessel whose image was shown might be coming.

Nor is the use of the kite in war limited to the services it would render in photography; it might easily do more than that, and become a most efficient and novel engine of destruction. As has been shown, it is merely a question of carpenter work to send up a tandem of kites that will swing a heavy load high in the air. Suppose that load were dynamite, with a mechanical arrangement for dropping it in any desired spot. Mr. Eddy suggests that this might be effected by means of a slow match made by soaking a cotton string in saltpeter, which would be lighted on dispatching the load of dynamite, and would burn at a regular rate, say one foot in five minutes, so that the length of the match could be timed to meet the necessities of the case. On burning to its end, the match would ignite a cord holding the dynamite in a pasteboard receptacle, one side of which would fall down like the front of a wall-pocket as soon as the restraining cord was burned through; and immediately the dynamite in the box would be launched toward its destination. Mr. Eddy has already carried out an experiment similar to this, in setting loose from high elevations tiny paper aeroplanes. With a little practice he found he could start the slow match with such precision as to cause the aeroplanes to burst out into flight at any desired altitude. This interesting and beautiful experiment was performed for the first time by Mr. Eddy on February 22, 1893, when he sent off from a height of 1,000 feet forty aeroplanes, their forward edges weighted with pins for greater stability.

Assuming such an arrangement made for discharging a load of dynamite, Mr. Eddy calculates that, with a twenty-mile breeze, six eighteen-foot kites would lift fifty pounds of the explosive a quarter of a mile in the air and suspend it over a fort or beleaguered city half a mile distant. It would thus be perfectly possible, supposing the wind to be in the right direction, to bombard Staten Island with dynamite dropped from kites sent up from the Jersey shore. It is evident that, for purposes of bombardment, a tandem of kites possesses several advantages over the war balloon. Kites are much cheaper. Then it would be far more difficult to disable them than to disable a balloon, since they offer a smaller mark to the enemy's guns; and even if one or two were destroyed, the others would still suffice to carry the dynamite. Finally, the kites may be sent up without risk to the lives of those who directed them, which is not the case with the balloons.

Another interesting and important application of the modern kite has been conceived by Prof. J. Woodbridge Davis, principal of the Woodbridge Boys' School, in New York, who is one of the most famous kite flyers in the world, in addition to being a distinguished scientist and mathematician. It was Prof. Davis who invented the dirigible kite several years ago, three strings allowing the operator to steer the kite from right to left at will or to make it sink to the earth. Having perfected this curious kite, which is of hexagon shape, is covered with oiled silk, is foldable, portable, and has a tail, Prof. Davis turned his attention to his more recent and important discovery of the dirigible buoy, which bids fair to do much to lessen the dangers of shipwreck. For months past Prof. Davis, assisted by Mr. Eddy, has been experimenting on the Kill von Kull with this buoy, and has obtained most encouraging results. There are two kinds, both being designed to be attached to kite lines and drawn over the water by the power of the kite. The simpler variety is merely a long wooden tube about three inches in diameter, and shaped very much like a gun projectile, with a cone of tin dragging behind to give steadiness. It is for use only when the wind is blowing in exactly the direction in which it is designed to send a message or carry a rope. It will be observed that in a large number of cases when ships are driven on rocks the wind is blowing toward the shore, and in such cases a line of kites would readily carry one of these buoys ashore with the important words inside or the still more important rope following after.

Not satisfied, however, with this buoy, Prof. Davis sought some means of making kites draw a load across the water in any direction desired, regardless of the way the wind might be blowing; and, after much thought and calculation, he hit upon what is now known as the Davis buoy, an object that has become familiar to wellers at Bergen Point and Port Richmond, from the frequent experiments on the Kill that have been carried on during the past year. This form of buoy is much larger than the other, being three or four feet in length, and its essential feature is a deep iron keel that projects below out of the block of wood forming the body. It is evident that this keel will tend to keep the buoy headed in any given direction; and stability of position is further assured by the presence of guy-ropes attached to the main line of the kite. Each buoy is provided with three of these ropes, which, by being lengthened or shortened, may cause the buoy to form any desired angle with the kite cord, and to keep it. Prof. Davis has entirely succeeded in making the kites drag the buoy along the water in various directions in the very strongest gales—in fact, under precisely the conditions that would assist when the buoys would be needed for life-saving service from wrecks. And he is positive that, with further experiment, he will be able, by moving along the shore until a tacking angle is reached, not only to send lines, food or messages to a disabled vessel from the shore, but to bring back by the same kites and the same buoy other lines and messages from people in distress. Considering the important offices of which it has already been proved capable, and the possibility which these suggest of many other practical applications, it is clear that the kite is no longer to be regarded as simply a toy. And this, in turn, suggests anew the familiar truth that, after all, nothing in this world is of small consequence.

Much interest attaches from a scientific point of view to experiments designed to test how great an altitude may be reached by kites; and for a year past Mr. Eddy has been working in this direction for the Smithsonian Institution, the hope being that he will ultimately succeed in sending kites two miles above the earth's surface. Prof. Langley has been following these experiments with great interest, and has furnished Mr. Eddy with a special quality of silk cord, which, it is believed, will give better results in meteorological observation than the ordinary hempen twine or rope. The great difficulty that Mr. Eddy finds in the way of making his kites reach great altitudes, is the pull on the cord, which increases greatly as the kites rise higher.

It is probable that a tandem of fifteen or twenty big kites, reaching to a mile above the earth's surface, would exert a pull of 100 pounds, while at a height of two miles they might, Mr. Eddy thinks, exert a pull of 350 pounds, and at a height of three miles, a pull of 700 pounds. However great the pull, it is essential to successful flying that the man in control be able to let out or reel in the main line with great rapidity, and it is evident that a dozen men could not by hand alone accomplish this if the kites were sent as high as might be. It is likely, therefore, that, as the importance of scientific kite flying becomes more widely understood, some simple dummy engine will be devised for rapidly turning the windlass on which the main line is wound.

Mr. Eddy has made frequent experiments with rain-kites, which he used for the first time in November, 1893. It is true that Franklin sent up a flyer during a shower, but in his case the rain was merely an accident accompanying the electric storm, which was his only concern. Mr. Eddy, however, has sent up kites in the rain for the purpose of studying cloud altitudes and other meteorological phenomena; and by this means he has discovered what was not previously believed to be true that clouds sometimes sink to within six hundred feet of the earth's surface without actually coming down to it.

In fact, Mr. Eddy has had kites disappear in a cloud at a height of only five hundred and sixty-eight feet. It has sometimes happened that clouds settling toward the earth have obscured the kites gradually, the top one becoming invisible first, and then the others in succession. Mr. Eddy has found that by such indications he is able to foretell the approach of fog four or five hours before it reaches the earth's surface, so slowly do the clouds settle through the air strata.

One Naturalist.

A man who has made a careful study of the habits of animals and birds, and who firmly believes that birds think and are controlled by brain action in a great measure—about, if not quite as much as human beings, and not by the "overrated instinct"—told a few nights ago of the odd effect natural history had on him.

"Do you know," he said, "that since I learned that birds and mammals think, I have had a fort of spleen against flesh? When I eat a partridge I think of the bird's wiles used in its endeavors to escape the hunter's merciless shot. It is the same with the ducks, turkeys, deer, and beeves, and all other flesh, but not fish. I have the dread, or feeling, that I am eating a rational being. I think that if vegetarianism ever becomes universal it will be when we understand the thoughts of birds and mammals and are able to converse with them. We are just now entering on a wonderful field of research. We have found the door to real natural history knowledge, and we are now groping for the keyhole."—New York Sun.