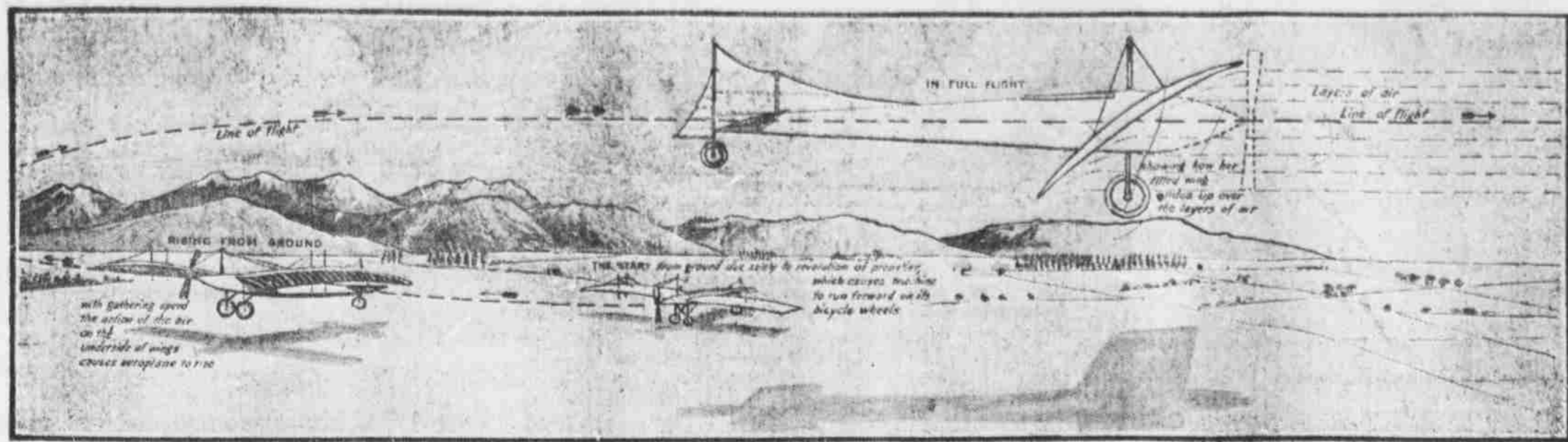


# HOW AND WHY THE AEROPLANE FLIES



MANNER IN WHICH THE AIR SUPPORTS THE AEROPLANE, SHOWN DIAGRAMMATICALLY IN THREE STAGES—ON THE GROUND, LEAVING THE GROUND AND IN FLIGHT.

The difficulty of keeping on a straw hat when motoring or driving may help to illustrate the first principle of governing the aeroplane, says the London Sphere. Setting out on a calm day, it will be found that the current of air rushing against one's hat increases with the speed of the car, and further, it will be noted that the tendency of this horizontal current of air is to lift the hat upward of one's head. The rim of the hat is usually tilted at a slight angle, and it is in effect a kind of aeroplane. The greater the speed at which it is moved through the air the greater is the uplifting pressure of the air against it. This upward reaction of the air gives support to every flying machine. Experimenters first designed gliding machines of light weight and with large bearing surfaces, and to gain the necessary support from the air they leaped off hills or ran down inclines. When the proper speed was attained the machine rose in the air. Thus gliding was accomplished. Be it noted that for gliding machines man has departed from the bird type with flapping wings. The gliders and the glider aeroplanes have fixed planes.

But it was soon found that these glides could only be of short duration, for the forward speed of the machine rapidly declined, and thus the upward supporting pressure of the air diminished. In the same way, when the speed of the motor car declined there would be less difficulty in keeping one's straw hat on. It was obvious that there should be an artificial propelling force to keep up the velocity of the machine. This idea was tested with models by shooting them from catapults and other devices, and is still employed for toys and demonstration purposes. A bullet shot from a gun is also in effect a flying machine, the enormous velocity imparted to it enabling it to make a long flight through the air.

As continuous velocity was essential, it soon became evident, however, that the best way of maintaining the velocity of a flying body was to have this propulsive power provided on board of the vessel itself. Experiments made with the propellers mounted on motor cars showed that a good speed could be obtained from a vehicle running on the road by fitting it with aerial propellers. Acting on the air, the screws move the whole apparatus forward just as a ship's propellers drive it through water. Airship propellers could thus be tested for their efficiency by use on road vehicles, and the method well illustrates the suitability of the air as a medium in which to use propellers.

The last stage was to obtain the gliding machine, mount an engine on this, and set it to drive one or more propellers. The action of the screw was to force the machine along the ground first, and then as speed increased and air resistance grew greater, the whole apparatus would be lifted bodily off the ground, provided the upward air pressure was able to overcome the downward pressure due to the weight of the apparatus. As long as a certain minimum speed is obtained and a certain minimum air pressure kept up the vessel will move in the air, always controlled by two main forces—the downward pull due to gravity and the upward thrust due to the reaction of the air against which the machine is forced. The balance and control of the machine in the air, the action of varying wind currents, etc., are other important factors, however, which govern the machine in the treacherous aerial sea.

The methods of control on the various machines show many differences, but the main functions are much the same. The essentials are:

1. Control of upward and downward steering.
2. Control of side steering.
3. Control of the engine.
4. Balancing.

Lever and pedals are generally employed, but in some cases wheels serve to govern the various organs, and pedals are used in a few instances also. In the biplanes the rudder or elevator for up and down steering is placed in front, whilst in the monoplanes it is usually in the rear. The rudders for steering from side to side are generally at the rear. In the Wright machine they are coupled up with the balancing device which warps the main planes. Machines of the Voisin type are not provided with balancing devices worked by the driver, as they have automatic stabilizers in the shape of a box tall and vertical side panels between the main planes. Most of the monoplanes have balancing devices under the driver's control.

Engine control very often merely consists of a device for cutting off the ignition and thus stopping the engine. This, in many cases, takes the form of a wire or loop near the aviator's hand, so that he can instantly stop the motor.

## SOME CHANGES DURING ONE HUNDRED YEARS

Domestic Duties Have Been Wonderfully Lightened in the Past Century.

### SKILL OF OLD-TIME MATRONS.

Our Grandmothers Were Capable of Doing Everything, from Making Candles to Spinning Silk.

To-day the whirl of a thousand looms hum in a spot that once echoed to the treadle of one. The man who sheared his sheep, and his wife who carded and spun and wove the wool, are asleep on yonder hill. The carders have fallen into rust, the spinning wheel is silent. Another generation wears woolen garments woven into shape by knitting mills, and fine linens and silks that have come from power looms in mammoth factories. What if the thread is more brittle and the color less enduring than fingers in the past were wont to spin and dye? Fair and fine and frail are the lilies of to-day. The woman who wears them thrusts rosemary out of sight with her last season's gowns. She does not want the things that endure.

The woman who by the pressure of an electric button illuminates almost an entire house seldom recalls the method which her grandmother employed for furnishing light to her household by means of candles fashioned by her own hands. She, perhaps, was able to procure beef tallow and wax from the beehives stocked with bees more for the purpose of supplying comb than honey—then so largely used in place of sugar. But her mother, doubtless, depended upon the tallow shrub, bayberry bush and candleberry tree to furnish a meager quantity of waxy substance which she might boil to a stiff consistency and into which her row of candle wicks might be dipped.

The innumerable inventions to simplify work in the kitchen, and which to do practically everything except consume the food, are considered indispensable by the modern housewife, but would have been gazed upon with wondering awe by the housewife of a hundred years ago, who thought herself lucky indeed if she owned a Dutch oven in which to bake her cakes and bread, and a twisting string, clock jack or turnspit dog to keep her roast revolving before the fire.

### Things Women Did 100 Years Ago.

A hundred years have wrought as many changes in other respects. The belle of to-day who numbers her toilet soaps and face powders and creams by the score can scarcely realize that her grandmother made a preparation of starch or eggshells and cologne as a face powder, and collected grease and manufactured lye of wood and ashes, with which to boil soap for household purposes, some of which was refined for personal usage. Nor do the families who respond to the call of soft chimes or an announcing butler at the dinner hour think upon the time when their ancestors were summoned by the sound of a drum, a horn, a gun, an iron triangle or a loudly blown conchshell.

In the long ago women had few spare hours for idleness, for reading or amusement. There were stockings to knit, undergarments to stitch, rugs to braid and weave, jellies and fruits, pickles and preserves to put up in season. Knitting mills have relieved tolling fingers of the labor of constructing stockings and underwear; rugs and carpets are wrought cheaply in factories, embroidery is done by machinery, and if a housewife prefers to continue canning vegetables and fruits for her table the work is made light for her by porcelain lined preserving kettles, air tight, rubber sealed jars, and patent lifters, holders and sealers for filling and sealing the jars with boiling hot fruit with a rapidity that makes it possible to put up fifty jars of fruit, with less effort than our grandmothers expended to preserve five.

### PIE EATING SNAKE.



On entering the pantry of Mrs. Louis Longbrake near Findlay, Ohio, Mrs. George Young was horrified to see a big snake swallowing a pie that had just been set there to cool. Her screams were heard by men who were near, and they killed the snake.

### THE UP-TO-DATE HOUSEKEEPER.

Is not conservative about trying new Methods. Saves her time and strength whenever she can. Brings business principles to running her house. Believes in modern conveniences, and will make sacrifice to own them. Makes it her business to know prices, qualities and quantities, so is not easily fooled in running expenses.

## FASHIONS OF OLD RETURN.

Mode That Ruled in the '70s Influence the Styles of To-Day. Curious as it may seem, the predominant influences at work among the new styles are those borrowed from the fashions of the 1870s and '80s, says Mrs. Clara E. Simcox in the *Delineator*. I say "curious" because there could hardly be an uglier, more impossible period for the designer to draw on than those awful '70s. You remember the little tight-fitting, narrow-chested basques, the bouffant draperies over the hips, the scant underskirts and the foolish bits of lace and ribbon, of fringes and headwork, that passed for true elegance in those unenlightened days?

Yet, with all their flagrant disregard of the laws of simplicity and restraint and beauty, they have furnished us with the basis for some really lovely things. The fishwife skirt and the lavenue tunic, which were truly terrible when hips were huge and waists were wasplike, are positively charming in combination with the present silhouette. The overskirt is caught up across the front and allowed to trail downward toward the back, quite as it used to do thirty years ago. The underskirt is generally plaited, but instead of the formidable array of organ-pipe plaits that used to delight the eye of our mothers and grandmothers, we content ourselves with a simple kilted skirt that falls in straight flat lines around the feet.

I saw a great many on the other side with the underskirt of one material and the fishwife tunic of another. They are especially good for the semi-dressy trotteur—a street toilet that can be worn between seasons without a wrap. It is a youthful-looking style, and one that promises to have an immense vogue. Abroad they are being made in serge, in bouffant—another name for whipcord—in a new diagonal worsted that is known as Alma Victoria, in wool crepe, flannel and cashmere. The retromne tunic, as it is called, is really a welcome innovation among the gowns of the serge category, for the plain narrow skirt in a heavy material has rather the effect of a blanket on women who have succeeded in eliminating their hips.

### Frozen.

Running water is usually the last thing to freeze solid, and when it does so the cold must be extreme. J. Claude White, in the *Wide World Magazine*, gives the following description of this very rare occurrence—the freezing of a mountain torrent in a single night.

The phenomenon was one that I have never before experienced—a running river frozen solid in a night! When we arrived the waters of this stream, tumbling over the great boulders and rushing through the tortuous channels, made a deafening roar. Gradually, but almost imperceptibly, the tumult decreased, while, row after row, we fell asleep. A few hours later, when we awoke, a deathly silence prevailed, and looking out, to my intense surprise, I found that the rushing torrent of the previous night had been transformed into a solid mass of ice! In this region of extreme temperatures I had on other occasions seen torrents frozen, but never under such startling conditions. On looking round we found that everything we possessed was also frozen solid, including our saddle of mutton, which was merely a block of ice. We were ravenous, but we got no satisfaction from gnawing at lumps of rock which ought to have been a succulent joint, and, so, despite our hunger, we had to content ourselves with a little tea—to make which we melted ice—and a few biscuits.

### Bound to Get the Shoe.

The ingenuity which the lady in this story from *The Bits* displayed might more profitably be exercised in inventing a new sort of gift for the popular favorites.

The curate had just arrived. He was young, handsome and single, and consequently very popular with the ladies of the parish, whose appreciation took the usual form of worked slippers. Recently the following episode occurred:

Fair Caller—You see, I wanted to make Mr. Chasuble a pair of slippers, and I thought you might lend me one of his old shoes to get the size.

Curate's Landlady—Law, miss, the shoes is all a-given out four days ago! And it was only yesterday mornin' a lady as had heard his shoes was all bespoken came here a-imploving of me to let her measure the wet footmarks in the reverend gentleman's bathroom immediately he had gone out.

### Bought by King George in 1771.

The old house standing on the corner of Batavia and Roosevelt streets, New York, one of the best buildings left intact as a relic of colonial times, is about to be torn down to make way for an apartment house. The house, a bit altered, has been standing since the middle of the eighteenth century. It is one of the landmarks of the Fourth Ward. In the year 1771 King George III. bought the house and property for the sum of £75. The deed of sale, with the signature of the king attached, is now in the possession of the present owner, Thomas Farrell, of 72 West 137th street. An option on the property has been given for about \$100,000.

### The Size She Wanted.

A woman went into a bookstore, says a writer in the *New York Times*, and asked for a globe. The clerk showed her several, and turned them on their pivots, so that the pink and blue countries could be seen to best advantage. "What size do you want?" he asked. "I think, said the woman, "that you may give me one life size."

### No Chance to Learn.

Closet—You don't know the value of money. Mrs. Closet—I think I would learn if I only had some—Illustrated Bits. Anyway, there's no danger of an idiot's dying of water on the brain. The man who figures in an explosion begins at the bottom and goes up.

# How Much Money Can a Woman Spend?



**H**OW much money can a woman spend? We dare anybody to give us a few millions of dollars and let us find out, writes Mme. Qui Vive in the *Chicago Record-Herald*. How much money is a woman likely to spend? All that she doesn't have, and saving isn't her particular specialty or profession. Is it important that she shall spend \$40,000 a year on silks, feathers, toilet covers of gold and bronze, silk bonnets and ribbons run through? It may be important, but to most of us it's not true. Mrs. Howard Gould says that she requires \$10,000 a month, or \$120,000 a year, in order to live decently as bella lady of fashion. The news of it rather dazed some who have dashed about in grand style and much fashion on \$9 a week, and put money in the bank during the dashing.

If it were not for the women coin-fingers, what would become of this great country of ours, anyway? There would be no need of tariff discussions and the infant industries would die from lack of nourishment. How many male shoppers invade the big department stores? A few timid, mouselike

creatures, who scurry to the neckwear department and out again or who venture into the maelstrom of skirts and parasols to purchase an occasional pair of purple sunset socks. If women didn't spend money the merchant would be a rare curiosity to be seen only in the dime museum.

The small items are the ones that count up the fastest and count for practically nothing. When a woman gets a hat mad on and flutters into a millinery-shop to go insane for an hour or two, there's no limit to the number of hats she may select. As long as she keeps from fainting she can continue to pick out, even though her hair net may fall by the wayside and her false puffs give up the ghost. At a fashionable milliner's establishment few hats are listed under \$40. A single plume may cost \$200. A woman can spend \$1,000 for skypieces without great fatigue of mind or body. And if she has a fortune she frequently does it.

When it comes to jewelry, there is of course no end to the outpouring of gold. Diamonds and pearls, filigree and emeralds, rubies and turquoise all cost real money of large denomination.

For veils and hosiery, handkerchiefs

and gloves a woman can spend a fortune every year. A pair of corsets of good make will cost \$25 and no corset is considered fit to wear after a month or six weeks—that is, by the coin-distributor who loves to let the money fly away or fly by, as the case may be. Handkerchiefs must be edged with real lace, gloves must be of the finest quality and discarded instead of cleaned, hosiery must never be worn after a toe has pecked through or a heel has developed little windows. Undergarments must be handmade, trimmed with real lace edge or done with finest hand embroidery. Negligee flutters and frills can be most expensive, and dressing robes and kimono are no trifling matter.

Mrs. Howard Gould isn't the only woman of extravagant tastes. There are others, and we hear about them frequently. Miss Giulia Morosini, the New York girl of prominence, says that she cannot dress well on less than \$200,000 a year. It was a common report that she spent half that amount for gowns for the horse show one year.

Mrs. Russell Sage is another money finger. It is said that her husband earned \$5,000 a day, and she has been giving money away at the rate of \$5,000 a day, going him \$2,000 better. In one year she donated \$14,000 to charity. At the death of her husband Mrs. Sage was estimated to be worth \$100,000,000. The Gould family controls \$80,000,000. Mrs. Hetty Green's fortune ranges between \$50,000,000 and \$80,000,000.

Once again: How much money can a woman spend? The reply to the problem is: First show us the woman. There are Katherine Goulds and there are Hetty Greens, the spend-thrifts and the misers. What would bring joy to Mrs. Gould would create misery in the thrifty soul of Het. The talent of one is to waste and the ability of the other is to save.

Few women can say how much money a woman can spend. The majority have never had a chance to find out. Perhaps it is just as well since the genuine supreme ecstasy of extravagance is to buy something you don't need when you cannot possibly afford it. Yes?

The use of chlorine in the proportion of five parts to one million, according to the Geological Survey, will practically disinfect ordinary sewage.

The tungsten incandescent lamp is the first artificial light by which all colors can be distinguished.

A horse census of England, conducted by the government, revealed that, while the number was not decreasing, there was an alarming lack of animals of suitable types.

Electricity has replaced mules as the motive power on the street railroads of Santos, the Brazilian city from which so much coffee is exported.

A novel potato digger invented by an Indiana man loads the tubers by an endless chain into the wagon to which the machine is attached.

## GUNNER BLOWN TO PIECES AT A CANNON'S MOUTH.

Standing in front of an old-fashioned brass cannon, ramming the wadding down, Paul Paulson, a member of the Escanaba division of the Michigan State naval reserves, was literally blown from the muzzle of the gun when the charge exploded prematurely. The reserves had been called out to attend a celebration given in honor of the organization of the Grangers in that section and were about to fire an honorary salute to Mayor Rose, of Milwaukee, the principal speaker of the day, when the accident occurred. Fully 10,000 people were in attendance when the tragedy occurred and at least 1,000 of them were eyewitnesses to the death of young Paulson. So interested did the farmers become in the work of loading the old-fashioned piece that they crowded in among the gun crew and hampered them in their work. Several times they were ordered back, but without avail. The work of inserting the fuse and priming powder brought many of them so close to the breach of the weapon that they crowded about the wheels and powder boxes. Paulson was at the



muzzle ramming home the wadding when a criminally careless spectator flicked the ashes from his cigar. There was a tiny puff of flame and smoke as the priming powder blazed, a deafening explosion and the frightened hundreds saw the gunner fall beneath the cloud of dense white smoke.

### HARRIMAN EPIGRAMS.

I have worked hard because I like the doings of things. As I grow older I am beginning to think more of my fellowman. It has always seemed wiser to me to sleep on the roof than in the basement. To achieve what the world calls success, a man must attend strictly to business and keep a little ahead of the times.

Success is the accomplishment of any one task as well or better than the same task can be accomplished by another. People seem to take more stock in a man who talks than in a man who acts. But this is a day devoted to him, and it will pass. I have always been too busy to think much about myself. The doctors are beginning to tell me that the other fellow ought to have a chance to do something.

Every tide has its rise and fall, and one would be living in a fool's paradise not to take the ebb into consideration in figuring out his future requirements. We have had monkey dinners and the idle and foolish vapors and routs of society. Now is the time for less champagne and truffles and more roast beef and milk.

## KICK SAVES A FARMER'S LIFE.



J. M. Underwood, an Illinois farmer, no doubt owes his life to the presence of mind of A. T. Woodstock, a brakeman on the Chicago, Peoria & St. Louis Railroad. Riding upon the pilot of his engine, which was pulling a fast freight train, Brakeman Woodstock was horrified when he saw the body of a man lying across the rails directly in front of the train as it rounded the curve. Signaling the engineer, who slowed down the train with the emergency brakes, he extended himself forward on the pilot as far as possible, and with his foot shoved Underwood from the track. When the train was stopped Underwood was picked up at the foot of a steep embankment. Other than a painfully bruised shoulder from coming in contact with the brakeman's shoe, Underwood was uninjured. He had missed his train and started to walk home. Becoming tired, Underwood says he sat down on the track to rest, and that is the last he remembers until he came to at the bottom of the embankment.

### LITTLE CURTAIN LECTURES.

"For heaven's sake, my dear, whatever else you do, don't become stingy!" "There's something mighty mysterious about the way you've been acting lately, and I'll get to the bottom of it, mark my words, sir!"

"Do you want me to go out with you looking like a perfect frump and dowdy, or are you going to give me time to dress?"

"I'd like to know, so I would, why it is that some women's husbands are glad to take them everywhere with them, while you are forever making up excuses to get out alone!"

"That's it, you heartless brute—laugh! It just shows how much understanding or appreciation you have of the feelings of a woman!" "Coming home in the car this evening an awfully fine-looking middle-aged man, beautifully groomed, kept staring and staring at me." "I don't want you to be a Willie-boy, of course, but, merciful heavens, that hat makes you look to be a thousand years old!"

Lead pipes may be polished by rubbing them with pulverized pumice on a wet rag until bright, then drying them and applying a coat of white varnish.

Italian contractors and engineers are planning to link Egypt to Syria by a railroad that will be the first to cross the Suez canal.

### ATCHISON GLOBE SIGHTS.

Every cross man is a sick man. The more money a girl has, the less she cares for the men. You can't stuff some people as much that they will be grateful.

There is such a thing as showing injustice in clamoring for justice. Everyone thinks he can tell you what is the trouble with his town.

Every woman gives the idea that her social obligations run her to death.

When a man is asleep, and forgets that he is alive, is his happiest time. Hunting is Greatly Encouraged by the men who have ammunition to sell.

Speaking of great contempt; ever hear a barber discussing safety razors?

Being afraid you will earn more than you are getting is not the way to get more.

If the fools don't control the world, it isn't because they are not in the majority.