FIREWORKS FOR THE FOURTH

THAT fireworks in general are hardly more than highly differentiated firecrackers might be said with almost literal truthfulness, inasmuch as practically all of the pyrotechnic toys employed for the purposes of celebration on the Fourth of July depend primarily upon the paper tube loaded with combustibles of one sort or another, as the fundamental element, so speak, in their construction.

Even the great "set pieces," which might be called fire pictures, and which are erected upon scaffoldings sometimes as much as a hundred feet in length, depend for their effects wholly upon such paper cylinders, no bigger than good-sized firecrackers, stuck all over the lattice work of the skeleton structure employed by the fire-painter in lieu, as one might say, of canvas.

Something more in detail about these fire pictures will be said later on; but meanwhile it may be as well to speak descriptively of the processes used in the manufacture of the more simple and familiar kinds of fireworks—such, for example, as roman candles, bombs, rockets, pinwheels and the like. All of these, excepting the bombs, are substantially nothing more than cylinders of pasteboard, filled with combustibles and fashioned in different ways.

One of the greatest fireworks factories in the world is located on the outskirts of Brooklyn, but the stranger who passes by it on a trolley car on the way to Coney Island would scarcely suspect the character of the outfit, which is scattered over about twenty acres of land in a series of small buildings, some of them being so tiny as to accommodate only a single workman. The object of this arrangement is to minimize the consequences of accidents. If the lone man who occupies any one of the tiny houses should happen to be blown up he alone would suffer.

It naturally happens that the only building of considerable size on the premises is one in which no explosives or other lively combustibles are used. Here, in fact, is where all the paper is stored, tons upon tons of it, for the outer wrappings of the fireworks. Pyrotechnic toys, of course, must be pretty to look at, else they would not sell to advantage and the papers utilized for the purpose are of all colors of the rainbow and a great variety of ornamental patterns. For extra fancy goods more or less gilt and silver paper is employed.

Upstairs in the same building all of the paper cylinders are made, the process adopted being so exceedingly expeditious that one person can turn out as many as 18 gross of them in a day. Of course they are of all lengths and diameters according to kind and size of fireworks for which they are intended and though the rocket cylinders are rolled by machine all of the others are made by hand. With the aid of a long, round stick of metal and a pot of paste the operator converts sheets of thin, brown pasteboard into neat and compact tubes at the rate of three or four a minute.

A dozen work people engaged in this occupation can turn out an immense number of cylinders in a day and the manner in which they are utilized in the manufacture of different kinds of fireworks will presently be explained. It might be well to say incidentally, however, that in this same department are made the bombshells, which are stamped by a machine out of papier-mache in halves. When they have become dry the halves are joined by strips of thin canvas soaked in paste, each sphere thus produced having a round hole at one end for loading.

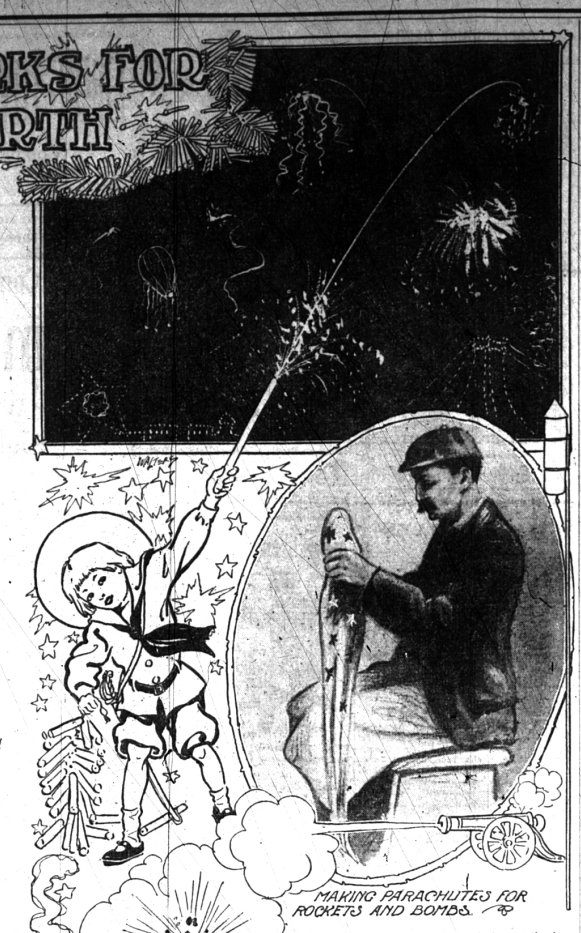
Bombs are among the most interesting and beautiful of fireworks and some of them are of great size—as much as five feet in diameter. They are discharged from mortars and, reaching a height of 1,000 feet or more, explode with a great noise, liberating showers of many-colored stars or golden rain, or sometimes parachutes carrying trains of stars. Some are made as small as two inches in diameter—baby ones, suitable for family use.

The method of their construction is always the same and is at once simple and ingenious. The papier-mache shell is filled with "stars"—that is to say, with little pieces of cylindrical paper tubing packed with different chemical compositions. Beneath the shell thus loaded is attached and firmly glued a paper receptacle containing a slow-burning composition similar to gunpowder. Then a fuse is so fixed that being ignited at the instant of the bomb's discharge it will burn just long enough to explode the shell at the moment when the projectile has reached its greatest height in the air. When this happens the paper shell is blown to pieces and the stars, incidentally ignited, are thrown far and wide. Being light, they fall slowly and the effect produced is very beautiful.

Even the stars, you see, are paper cylinders, though only half an inch perhaps in length. But they vary much in size, according to the uses to which they are to be put. A man cuts them by the millions with a small circular saw, taking a handful of paper tubes of small diameter and using the saw to chop them into short pieces of equal length. Then the little sections are filled with chemical mixtures of various kinds, nitrate and chlorate of baryta being used for green, carbonate of strontium for red, oxylate of soda for yellow and (oddly enough) paris green for blue, with various admixtures of chlorate of potash, shellac, etc.

It should have been said that, in order to strengthen the papier-mache shells and so to enable them to scatter their stars more widely when shattered, they are wound with strong grocer's twine, outside of which the final decorative paper cover is put on. There is, however, another and quite new kind of bomb, which is made in the shape of a cylinder. It is so constructed that during its flight through the air it makes a series of "breaks," sometimes as many as ten, throwing out each time a shower of stars. This, as might be imagined, is a very beautiful effect, and is achieved by dividing the containing cylinder into a series of compartments holding stars, each compartment being set off in its turn.

Some of these cylindrical bombs contain parachutes, which are arranged like the parachutes dropped from rockets. Inside of the pasteboard case is a circular piece of tissue paper, around the circumference of which are attached a series of very long strings. To each of these strings are fastened at intervals a number of the little paper stars already described and the arrangement is such that when the paper disk, which is the parachute, is thrown out of the receptacle it instantly expands and drifts slowly downward, while the ignited stars, dangling along the strings beneath, make an exceedingly pretty display.



The methods adopted in the case of parachute rockets is exactly the same, the parachute and its attachments being packed into the "head" of the rocket. A rocket, of course, consists of two parts, the lower portion being a pasteboard cylinder, made especially thick, containing the explosive that makes the thing go up, while the upper compartment is simply a receptacle to hold stars, parachute, golden rain stuff, or whatever is to be liberated when the projectile has reached its highest point in the air.

What is called a "mine" is a big cylinder of pasteboard, which may be four or five feet high and, which is attached to a square wooden base, in order that it may be stood up. Inside of the cylinder is put a propelling charge of the slow explosive and on top of it a paper bag filled with stars. At the top is an ordinary roman candle, which serves as a sort of spout. When the roman candle is lighted it shoots a few fiery balls successively in the customary manner, and then, the explosive inside having been reached, the whole affair explodes, throwing a multitude of stars in all directions.

Comparatively new are the so-called "batteries" of roman candles, which, in proportion to the number of candles going off simultaneously, produce a brilliant display. "Gerbs" are cylinders filled with iron filings, which are thrown out in an incandescent state by the slow-burning explosive. They are intended to be tacked upon a fence or to some such place, at a height of six feet.

It is a fact worth mentioning incidentally that all of the marine night signals, which are carried on every vessel, are made by the fireworks concerns. The Brooklyn factory supplied those used on the yachts during the recent race across the Atlantic. They are made on the same principle as "bengola" lights, a familiar pyrotechnic toy, but with a wooden handle. Such a contrivance is a pasteboard tube divided into compartments, usually three in number, containing inflammable compositions of different colors. Occasionally stars are added. Inasmuch as the colors—green, white and red—may be arranged in various ways, one can talk across the sea by the help of these lights on the darkest night.

In the tiny houses already described all the filling of roman candles is done. For this purpose machinery is used and it is always a possibility that a spark might ignite the gunpowder and composition, of which considerable quantities have to be kept immediately at hand. But these explosives and also the stars (which take the form of fiery balls as they are ejected from the candles) are stowed in cubbyholes protected by swinging metal shutters. Each time the lone workman helps himself to stars or powder he is obliged to push aside the shutter, which falls again in place the instant that he has obtained what he wants. The cubbyholes open to the outside by windows, so that if there were an explosion the flame would be thrown outward from the building and not into it.

Thus safeguarded against mischance, the lone workman manipulates a machine by the help of which he loads two dozen roman candles at one time. Into them he puts gunpowder, composition and stars successively, layer after layer, ramming down each portion of the charge after the manner of loading an old-fashioned musket. Where candles that hold ten stars are being made the operation is somewhat complicated and hence the importance of doing as many as possible at once.

Most interesting of all, perhaps, is the making of the fire pictures, the construction of which begins with a latticework put together by a skilled carpenter. It is made as light as possible, and upon it is tacked the rattan which forms the outlines of the picture. Rattan is chosen for the purpose because it is pliable and can be bent into any sort of curves. The carpenter has before him a drawing, made by the artist of the company and executed to a certain scale. It is a simple matter to reproduce the lines of this drawing in rattan, so to speak, on an enlarged scale.

Having thus made the outlines of the picture in rattan upon a background of lattice work, the carpenter drives at short intervals along the rattan a series of little nails. Upon each nail is to be put a small cylinder, a quarter of an inch in diameter and three inches long, loaded with some colored fire composition. When this operation has been completed the artist comes along, and with his pencil marks upon the latticework the different colors, "red," "green," "blue," etc., that are to appear in flame in various parts of the design. In obedience to these indications the loaded cylinders, which may number thousands, are stuck upon the nails subsequently by skilled young women. Finally all of the cylinders are attached together by a "quick match," which is lampwick saturated with a mixture of gunpowder and starch and threaded through a thin paper tube. Thus when fire is set to the fuse it will run in a few seconds all over the lattice work and the fire picture will be presented to view in gorgeous colors.

WOMAN FINDS A WAY.

Two burglars were on their trial and had engaged a smart lawyer for their defense, who, on cross-examining one of the witnesses, said:

"You say that on the night in question the moon was so bright that you could see the burglars in the room. Was your husband awake at the time?"

Witness—I don't know.

"Was his face turned toward you or not?"

The witness answered that she did not know.

"What! You don't know? Now, come, tell me, was his face turned toward you or the wall?"

"I don't know."

"Ah, ha! I thought so" (turning to the jury). "She could not see. She who identifies the prisoners could not see which way her husband's face was turned. Explain that if you can."

"Well, sir, my husband is so bald that in a dim light I can't tell his face from the back of his head."—Tatler.

THE MISTAKE OF A NIGHT.

He saw her sitting in the dark corner and knew that his chance had come.

Noiselessly he stole up behind her and before she was aware of his presence he had kissed her.

"How dare you?" she shrieked.

"Pardon me," he bluffed, readily; "I thought you were my sister."

She stepped out into the light. "You silly fool!" she giggled. "I am!"

He fainted.—Cleveland Leader.

Descendant of Avon Bard

In the midst of the Shakespeare festival, and within a few weeks of the banquet to the descendants of poets, a representative has discovered at Wasperton, a little village near Carlecote, a thriving old gardener, named William Shakespeare, whose ancestors have lived for generations near Stratford. That he comes of the family of the poet appears to be a most reasonable belief. He was found tending his flower beds, unregarded by the festival crowd.

"Quite apart from Stratford's pomp and pageantries he has his own little celebrations, and each April 23 his country neighbors call in and wish him 'many happy returns' over a glass of home-made rhubarb wine. None the less, at the very hour when pilgrims from far and near were making speeches and scattering flowers over the grave of William Shakespeare the departed, William Shakespeare, the living, was toiling in 'the eye of Phoebus' alone and unremembered, over his garden borders.

"He happened, with it all, to be a cheery old fellow, unriven to philosophize upon 'man's ingratitude' like his supreme relative, and perhaps a little disappointing as a literary heir. As he chatted at his cottage door, with the swans sailing by in the twilight, he told, with immense conviction and gusto the story of the poet having gone to sleep for 24 hours under a crab apple tree, after a convivial evening, and 'missing a day.' 'You may be certain sure that it's true,' said he, 'for I had it from my father, and the tree is still there. And d'you know what he said when he woke up? "Why, bless me," he says, "Today's tomorrow!" Them was his very first words! You may be certain sure they were!'"—London Daily Chronicle.

Real Estate Exchange

OF WHITEHEAD & MITCHELL

Exchange Bank Birmingham Michigan

The following is a partial list of Farms, City and Village Lots, and Real Estate generally which we have for sale. As our list is constantly changing we request that parties will write us if they do not see what they want in this list.

5

Elegant home, and let 61 feet front by 95 deep (in addition East main) Avenue. Fine location and every convenience. Will sell cheap for cash or part cash. Can be bought for the balance of the year's rent. Will sell on easy city payments for portion of the purchase price.

180

Farm in Avon township; 65 acres of good clay loam, all cleared; small orchard, no buildings; small amount down. For sale, or exchange for small farm.

77

One lot on Woodward Avenue, just south of land owned by John Gunsolus, just frontage. Any one wishing to purchase will find this a good gain. For particulars inquire of Mallie G. Smith, or at Exchange Bank.

147

Nice little home for some one of small means—1¼ acres in n w ¼ of n e ¼ of sec 31, Township of Troy; 7-room house; barn in good shape; well at gain barn and house. Located on the line of Manchester electric; fare to Detroit 15c; R. F. D. All cash and we promise will buy it at this price. Hurry up!

167

Wants to trade for 80 or 40 acres on or near electric. Ninety-four acres on e ¼ of s w ¼ of sec 11, Troy township; 2 buildings valued at $2,000 (insured for $1,700); flowing well piped to barn; farm well adapted for stock or dairy; 1½ miles from electric at Corners; 2 miles from Birmingham; good schools and churches. Fare 17c to Detroit; 400 per acre.

194

Fifty acres in Township of Troy, adjoining the Joy Stock Farm; 6 buildings, good house, basement barn, plenty of small fruit, orchard of excellent fruit; 2½ miles from Flint Division D. U. R.; 2 wells and fine spring. Price $4,000.

198

Fifteen acres in Township of Royal Oak; no buildings; small grove of maples in a pretty location; new land, well drained, clay bottom, black top soil; corner of the 9-mile and Campbell loads, ¼ mile east of electric road; adjoins J. L. Gadsen and Driffield tracts, which are held at $530.00 per acre; 1½ miles north of State Fair ground; to-day $300 an acre; will exchange for latest property.

193

Ten acres 1 mile east of Royal Oak village; excellent land; 60 fine apple trees, no buildings. Price $1,200. The place is well fenced, and the price will enable you to build the kind of house you may require.

201

Fine 2-story residence on Maple Avenue, corner of High Street; 50 feet front, 128 feet deep; hot water heater, hot and cold bath, toilet, city gas, city water—every convenience found in the best class of city residences. Cement walk (cost $200) and best neighborhood in town. House would cost at least $3,500 to build today; ask any one to build it for less and see what they say. You can buy this beautiful home for $2,850, and have it your own way about payments. Ask the man at the bank.

222

Two-story tenement or terrace, on the east side of Woodward Avenue. Two distinct 3-story houses of 8 rooms each. Furnace, water-closet, bath hot and cold water, city water and gas; each independent of other apartment. Rent for $15 per month each, $40 per year will pay taxes and insurance. Good barn on the premises, and the lot is 70 feet front on the back frontage on Woodward, and 180 feet deep; room for a nice garden; one live in one apartment and have a steady income from the other. This is something to ponder over. Come and let us help you ponder. Always at your service. If you can't call, write.

229

A pleasant and sightly farm of 71 acres in West Bloomfield, 10 mile from the North western electric; 1 acre orchard, 4 acres good timber; 5 buildings worth $3,500, and the price is only $5,000—and it is well worth it. Soil, sandy loam and clay loam, under high state of cultivation. Better investigate.

241

Fine new house with all modern conveniences, within 30 feet of the west line of Woodward Avenue; 8 rooms, hard-wood finish; lot 56x100; plenty of room. You could not build the house for $2,000, and that's all we ask for the premises. Well worth looking at.

244

If you could buy an acre and a quarter of land with a brick house equipped with hot and cold water, bath, water-closet, furnace, and every possible convenience, and barn, chicken house, plenty of fruit and cement walks—and the house alone cost $6,000—for $3,000 on easy terms, you'd call it a snap, wouldn't you? Well, we can do it. Come on and we'll show you.

246

One hundred and twenty-seven acres in the Township of Avon. Good buildings worth $5,000; 7 acres of timber, 5 acres of orchard; well watered (Clinton river runs through the farm); the marsh land is 120 feet above the river; fine cedars; 4 wells; 2 good houses, 2 barns in good repair; well fenced; only 1 mile from the thriving Village of Rochester. Will trade for a smaller farm, or will consider an offer of $8,500, with one-third cash. Take you to see it any old time at all.

247

House, barn; and about an acre of good garden land on north side of Hamilton Ave., water, old-fashioned house, and a cozy home at a low price; terms, if you decided to go West and wants to sell badly enough to make a decided sacrifice. Ask the man at the bank about it.

249

Nice, warm, old-fashioned house on the south side of Maple Avenue, among the best class of residences in the village. Plenty of room for a good garden, and it can be bought for $1,600. Not Why not? Well, just come and talk it over with us, and before you look the premises over you will make us an offer anyhow.

250

Now; here is a "Beaner!" House, barn and chicken house, with two acres of land on westerly side of Woodward Avenue, White Electric Park, known as "Elmcrest." 10 room., bath, toilet, 2 cellars, furnace, gas, electric light, 2 grates and mantels, one of the best-equipped lot of buildings in the village—if not the best; double the depth of lot in front. Without exception, this is the finest location and the best lot of buildings on our list, and the price is right.

209

Lots 28 and 29, Pratt's Addition, Birmingham. Price $400 for the two. Easy terms, $25 cash; balance on contract.

270

House and lot, west side of Ann Street; 5-story frame cottage, recently built foundation, 8 rooms and cellar; one block from Woodward Avenue $1,850, terms easy.

273

New cement house, one block from Woodward Avenue, 6 bedrooms, bath and toilet on second floor, hot and cold water, two closets, hot-air furnace, hot and cold water, wood floors, cement walks, cellar, etc. Worth $3,000. Will sell for $2,800 on easy terms.

The Truly Brave.

The strong in heart don't know the meaning of fear, and they seldom speak of bravery.—Florida Times-Union.

Dignamism.

Dignam tells us: "There are many risks in business. The wise man allows his competitors to take them."

Mother the First in Home.

The dominant feature of the home, however loving the father may have been, is the mother.

Country's First Duty.

Let the country be true to the children, and the children will be true to the country.

Gloom and Sunshine.

When somebody's miserable, somebody's happy.—Manchester Union.

Qualities Widely Apart.

Admiration and familiarity are strangers.—George Sand.

280

Farm of 220 acres, 2 miles from Birmingham; 2 miles from Farmington; 2 miles from Novi; 2 miles from Northville; 2 miles from Plymouth; 2 miles from Wayne; 2 miles from Redford; 2 miles from Livonia; 2 miles from Nankin; 2 miles from Garden City; 2 miles from Inkster; 2 miles from Dearborn; 2 miles from Detroit; 2 miles from Grosse Pointe; 2 miles from Gratiot; 2 miles from Mount Clemens; 2 miles from Utica; 2 miles from Romeo; 2 miles from Ypsilanti; 2 miles from Ann Arbor; 2 miles from Saline; 2 miles from Milan; 2 miles from Dundee; 2 miles from Monroe; 2 miles from Toledo; 2 miles from Ohio; 2 miles from Indiana; 2 miles from Illinois; 2 miles from Chicago; 2 miles from Wisconsin; 2 miles from Minnesota; 2 miles from Canada; 2 miles from Hudson Bay; 2 miles from Behring Straits; 2 miles from Asia; 2 miles from Europe; 2 miles from Africa; 2 miles from Australia; 2 miles from Cape Horn; 2 miles from Patagonia; 2 miles from Terra del Fuego; 2 miles from Antarctic Ocean; 2 miles from South Pole; 2 miles from Nowhere; 2 miles from Anywhere; 2 miles from Everywhere; 2 miles from Somewhere; 2 miles from Anywhere Else; 2 miles from Nowhere Else; 2 miles from Everywhere Else; 2 miles from Somewhere Else