Speed of Circular Saws and Saw Mills.

MESSRS. EDITORS:—Under the above heading, on page 51, current volume, appears an article from C. H. Crane, stating the amount of lumber cut with a circular saw 66 inches in diameter, running 800 revolutions per minute. As I am filing a circular saw in Messrs. Holt & Balcom's mill, in this city, I thought I would send you the amount of lumber cut in this mill the last week in July, sawing six days and six nights, the mill inside being in charge of Mr. Nicholas Emery.

I will give a short description of the mill, which has one stock gang, 26 saws, 24-in. stroke, one slabbing gang, sixteen saws, 28-in. stroke, one large circular saw, one splitting saw, one gang edger with four saws, and one single edger behind the circular. There are five boilers, 42 in. diameter, 22 ft. long, two 16-in. flues in each. Engine, 24-in. cylinder, 32-in. stroke, runs 70 revolutions per minute. All the saws are driven by friction pulleys, belts running from counter-shafts to saw arbors of edger saws, etc. Each gang has a driving pulley on main shaft of wood 10½ ft. diameter, 30 in. face, the driver pulleys on gang crank shafts are of iron 4 ft. diameter, and 30-in. face, making the gangs run over 180 revolutions per minute.

The circular has a driving pulley of wood 11 ft. in diameter, 30-in. face, and two counter shafts, one front and one back of main pulley, with an iron pulley on each, 4 ft. diameter, 30-in. face, making a double friction on a belt connecting the two counter-shafts. The large belt pulley on counter-shaft is 9 ft. diameter, and pulley on saw arbor, 30 in. diameter, which would make the saw run 693 revolutions per minute, has a 14-in. double belt.

The circular machine was built by Stearns, Clark & Co., at Erie, Pa. The saw arbor is 4 in. diameter, and saw collars 5 in. diameter. The saws are 60 in. diameter. No. 5 gage in center of saw, and No. 8 gage on rim, and made by the American Saw Co., Trenton, N. J., with Emerson's patent movable teeth.

The feed we carry with these saws is from 1 to 5¼ in., according to the nature of the wood that it is cutting—our feed averages over 4½ inches to one turn of the saw. I have seen them cut 6 inches to one turn.

Each large saw has 32 teeth. There is an overhead saw, 34 in. diameter. They will cut 7 boards, 16 ft. long, per minute, or 6 boards 18 in. wide, or 4 boards, 24 inches wide, and 16 ft. long, per minute. I have seen them saw a log, making 20 cuts, 16 ft. long, and turn the log 4 times on the carriage in 3 minutes, all strips 1 in. thick and 6 in. wide. The logs that were sawed during the week were not picked logs, but taken out of the boom as they come, running from 12 in. to 40 in. diameter.

By the following table, which was taken from the tally-board for the week, will be seen the number of logs that was sawed on the gangs, and also those saw on circular, and the number of feet they measured:

	No. of logs.	Gangs—day.	No. of logs.	Circular—day.	No. of logs.	Gangs—night.	No. of logs.	Circular—night.	Total No. feet.
Mon......	245	70,621	152	35,743	241	63,578	117	30,050	199,992
Tues......	225	71,318	154	38,071	217	62,859	91	22,956	195,204
Wed......	222	70,882	165	38,098	231	69,120	133	31,690	209,790
Th......	244	80,213	157	37,070	237	75,323	141	32,599	225,205
Frid......	256	80,371	162	40,146	237	73,335	139	32,837	226,689
Sat......	257	81,321	141	40,800	261	77,999	113	30,128	230,248
									1,287,128

There were 4,538 logs cut; over three fourths being 16 ft., rest being 12 and 14 ft. long. Between 6,000 and 7,000 of 2 by 6 were saved on the circular, all the rest were what we call strips, 1 in. thick, and 6 in. wide. There were 150,000 laths cut in the same time with one bolting, and one lath saw only running in the day time.

The day hour commences at 6 A.M., and ends at 6 P.M., ½ hour for dinner leaves 11½ hours. Night tour from 6:30 P.M. to 5:30 A.M., ½ hour at midnight for supper, leaving 10½ hours. The circular lost 3¾ hours' time in all on Monday, Tuesday, and Thursday nights. Gangs lost about two hours' time.

I leave it for the readers of the SCIENTIFIC AMERICAN to say if this equals the sawing done by C. H. Crane.

We could cut 50,000 feet stuff the same dimensions as that which C. H. Crane sawed in the same time with this circular.

Oconto, Wis. LUKE BALCOM.

Poison Oak.

MESSRS. EDITORS:—I notice in your issue of the 13th, an article from a writer in the *Entomologist*, who was suffering from the effects of a vine commoly known as poison ivy. The poison ivy of this country is entirely different in appearance from the poison oak common to the Pacific coast.

The poison oak grows there in the form of a small oak bush, often attaining a hight of four or five feet, and in some cases, has long, slender, vine-like branches. Its poison is much stronger than that of ivy, and will yield to no treatment that I am aware of but iodide of potassa. In the *very* worst cases of poison oak it gives immediate relief, as I have witnessed and experienced.

Any physician or druggist can put up a prescription in proper quantities.

Newark, N. J. ANSON SEARLS.

Moon Fallacy.

MESSRS. EDITORS:—I have seen several articles in your paper in regard to cutting timber by "moon signs." More than forty years ago, I cut, for a number of years, at different times in the year, considerable second-growth white beech for plane stocks, which I think is the worst wood known to preserve sound (or keep from getting "dozy," as we used to call it). After trying many moony experiments, summer and winter, I came to this conclusion, that the true secret was to cut the timber when there was the least possible amount of sap in the body of the tree—say the coldest weather in the winter or the warmest in summer—June or February, when the sap is in the tops or in the roots of the tree. Every tree I cut after the sap began to start in the spring was sure to "doze," until June, when I found it safe to cut again.

G. W. HILDRETH.

Lockport, N. Y.

To Prevent Cracking of Wagon Hubs in Seasoning.

MESSRS. EDITORS:—In answer to your correspondent E. H. H., of Md., who finds difficulty in the cracking of wagon hubs made from "black gum," I have to say that from satisfactory investigations made with the vapor of coal-tar wagon hubs and stock can be perfectly insured against cracking, shrinking, and swelling, in any climate.

The apparatus is very simple. Take a common "try pot," such as is used by whalers, or a farmer's large boiling kettle; fit to it a wooden cover, to fasten with small screw bolts or clamps to the rim to be vapor tight. A piece of one-inch gas pipe screwed into the cover serves to convey the vapor of the coal tar from this extemporized still to a large cask, which may be set upon one head, as a receptacle for the hubs. The still pipe is led to the bottom of the cask, which is then filled with hubs, and a cover fitted over all, to be vapor tight, with a small safety valve arrangement to regulate the pressure. The kettle is then filled with refuse matter from the gas works or crude coal tar, the cover secured, a fire lighted under the kettle, and shortly the hot lighter vapors penetrate the mass of hubs at a temperature of about 200° to 220° Fah. The hubs are effectually and gradually heated, so that all the watery particles are expelled from the wood in steam and replaced by the light vapors of the hydrocarbon oil. Subsequently the heavier oils are distilled over and fill the pores of the wood. The process is finished in about twelve hours, and you have a hub that will stand anywhere short of a fire. A few experiments will satisfy any one of the efficacy of this treatment. One of the products of this distillation is carbolic acid—the best known antiseptic—and the hubs will be found strongly impregnated with the peculiar smell of this well-known agent.

A large establishment would of course have a more perfect apparatus, but the above will serve to prove its value at small cost.

PACIFIC.

San Francisco, Cal.

Seasoning Hubs.

MESSRS. EDITORS:—If E. H. H., of Md., will bore his hubs immediately after they are turned, and paint (as soon as possible after turning) the entire outside with any kind of paint which will effectually prevent the moisture escaping through the outside surface, then give them time to season, the moisture in the process of seasoning will escape through the aperture bored to receive the axle while the surface will be held intact. When well seasoned, mortice for the spokes and drive them in immediately; by doing so he will avoid the cracking of which he complains.

A. GREGG, M. D.

Indianapolis, Ind.

Worms and Insects.

MESSRS. EDITORS:—I have been much pleased and instructed by the able articles appearing in your columns, on various characters of insect life, by Prof. Day, of Columbia College. Some of us, less learned in the homes and lives of the bugs and worms, would be glad to have him tell whence comes and whither goes the new and intensely disgusting worm which has, within a few years back, begun to attack the ailanthus trees.

H. E. C.

Brooklyn, N. Y.

[These worms are those commonly called the ailanthus silk worm. They were, we believe, brought from France here by somebody as an experiment. Residents of Brooklyn no doubt wish the experiment had never been tried.—EDS.

[For the Scientific American.]

THE TRUE THEORY OF FLYING.

The world seems to have concluded that the cycle of inventions is complete—that the telegraph has taken the last and topmost place; and that men must be satisfied with the great time and labor saved which they now possess.

But the Duke of Argyle, and a few other brave spirits, think differently, and are spending time and money in endeavoring to obtain for us the art of flying, which has so long bid defiance to human skill.

The writer has been deeply interested in the subject, and perhaps his conclusions may be of service to those who are experimenting upon the art. They are as follows:

1st. No successful flying machine can be constructed, which depends for its support in the air, upon the balloon principle—that is, which requires a bag full of gas for its flotation in the atmosphere. Because, the surface of resistance increases as rapidly as the propelling power is increased—greater weight of engine, etc., requiring greater size of balloon for its support in air. Because this plan has been tried both in New York and San Francisco without a shadow of success. Because it is in direct contravention of the method of nature. Every bird weighs so many pounds or ounces avoirdupois, and the heavier the bird, as a general rule, the more powerful and swift the flight.

2d. The future flying machine must be constructed upon some mechanical principles analogous to those which obtain in nature. Looking at these we find two prime requisites: 1st. A mechanical contrivance adapted to supporting and propelling the flying creature. 2d. A tremendous muscular power to call this machine into action. It would not be difficult to imitate the wings of a bird, with sufficient observance of the laws of mechanics to fulfill the conditions of ascent and propulsion, provided that we could get the power to drive our machine.

A system of properly-balanced and adjustable vanes, inclined on the principle of the propeller-screw will raise a flying vessel in air, and propel her in any direction. But the driving power must be enormous in proportion to the weight of machinery—just as the pectoral muscles of the bird are far more powerful than those of any non-flying animal; or, as far as I am informed, than any other muscles whatever, in proportion to their weight.

The whole question is then—What can we find analogous to the driving power of the wings of a bird? What power is there in nature which we can lay hold on and turn to our uses, which, nevertheless, needs no cumbersome boiler, no heavy fuel, and no complicated, and therefore weighty machinery—all and each of which are death to the flying machine theory.

Let us look at the known agents which we employ in propelling our machines.

There is steam. It requires no argument to show that its power is inadequate to carrying the necessary weight of machinery, etc., in air. Electricity is probably weaker than steam, under these conditions, in its present mode of use.

Either the power required must be concentrated before starting, and deposited in the machine in the shape of a compressed spring, or a cylinder full of condensed air, or we must get some new agent, as yet untried, which will give tremendous power without weight in as great proportion as in the known engine.

The compressed spring or condensed air plan may do for short flights. The writer however, has not much faith in either, and has not the present ability to test them by experiments.

But we have an agent sufficiently powerful and perhaps sufficiently governable, which will drive our flying machine for us with abundant force. Either gunpowder, dynamite, or the fulminates, have sufficient strength, with comparatively no weight. Witness the flight of a five-hundred pound shell for miles, at an elevation of thousands of feet, driven by a few pounds of powder! Consider the number of horse-powers involved in this exhibition of strength, and calculate the weight of the steam engine, its boilers, and fuel, which should accomplish such a result! There is no question about our having the power, but have we not too much? More than is controllable by human ingenuity?

The flying machine of the future does not need to draw upon these terrible forces to their full extent. Gunpowder and all explosives have limits to their power and are governed by laws, and can probably be used as propelling agents with a safety greater than that of the steam engine.

They are the only known agents which are, in their great power and small weight, analogous to the muscles of the bird.

How this power is to be applied and regulated could soon be ascertained by ingenious and educated engineers. Perhaps it would be well to have a cylinder in which successive explosions should preserve a constant and high pressure, which, by proper machinery, would drive the propelling fans.

Or, if a fulminate is obtainable which condenses to an insignificant amount of liquid immediately after explosion, a pair of iron hinges, as it were, which would expand and contract with great force by these successive explosions and condensations, might furnish the desired means of applying the power.

The rocket is a proof of the power of powder to carry vessels through the air. It is the rudest form of flying machine, and when the genius of man is fully directed to economizing and guiding the great power which is the cause of the rocket's flight, we will have a speedy, practical, and safe flying vehicle which will astonish the world by its simplicity and tardy discovery.

A few misconceptions on the subject may be spoken of. It is generally supposed that a flying machine must be a perilous means of travel. This is not so. If one were constructed on the principle spoken of in this paper, there would be no necessity of its travelling high in the air. A few feet above the ground would suffice, and many known appliances could be added, which would render a fall innocuous. The lower side could be arranged with powerful spiral springs, which would make a concussion harmless, or a system of parachutes could be devised by which passengers could descend to the ground with safety.

Arguing from the analogues of nature, as we find that the largest fish far exceed in size the largest bird, so science will find itself compelled by laws, at present unknown, to limit the size of flying machines to some such ratio with steamers, as obtains between bird and fish. If the largest bird is only one-tenth the length and general dimensions (not meaning bulk) of the largest fish, so, considering the largest steamers to be 500 feet in length, which they will probably not successfully exceed, we can expect flying machines, perhaps fifty feet in length. As the speed of the bird is swifter than that of the fish, so we can look for a greater speed in air, by the same rules, than in water. The flying machine in future will go to Europe in two days, and with greater safety and comfort than the present mode of transit.

They will be swifter, easy of construction, and will come into universal use, though they will be more expensive than other conveyances. Speed and concentrated fuel *mean* expense. As rapidly as the magnetic telegraph, when once invented, overspread the globe, so rapidly will every county and town adopt the new invention of the new future, the *hoplites* of traveling convenience.

C.

HE who strikes out a new path in art, science, or literature, secures for himself persecution.