

RAILWAY CONSTRUCTION IN 1879.

The *Railway Age* has an article reviewing the progress of railway construction during the last year. It says that the past year has been an extraordinary one in respect to the revival of railway building, more miles of track having been laid than in any year since 1873, and probably more than in that year. We quote as follows: The returns, of course, are not yet all in, but from various sources of information we have compiled the following table showing the total mileage constructed in each State, so far as we are able to learn, reserving the opportunity to a detailed statement with additions:

	Broad gauge.	Narrow gauge.	Total.
Alabama.....	153	—	153
Arkansas.....	—	9	9
Colorado.....	7	60	67
Dakota.....	220	—	220
Georgia.....	10	25	35
Illinois.....	90	—	90
Indiana.....	74	404	1144
Iowa.....	325	46	371
Idaho.....	—	90	90
Kansas.....	408	—	408
Kentucky.....	65	—	65
Louisiana.....	65	—	65
Maine.....	—	18	18
Maryland.....	18	—	18
Massachusetts.....	11	—	11
Michigan.....	12	414	534
Minnesota.....	394	—	394
Missouri.....	161	27	188
Nebraska.....	125	—	125
Nevada.....	—	35	35
New Jersey.....	4	—	4
New Mexico.....	125	—	125
North Carolina.....	25	—	25
New York.....	674	6	734
New Hampshire.....	—	94	94
Ohio.....	105	1084	2184
Oregon.....	30	—	30
Pennsylvania.....	14	5	19
South Carolina.....	—	2	2
Tennessee.....	119	57	176
Texas.....	120	674	1874
Utah.....	83	46	129
Virginia.....	294	—	294
West Virginia.....	—	20	20
Wisconsin.....	90	15	75
Total.....	3,010	7284	3,784

It will be noted that the greatest amount of tracklaying has been done in Kansas, which shows nearly 500 miles of new roads, while Minnesota follows with 394, Iowa with 371, young Dakota with 220 and old Ohio with 2134, and so on.

It is also notable that nearly one-quarter of the total mileage—at least 728 miles—is of narrow gauge, showing that the narrow-gauge "delusion," as some call it, has not yet run its course.

WHERE THE COLD WAVES COME FROM.—Meteorological observations have now become so extended that evidence is rapidly accumulating to enable us to determine positively the source of the cold aerial waves which sweep across our country during the winter season. The indications are that we owe them to the great area of high barometer in northeastern Siberia, where the pressure sometimes exceeds 31.50 inches, and the temperature falls as low as 76° below zero. The pole of greatest cold is in the neighborhood of Yokutsk, on the Lena, where the average thermometric reading in January of 41° below zero, and where the severest cold exceeds by 10° that experienced by explorers in high arctic regions. This is also the region of the highest barometric pressure known in winter; and from it, doubtless, proceed the waves of intense cold which play so large a part in our winter experiences.

KEY-HOLE SAW.—The Japanese hand saws cut on the pull-stroke; so no matter how hard the wood or dull the saw, they will not bend or buckle. It is rather more difficult to saw to line with such saws than with ours, but they have their advantages. Take one of our key-hole or compass saws, cutting on the push or shove stroke, what an aggravating, limber thing it is. Now point the teeth the other way, and you have a tool that will keep stiff no matter how many knots it encounters or how dull it gets. In other words, the pull-stroke of 3,000 years ago is the best for such thin, narrow blades.

CHANGES IN THE APPEARANCE OF JUPITER.

Writing with reference to the strange belt on Jupiter, in a communication to the *Scientific American*, dated September 28th, Mr. J. A. Brashear, of Pittsburg, Pa., says: "I first saw it at 2:45 A. M. on the 26th of June. A nine-inch silvered glass Newtonian telescope was used in this observation. The belts on the equator were of a beautiful pinkish brown color. The broken belt noticed by your correspondent was so vivid and clear that it reminded me of a coke fire seen on a dark night. It made such an impression on my mind that I at once made a sketch of it, which has been of great value in subsequent observations. In referring to my note book I find I have eight drawings of the planet since the above date. Comparing the last drawing with the previous ones, I am led to believe that the spot has slowly diminished in size, though not in general outline. Another and still more strange phenomenon has occurred, and to this I should like to call the special attention of observers. In my drawings I have located the white spots plainly visible between the equatorial belts, and by comparing the consecutive sketches I find that either the spots or the red belt has shifted in reference to one another about one-fourth the length of the red belt.

"Any one who has read Camille Flammarion's interesting article on Jupiter in the last number of your supplement, will see that this shifting of the spots is no new thing, but the question is, Which belt or spot has shifted? I am inclined to think, with my esteemed friend, Mr. F. W. Very, assistant to Prof. Langley at the Alleghany Observatory, that it may be some terrific action is going on in a local spot beneath the red belt which has dissipated or torn away the vaporous envelope of the planet over the place of local disturbance, and we possibly see the actual surface of the planet beneath or through the rift in the vaporous envelope. If this conjecture be true, then it is more than likely that the shifting has been in the white spots beneath the equatorial belts, as the local action which gives us the red belt would hardly be of a shifting character. I have used 6.5-inch, 9-inch and 12-inch aperture silvered glass telescopes, and 4-inch and 13-inch achromatics, at different times of observation, and have had some exquisite views of this marvelous planet and its attendant panoramic phenomena."

"JANNIN'S CEMENT," a recently patented French product, named after its inventor, is simply composed of a mixture in suitable proportions of yellow oxide of lead—that known in trade as "Massicot" is preferred—and glycerine; other metallic oxides and coloring matter may be added to the above mixture, according to the character or color that may be desired. The cement may be made to possess more or less stiffness by varying the proportions of glycerine—the larger the percentage of the latter, the softer the cement, and vice versa. This cement is represented to be especially adapted for molding objects which demand an extreme delicacy in the lines of the cast, such as engraved blocks and plates, forms of printing type, photoglyphic plates, etc. It is affirmed that it sets in a few minutes under the influence of a gentle heat and then admirably resists heat and pressure. When set, it is said to make a good substitute for lithographic stone. It is also recommended for artistic reproductions, such as fac similes of terra cotta, the color and sonorosity of which it closely imitates. It does not shrink in setting. So says the *English Mechanic*.

TO DESTROY BUGS AND FLEAS.—This mixture, which has been patented in France, consists of 80 parts of bisulphide of carbon and 20 parts of essence of petroleum.

NEW INVENTIONS.

We publish descriptions of the following new inventions, obtained through Dewey & Co.'s Mining and Scientific Press Patent Agency, San Francisco:

RAILROAD CHAIR.—John R. Sullivan, San Rafael, Cal. Patented Dec. 30, 1879. No. 223,187. This invention relates to that class of railroad chairs wherein two chairs and a connecting metal bar serve to secure the track, the object of which is to provide such a chair as will give a broad sustaining surface to the rail, and yet greatly cheapen its construction. The rail-supporting bases are of cast iron, and in form like a parallelogram. The upper side is made to slope in each direction from the line where the rail crosses it to the outer end, and these inclined faces are grooved so that a large base may be obtained without undue weight. Each pair of bases are united by means of a wrought iron bar which has its ends laid into the mold so as to be cast with them. The top of the base has a double slot formed across it, the outer side of one slot having its bottom of the height at which it is desired to have the base of the rail stand, and is beveled under the outer face so that one flange of the rail will be in this groove. The inner part of the slot has its bottom lower than the plane of the upper slot, and the meeting edge between the two is inclined and dovetailed or beveled downward and backward. A key is formed so that when in place its contour will be and form a part of the base. The whole forms a cheap and convenient railway tie.

CHECK HOOK.—Wm. M. Blain, Salinas, Monterey Co., Cal. Patented Dec. 30, 1879. No. 223,028. This invention is called a "thimble" pad-hook, and consists of a bearing post, which is secured at the point usually occupied by the pad-hook. The post has a spring-catch fitted to it either in front or behind. A thimble or sleeve is permanently attached by a loop or link to the bridle check-rein, and is fitted to slide down over the post, where it is held by the snap-hook, so that it cannot be accidentally detached. By this construction a much neater connection is made between the check-rein and the pad, and one which may be engaged or disengaged with one hand. The strain upon the rim is much lower down than when the ordinary hook is used, and does not pull the pad over as much.

VEGETABLE DYES FROM CABBAGE.—MM. Savigny and Colineau have just made a discovery of considerable practical importance in obtaining harmless colors from this vegetable. They have succeeded in extracting from red cabbage, or broccoli, a coloring matter which is absolutely inoffensive, and capable of application in all the ordinary operations of painting, printing and dyeing. To this they have given the name *cauline*, from the Latin *caulis*, a cabbage. The leaves of the plant are cut into small pieces, thrown into boiling water in the proportion of 3 lbs. of the leaf to 3 liters of water, and there left to macerate for 24 hours; at the end of this time they are withdrawn and subjected to a strong pressure, and the juices thus expressed are added to the liquor of infusion. As thus obtained, the "*cauline*" is of a blue-violet color, and forms the base of a series of derivatives of various colors.

WEIGHT OF DIFFERENT MINERALS.—The following shows the weight (avoirdupois) per cubic foot of various kinds of material: Average mortar, 106 pounds; loose earth, 95 pounds; common soil (compact), 124 pounds; clay (compact), about 135 pounds; clay with stones, 160 pounds; brick, 125 pounds; lead, 709 pounds; wrought iron, 481 pounds; cast iron, 450 pounds; lime, 64 pounds; sand (loose), 96 pounds. And the following shows the bulk of one ton of different substances in cubic feet: earth (compact), 18; earth (loose), 32 cubic feet.