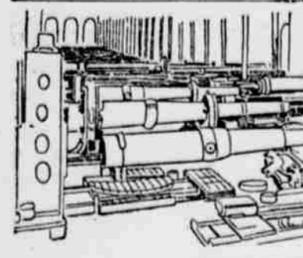


MAKING BIG GUNS.

WORK AT A UNITED STATES GOVERNMENT ARSENAL.

Why a Composite or Built Up Cannon Is Stronger Than One Cast in a Single Piece—Cost of Modern Gunmaking.

THE making of guns to-day is not the simple foundry work of a few years ago, but a science requiring the deepest mathematical calculations, the most intricate and careful preparation of designs, and skilled workmanship scarcely second to that required in the manufacture of the finest watches. It was necessary for the United States Government, in order to insure a certain supply of guns, to establish a National gun factory for the army, and also one for the navy. While these factories are sufficiently large to supply the peace demands, they could not supply the demands in case of war. To provide for the latter emergency, instead of increasing the plant of the established factories, it was deemed wiser, by giving sufficient-



INTERIOR OF THE NEW GUN SHOP.

large contracts for guns to private firms to induce them to introduce gun making as a branch of their business, so that at the present day there are a number of steel works capable of building guns equal to those turned out at the National factories.

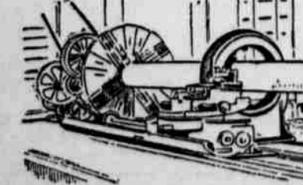
The army gun factory is situated at Watervliet arsenal, West Troy, N. Y. The grounds contain over one hundred



SHRINKING ON AN EIGHT-INCH JACKET.

acres, and are advantageously located on the Hudson River and Erie Canal. The factory consists of the old gun shop connected with the large new gun shop; the former is devoted principally to the manufacture of guns of smaller calibres, and the latter to the manufacture of large calibre guns. The new building consists of two wings connected by a central section. The north wing is 400 feet long and 128 feet wide; the central section is 165 feet long, and the south wing is 400 feet long and 158 feet wide. The extra width of this wing is to accommodate the enormous lathes (some of which are over one hundred feet long) which are needed for the manufacture of the largest calibre guns.

The shops are filled with lathes, boring mills, drills, slotting, milling and rifling machines. Overhead, running the entire length of the building, whose



BORING THE TUBE OF A TWELVE-INCH GUN.

total length is 965 feet, are two traveling cranes capable of carrying the huge masses of metal to any part of the building.

The manufacture of a gun is a very interesting operation. A modern high power gun is a complex structure "built up" or composed of a number of parts. There are two reasons for "building up" a gun. First, it makes it stronger; second, since the parts used are made from smaller masses of metal, the quality of the metal can be made better and quite uniform. The rough forgings, from which the parts of the gun are made, are made at private works for the Government and shipped to the factory, where they are carefully inspected to see that they fulfill the requirements.

The piece which forms the part next

to the bore of the gun and which is called the "tube" is first picked up by the traveling crane, and placed in one of the huge lathes to be turned and bored to the proper size. This tube is the longest piece in the gun. By itself it would not be strong enough to stand the powder pressure, so it has to be strengthened by "hoops" and a "jacket."

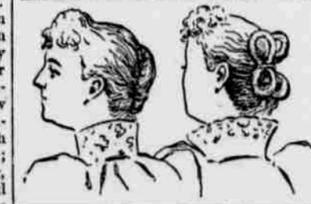
When the tube is finished the jacket, which is the first piece "assembled," is turned and bored. The interior of the jacket is slightly smaller than the exterior of the tube, so that when assembled it will compress the tube and so increase its strength, since the powder gas must first overcome this compression before it begins to strain the tube. This is the reason why a "built up" gun is stronger than one made of a single casting. The condition is somewhat similar to two trains, one at rest (the case of the single casting) and the other backing. The engine of the first can start ahead without much expenditure of force while that of the latter has first to overcome the retrograde motion before it can start ahead, and, therefore, must expend much more force. The "built up" gun whose tube is under a strain of compression can for a similar reason stand a much greater powder pressure before bursting than a gun made by a single casting.

When the jacket is finished it is placed in a hot air furnace and heated

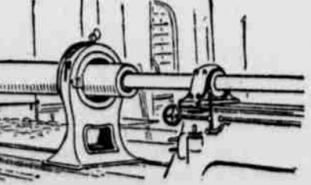
to about 550 degrees. This heat causes it to expand sufficiently to be placed over the tube. To assemble the tube and jacket the former is placed on end in a shrinkage pit in the middle section of the factory, and the jacket, after being heated, is slowly lowered into place. It is then cooled by a stream of water which is thrown against it. The hoops are next finished, and as soon as the jacket is cool a row of hoops are shrunk on one by one in a similar manner extending from the jacket to the muzzle. It is necessary to still further increase the strength of the gun over the bottom of the bore, where the powder pressure is the greatest; consequently the jacket has shrunk over it a row of hoops. The gun is now almost completed, though it still has to be placed in the lathe to be rifled and turned on the outside. When this and the breech mechanism is fitted and the gun is ready for shipment to the proving ground. Every gun after completion is thoroughly tested on the proving ground before it is sent to the fort where it is to be mounted. The sea coast guns in our service weigh from fourteen to sixty tons and cost on the average of \$1000 a ton.

The smaller guns are made in a similar manner in the old gun shop and differ from the one described only in having a fewer number of pieces. Some of the smaller guns can be completed in a few weeks' time, but to complete a gun of the largest calibre it requires several months of continuous work.—New York Herald.

New Styles in Hair Dressing.
The brief day of the Brighton bun is past, and somewhat less atrocious hair dressing prevails. The two favorite styles at present are the simple coil



just above the nape of the neck and the double loop somewhat higher. In the latter the hair is twisted into two coils close together, each one representing the figure "S." Instead of the customary pin of shell or silver or gold, a clasp, fastening the loops across the center, is the only adornment.—New York World.



Bound to Be With the Times.

"Say, why don't you shake that old eggshell off?"
"Shake nothing! Don't you know that crinoline is the style again?"—Truth.
Cadets at West Point receive a salary of \$540 a year.

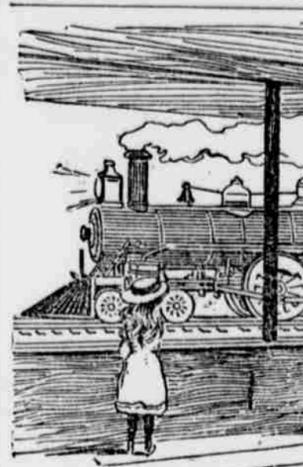
TEXTILE EXHIBITS.

AMERICAN COTTON, SILK AND WOOL AT THE FAIR.

Brilliant Contents of Sombre Cases in the Manufactures Building—A Railroad Train Made of Silk Spools.



COTTON, silk and wool enter largely into the textile exhibit in the American section of the Manufactures Building and it now is complete. It occupies the northeast corner of the building and has been dubbed "undertakers' row," because of the number of black cases. However, the contents are brilliant enough and attract crowds of people. The space, which is one of the largest in the building, is divided into three sections, wool, silk and cotton. The wool and silk exhibits are made by the association, the members of which are



RAILROAD TRAIN MADE OF SILK SPOOLS.

wholesale dealers. The cotton exhibits are made by individual firms.

One does not expect, as a rule, to see a lot of pieces of cloth piled up in a picturesque way, but that is just what the woolen exhibitors have done. In one case is shown a lot of blankets made entirely of American wool. They are



DISPLAY OF FASHIONABLE FABRICS.

light and soft, and suggestive of warm comfort in cold weather. In the overcoat materials the goods are graded from the very heavy shaggy cloths down to the very finest. There are thirty-four of these cases representing 115 mills extending from Milwaukee to



SCENE IN THE TEXTILE EXHIBIT.

Maine. The progression of the work is shown by a dirty fleece just shorn, and this being the first step each succeeding process is exhibited, the carding, spinning, weaving, and finally the completed cloth. All the grades and styles known to woolen manufacture are shown. Several cases are filled with bright colored yarn and the finer thread used in making cloth.

The silk department is the most picturesque, as the soft quality of the goods admits of full scope in the window dresser's art. One of the most interesting and at the same time instructive exhibits is at the north end of the space. There is a long show case with a row of bottles. In the first is the moth, then in succession are shown the moth eggs, the hatching process, with the worm one day old and so on up to the age of four weeks, when it begins to make silk. Keeping up the progression the cocoon is exhibited in its various stages from the time it is cov-

ered with the shell that looks like a peanut to the time when it is uncovered, reeled and ready for the loom.



A JAPANESE GARDENER.

The silk has three natural colors, white, cream and yellow, and 100 cocoons are required to make one skein of the delicate silk. This is reeled by a machine in charge of a girl. The cocoon is put in a large machine, and one end of the silk thread is found. The motion, although rapid, is very

gentle and not unlike the process known to many a small boy who has listened to fairy stories from his grandmother while he held her skein of yarn. In the same case are shown some very pretty designs made of silk skeins and braids. One is a large fan shape with a fountain scene on the side, all worked out with bunches of bright colored silks. They are not sewed together, but simply placed in bunches, and are very artistic.

The most elaborate of all the displays is made by a silk thread firm. It is an engine and car made of spools. Eight thousand spools of silk are used. Each piece is ten feet long. The wheels are made of large spools and the spokes of smaller ones. They are all of black. The panels of the car are worked out in different colors. The engine is the most wonderful piece of work. Every detail has been worked out in a marvelous way, even to the counter-weights on the side of the drive-wheels. From the smokestack flies backward a lot of silk floss, very black at first and ending in thin steam. The bell is made of gold-colored silk and the reversing lever is made of tin spools put end to end. The only material not made of spools is the headlight, which is a reflector with an electric light.

Another case shows a life-size figure of a Chinaman watching a big silk worm at work. All of the products of the silk worm are shown and they take many forms. There is a collection of hosiery fit for a princess and beautiful silks for gowns. Many of the articles are made expressly for this exhibit, while others are just the stock of the firms.

THE LAW AND THE HOLIDAYS.

An Opinion from Attorney General Hensel's Law Firm That Will Be Read With Interest.

The law firm of Brown & Hensel, Lancaster, furnished the following to the "Pittsburg Times" being a copy of an opinion which they gave to certain banking institutions which they represent.

The opinion will be found worth preservation by such as are interested in the subject: We have considered the act of May 31, 1883, designating election days as legal holidays, and also the act of May 31, 1883, designating the days and half days to be observed as legal holidays and the effect of these laws upon the payment, acceptance and protesting of bills, notes, drafts, checks, and other negotiable paper on such days, and we have conferred with the solicitors of a number of other banking institutions in this county, and after coming to an unanimous conclusion with them, we are prepared to advise and instruct you as follows: Hereafter the following days and half days will be legal holidays and half-holidays in this Commonwealth:

- I. LEGAL HOLIDAYS.—
 1. The 1st of January, commonly called "New Year's Day."
 2. The 22nd day of February, known as "Washington's Birthday."
 3. Good Friday.
 4. The 30th day of May, known as "Memorial or Decoration Day."
 5. The Fourth day of July, called "Independence Day."
 6. The first Saturday in September, known as "Labor Day."
 7. The first Tuesday after the first Monday in November, called Election Day.

Any day appointed or recommended by the Governor of this State or the President of the United States as a day of thanksgiving or fasting and prayer, or other religious observance, generally known as "Thanksgiving Day," and generally falling on the last Thursday of November.

The 25th day of December, known as "Christmas Day."

II. HALF HOLIDAYS.—

1. Every Saturday of the year from 12 o'clock noon until midnight.
2. The third Tuesday of February of each year, known as "Spring Election Day," from 12 o'clock noon until midnight.

In all cases on which legal holidays occur on Sunday, the following day (Monday) shall be deemed and declared a public holiday, except when the 30th day of May—"Memorial or Decoration Day," falls on Sunday, the day preceding Saturday shall be observed as the holiday.

Hereafter all bills, checks, drafts, and notes otherwise payable for acceptance or payment on any holiday shall be deemed to be payable and be presentable for acceptance or payment on the secular or business day next succeeding such holiday or half holiday, except that checks, drafts, bills of exchange and promissory notes payable at sight or on demand, which would otherwise be payable at any half holiday (Saturday), shall be deemed to be payable at or before 12 o'clock noon of such half holiday, but demand or acceptance, or payment of any such check, draft or note not paid before 12 o'clock noon, shall not be made and notice of protest or dishonor thereof shall not be given until the next succeeding secular or business day, and no liability is incurred through failure to present or protest sight or demand items on half holidays.

In other words, protests of paper falling due on any holiday, or on any Saturday of the year, shall hereafter not be made before the following secular day, and in the case of Saturdays, or of any holiday falling on Saturday, paper shall not be protestable until Monday. Writs may be served and executions issued, judgments entered and other legal process executed on Saturdays, as heretofore.

Subject to the foregoing restrictions as to protests, any bank may keep open its doors, by a vote of its directors, it shall elect so to do and may transact its business on Sunday afternoons, and we recommend that in all cases the board shall determine this matter by a resolution.

We are of the opinion that in discounting notes falling due on Saturday or on any legal holiday, the discount should be taken off up to the day on which they are protestable, that is, the next secular day succeeding the holiday or half holiday on which they would mature. We are further of the opinion that a note falling due on a legal holiday or on a Saturday cannot be charged up until the succeeding secular or business day, but that it can be charged up at any such hour on succeeding secular day. We are of the opinion that this law applies only to paper made on or after May 31, 1883, except that paper made after May 23, 1884, and maturing on Tuesday, November 7, of this year—election day—should not be protested until Wednesday, November 8.

THE REMODELED BALLOT.

CHANGES MADE BY THE LEGISLATURE IN THE BALLOT LAW TREELY STATED.

The ballot is decreased to one-half the size required under the original law. Only one set of official and sample ballots are required to be printed and distributed, instead of duplicates, as before.

The time allowed for printing the ballot is extended. The percentage of party nominations is reduced from 3 to 2 per cent of the vote cast at the previous election.

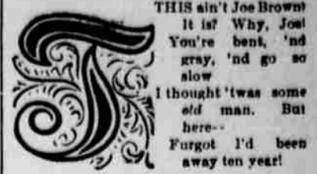
The printing and distribution of the ballots for spring election is to be done under the supervision of the County Commissioners, instead of the Township Auditors.

One mark in a circle at the top of a column of candidates shall count as a vote for every candidate in that column.

Where the mark is not placed in a circle a mark opposite the name of every candidate voted for is required.

SOLDIERS' COLUMN.

BETTIN' THE FLAGS.



THIS ain't Joe Brown it is 'Why, Joe! You're bent, 'nd aray, 'nd go so slow I thought 'was some old man. But here—Furgot I'd been away ten year!

I had to come, Joe. Had to come For one more Thirtieth o' May, To see the boys, 'nd help 'em so ne In keeping Decoration Day.

Bur whar ye bound for this time, Joe? To set the flags? We'll both on 's go 'Nd mark the end o' the march, that's done, 'Nd call the roll o' the boys that's gone. Say, Joe, you 'n me have come so near The still place whar

They're camped, that we can almost hear 'Em answer their names from Over There! Ther's jest ten graves, I 'member 'em all—Ten men that's answered Detail Call. Five flags far me, 'nd five fur you. What's all the rest fur? Ten'll do!

'Nd whar's the rest o' the boys to-day? 'Nd ther's should be twelve on 's, counting you. I hope they ain't took to stayin' away! 'That ain't the way they usester do! 'Taint right! They all had oter coms To mark the graves for 'Morial Day. No matter 'f work is pushing some!

Why, Joe! You're cryin'! What's all ye, Joe! What's that! Good Lord! That can't be so! All dead but us? Why, Joe—But ther, That couldn't be, outside o' war.

Did fa' in battle? Yes—you're right. We've all been in a long, hard fight. They tell in battle, yes, that's so! 'Nd that's the way we've got to go. An', Joe, I'll bet

Not one o' them boys ever let The colors outen 's sight!

Well, Joe. We've got these flags to set. Here's ten fur me 'nd ten fur you keep. Ther's two of us is wakin' yet.

To stan' guard over them that sleep! But which o' us two, Joe, does 'em owe Will set the flag for the next that goes? —James C. Purdy, in Washington.

Chickamauga.
The terrific nature of the great struggle at Chickamauga will be illustrated by the record of the 21st Ohio. In the course of the battle that regiment fired 43,559 rounds of fixed ammunition, and fought till its last shot was expended. It suffered a loss of one officer and fifty men killed, three officers and ninety-eight men wounded, and twelve officers and one hundred and four men captured, yet even such magnificent bravery as its men exhibited could not suffice to give victory to the Union arms.

The total number of troops engaged on either side in the battle has never been satisfactorily determined. The total strength of the army of Rosecrans was from 55,000 to 65,000 effective men, and quite likely was not far from the first-named figure. Bragg's force has been variously estimated as having been from less than 50,000 to fully 70,000. The probabilities are that the two armies in number were very evenly matched. The losses of Rosecrans, in killed, wounded, and missing, were over 18,000. The losses of Bragg seem to have been at least as heavy, for there was terrific slaughter during his desperate attempts to drive Thomas from Horseshoe Ridge. Were we to consider as accurate the Federal estimate of the Confederate loss, and the Confederate estimate of the Federal loss, the figures would be very greatly increased. The Battle-field at Chickamauga. —BLUE AND GRAY, Philadelphia, Pa.

"Maryland, My Maryland."

The story of how the poem "Maryland, My Maryland" was set to music and adopted as a Southern war song is a romantic and interesting incident of the Civil War. The music at first chosen was Frederic Bera's "Ma Normandie," but that was soon "swept away" to use Mr. Randall's own language, when the lovely German lyric, "Tannenbaum, O Tannenbaum" was selected as a more spirited air. Shortly after the battle of Manassas, General Beauregard invited several Maryland ladies who were living in Virginia, to visit his headquarters, near Fairfax Court House. The ladies and their escorts camped the night at Manassas, were they were surrounded by the famous Washington Infantry of New Orleans. The boys in gray, at the end of the serenade, called for a song from the ladies, and Miss Jennie Cary, standing at the door of the tent sang "My Maryland." The refrain was quickly caught up by the soldiers, and the camp rang with the words "Maryland, My Maryland." As the last notes died away, the wild Confederate yell was given, with "three cheers and a tiger for Maryland." A spectator of the scene relates that there was not a dry eye in the ladies' tent and not a cap with a rim on it in camp. This is how "My Maryland" came to be adopted as a national war-song of the South. —THE AUTHOR OF "MARYLAND, MY MARYLAND." —BLUE AND GRAY, Philadelphia, Pa.

A Brave Dog.

The bravery of a dog was notably shown recently in a struggle between Mrs. Burrill, cook at Board's Head Tavern, Leeds, and a ruffian named Rothery, who was insane with jealousy, says the London News. The villain had enticed Mrs. Burrill into a remote room, and was about to dispatch her with a razor when the hotel dog issued from under a couch, and springing upon the assassin seized him by the coat sleeve close to the wrist. This compelled the man to attempt to shake the animal off. Meanwhile he necessarily relaxed his hold upon the woman, who now found strength to call for help. Rothery, however, succeeded in releasing himself, and once more he rushed at the woman, razor in hand.

The dog, however, was still more amiable; he sprang between them, and leaped to seize the fellow by the throat. It was at this moment that the landlady, having heard the screams, rushed into the room. With great presence of mind the landlady dragged Mrs. Burrill out, and closing the door shut the man in the room with the dog. The animal did not further molest Rothery, who thereupon cut his own throat, and was found by a policeman a few minutes later at the point of death.

FROM A LAST WILL.—"My faithful servant Johann is to receive 3,000 empty wine bottles, the contents of which he drank during my lifetime."