

MAKING BIG GUNS.

How the Government Hurry-Orders For Great War Weapons Are Being Executed.

Down on the meadows of the Passaic, on the shore of Newark Bay, and within the bounds of the city of Newark itself, says the New York Herald, men are working day and night on guns for the Government. The complex and exquisitely adjusted machines that turn and bore "jackets" and "tubes" never stop, except for a "rest" of an hour or so or the replacing of a cutter dulled by hours of slow, steady ploughing through the hardest and finest steel.

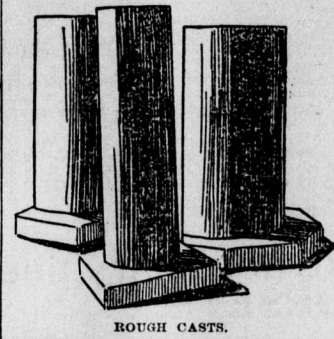
Steel is everywhere, in almost shapeless, oblong ingots, fresh from the casting room; in forged lengths, in cylinders, now bearing some resemblance to a "rapid fire," and in chips and shavings. There are strange and interesting scenes in these gun shops and the pictures presented each hour are dramatic in the extreme. Here in these processes is to be seen the acme of American manufacturing, the great essential fact being the machinery, that is almost automatic in its work, and the few men needed to control and guide it.

Except in the forging room scarcely a blow of a hammer is heard. The shops are almost as silent as the grave. Wheels revolve, cutters turn, men stand placidly by the side of machines, moving softly here and there. All this time, each second, the gun that some day will belch forth fire and steel of its own is coming nearer completion. Chips fall as the bars revolve, but the cutters are not heard. The guns, it would appear to the onlookers, are almost making themselves.

Of the sturdiest type of American mechanics are the men employed. They are workmen who think and who know, men who can judge when a certain instant has arrived, knowing its approach by intuition, rather than

long since relegated to the scrap yards.

Here is the first stage of the modern gun—ragged and rusty metal that is carted in wheelbarrows up to the furnace heat, several thousands of degrees in intensity, stand open to receive it. So overwhelming is this heat that even the master melter has to put on blue glasses to peer into the flames rising

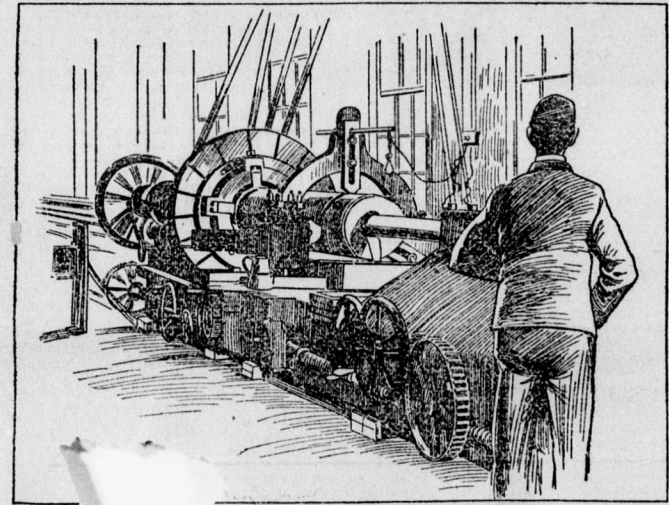


ROUGH CASTS.

over the bubbling sea of metal when the doors are open. When the doors are dropped down—that is, shut—there is only revealed a single spot of brightness, an eye that looks into the furnace's flame, and even this cannot be approached too closely with the naked eye.

Beginning the Gun.

The gun is under way. Ten tons of metal are already in the furnace—a lake of molten, seething metal held in by banks of sand. Other things of steel are to be made of this mass, the gun works being only a portion of the Atha & Illingworth plant. Whether used for peace or war, steel is steel,



BORING MACHINE.

men of brain and muscle. The latter qualities are not so much needed in a gun shop of today. Should a partially finished tube or jacket have to be moved there is the electric traveling crane overhead, that, at the jerk of a cord, swings over its grappling irons, and these need only to be attached. The gun man of to-day needs only to guide and to know.

These works are of the Benjamin Atha & Illingworth Company, one of the three concerns in this country that have the plant and the skill to turn out guns of size. Their main shops are at Harrison, the next station to Newark, and their casting shops across the Passaic, on the "Island." Dozens of pieces for the navy and for coast defence are being made here.

Work of Great Care.

Six weeks is practically the minimum of time for the making of a modern gun, and to finish one within that space everything would have to go marvelously well. The "treatment" of the steel would have to be a success at the very first attempt—something that does not often happen—and the

differing only in quality. It is all "boiled down" in the same way.

In shadow is the casting shop, except when the doors are raised, when a flood of light, a wave of extreme heat, is thrown out. In the dusk of the shadows grimy men raise the sea of metal with long bars. The master melter, never still, steps now and then to his wheels, set at one side of the furnace and looking like the brake wheels on a freight car, and gives one or the other a sharp twist. By this he regulates his fire—five hundred degrees at a twist. The silica bricks with which the furnace is lined can stand four thousand degrees of heat and more before they commence to melt. The master melter runs up the heat to the extreme point and then lets it down.

There are three "heats" a day in the casting shop. Three times metal is heated, three times it is let go with a mighty rush into the casting pot. The last few moments of each heat are the dramatic instants. It is then, at the judgment of the master melter, that the furnace is fed with "medicine," shovelfuls and blocks of metal being tossed in. On this depends the quality, the strength, the elasticity of the steel, essentials of the most vast importance of the gun of to-day.

Into the Casting Pot.

Two hours is usually sufficient for the boiling of this steel in its cradle of sand. At last the one moment arrives. The bar at the furnace's back is worked through the sand to make an opening. An instant, and into the casting pot below the mass runs, scattering millions of sparks, a glowing, golden torrent that foams and hisses as it plunges down.

The picture of the gun's second stage is superb. On every hand fly these sparks, and the mass bubbles and seethes in the casting pot. On its top, through the glow, can be seen a dirty mass—the slag or the scum that is of no use or value. But the picturesqueness of the scene has not ended. The casting process is only half through. The liquid metal must get into its moulds, and that in short order.

On a track the casting pot rests. It is pushed along this track until a gigantic crane overhead seizes it, swinging it aloft. Over mounds of sands it is swung, and the metal, by the movement of a bar, is allowed to drop down in a thin stream. Again shower upon shower of sparks, surrounding the men who, with chains and staves, control a clumsy pot and pull along the line. The grim old shop, with its

floor of sand, its unrelenting dust and and its dreariness, is made into a brilliant cavern for the moment, and the toiling men are supernatural in the light.

In the Rough.

A prosaic time follows, when the metal in the moulds must cool. When the sand is finally knocked away the gun that is to be is only a rough mass of cast steel, indicating only to the expert its fine quality, and not even to him in any degree, for the tests must come to prove that. In the forging shop this mass is hammered and worked until it becomes an octagonal ingot of just twice the weight it will possess when it is finally turned and bored into a "jacket" or a "tube." The hoops, the third part of a gun, are cast and forged hollow, not in solid cylinders, as the jacket and tube are.

With the carrying away of the rough ingot of steel from the forging shop the special work of gun-making commences. The boring and turning factory is the scene of the first step in this process.

Completed guns, ready for mounting and for fire, are not turned out in these gun shops. The finishing touches, the actual putting together of the parts of the gun, the rifling itself, are done at the ordnance works in Washington. It is the business alone of a gun shop to make the steel and to hand over to the army and the navy the three parts of a great gun—the "tube," the "jacket" (which is slipped on over the tube and then "shrunk on" by contraction) and the "hoops," two in number, which, for the purpose of strengthening, are fitted on tightly over the muzzle end of the tubes. Once these three parts are together the metal becomes, practically, one piece and it would be very nearly impossible, by any art or science known to experts, to get the jacket off.

Finished by the Government.

Only the "rough machining," in technical phrase, is done on these guns, this meaning that the final finish and the rifling is put on by the Government itself. "Rough machining" seems, however, a strange term, for if delicate work requiring the utmost accuracy and preciseness is not done here it never was anywhere.

A Checkerboard Fish.

Joseph Evans, of Thirteenth street and Snyder avenue, is the owner of a very queer looking fish. It is four feet long and has a tail two feet in length, which is spotted and striped, like a snake. Evans caught the fish in an oyster dredger while at work on the oyster boat Mary Colman. It lived nearly a day out of water and caused no end of trouble before it finally collapsed. The skin of the strange inhabitant of the deep resembles a checkerboard, being uniformly colored with black and blue squares. Mr. Evans intends having a glass case made for the pretty creature and will exhibit it in his parlor. Several scientific men, who have seen the fish, are at loss as to how to classify it, and all of them agree that a "what-is-it" fish would be the proper name for it.—Philadelphia Record.

Water a Cure For Indigestion.

"We must give special attention to the outside of the body as well as the inside," writes Mrs. S. T. Rorer on "What to Eat When You Have Indigestion," in the Ladies' Home Journal. "The skin must be bathed every morning with tepid water, followed by a brisk rub. This is equally as important as correct diet. A good rule is to use water freely inside and out. At least two quarts of water daily should be taken: half a pint the first thing in the morning and the last at night, a cupful of warm water before each meal, and the remaining quantity divided and taken before meals."

Centennial Celebrations.

This year's crop of centennial celebrations includes observations of the four hundredth anniversaries of Vasco da Gama's discovery of the way to India by way of the Cape of Good Hope, at Lisbon, in May; of the burning of Savonarola at Florence, also in May, and of the birth of Holbein at Basel, in Switzerland. Montpellier will celebrate the hundredth anniversary of the philosopher, Auguste Comte; Ancona that of the poet Leopardi, who was born at Recanati, close by, and Paris that of Michelet, the historian.

Old Bank in Nebraska.

The building in which the oldest bank in Omaha is located is in a very dilapidated condition. The porches



NEBRASKA'S OLDEST BANK.

are tumbling and its windows and tops of the doorways have been taken possession of by the sparrows.

Not only was this the first bank of the town, but the first financial institution under the charter of the Territory of Nebraska. Its president was Thomas H. Benton, son of the Senator. Leroy Tuttle was cashier, and A. N. Wyman teller. In the panic of '57 the doors were closed.

The ancient structure is decidedly picturesque in its dilapidation and has frequently been put into pictures by local artists.

THE FARM GARDEN



Protecting Tree From Mice.

Mice are liable to do much damage unless pretty close watch is kept. Wherever a mouse has been working set a trap and catch him when he comes again. A bit of toasted cheese will tempt him from apple bark every time. If the tree is badly girdled cut grafts from the limbs of the same trees and insert them in both the upper and lower portions of bark around the cut so that a union may be effected. Both will grow together next season.—American Cultivator.

Mineral Manures for Grape Vines.

Grape vines usually need very little manure other than mineral, and that chiefly potash. In European countries it is the habit of vineyardists to burn the prunings each year and apply the ashes. No other fertilizer is used. In fact, stable manures are objected to, as they make the vines grow rank, and the fruit will lack the flavor that belongs to fruits whose vines are only manured with the ashes. Much of the excellence of French wines is possibly due to this sparing use of manure.—Boston Cultivator.

New Varieties of Potatoes.

In choosing varieties of potatoes for spring planting it is advisable to select those that have been recently produced from seed, provided, of course, that their quality and productiveness have been tested and are generally known. The variety that is newly produced from seed is generally more vigorous than that it is likely to be after a few years' contest with the potato bugs, and the blight and rots which all help to decrease potato vigor and productiveness. But it is not advisable to plant potatoes, however good, which are very unlike standard sorts, and whose good qualities are not generally known. There is so much difference in potatoes that the mere fact that a potato is a potato is not enough with most consumers to secure a market for it until after they have given it a trial.

Potato Planting.

It is said that two ounces corrosive sublimate dissolved in one gallon of water in an earthen vessel of some kind and this turned into a tight barrel with fifteen gallons of water will make a preparation that will destroy the germs that produce the scab on the potato. If the seed potatoes are put in sacks and one sack full at a time be dipped in this diluted solution until the potatoes are entirely covered and allowed to remain one and one-half hours, the germs will be destroyed. The potatoes should be then removed, drained and spread out to dry, and when thoroughly dried they will be ready to cut and plant at any time. As the solution is very poisonous it should be kept in earthen or wooden vessels, as it will quickly corrode iron, steel or tin. The amount named will be sufficient to treat from five to eight barrels.

Growing Cauliflower.

Considerable effort has been put forward by some writers to make it appear that the successful growing of cauliflower was a difficult operation, but as a matter of fact any soil that will grow good cabbages will grow good cauliflower. If early crops are wanted the seed must be sown in February and transplanted into shallow flats as soon as the second leaf shows; the soil in the flat should be rich. Air, water and keep at the same temperature as for young cabbages. Plant in the open ground as early as possible, not later than the middle of April, if it can be avoided. The soil should be rich and deep, using a handful of fine bonemeal mixed with the soil about each plant as it is set. Cultivate carefully each week. Hot weather injures the crop greatly, so to be successful with it one should grow only for an early and a late crop, avoiding the mid-season crop. For the late crop the treatment is about the same as for late cabbages. The main points to be observed in the culture of cauliflower is to have the soil rich and to keep it well cultivated during the season of growth.

How to Prune Fruit Trees.

It is a lamentable fact that not one man in a hundred, fruitgrowers included, knows how to prune a fruit tree properly. In the first place, fruit trees require a very little pruning, and the old idea that large quantities of the inside branches should be cut out "to let in the air and sunshine" is nonsense. The pruning of trees should be done on a scientific plan in so far that there should be a good reason for every cut that is made. Every floral bearing fruit tree sends out little branches or spurs on the sides of all limbs and small branches, and these should never be cut off, nor should they be injured when the fruit is being gathered or in any other way, for these spores produce the fruit buds for the coming season's crop. Every tree which needs pruning should be

HOW DO THE FLOWERS GROW?

"Oh, Sage, in wondrous wisdom old,
Tell me how the flowers do grow—
Whence come the colors, purple, gold,
In which they rise, and bloom and glow?"

"My child, the flowers are words of God
Sown in seeds of silent good,
They draw their strength from 'neath the
Soil
But Heaven sends them daily food.

"The sun, the moon, the stars conspire
To make them live and bud and blow,
The breezes help them to aspire,
And dews perfume them as they grow

"But 'tis the rainbow from the skies,
Broken by the Iain King's blow,
That sprinkles them with heavenly dyes
And makes them with such sly spender
glow."

—Rev. S. W. Small, in How to Grow Flowers.

HUMOROUS.

The Kindly Man—Why stand ye idle here? The Other Man—De benches in de park's bein' painted—see?

Hojack—Why are you consulting the dictionary, Tomdik? I thought you knew how to spell. Tomdik—I do. I am not looking for information, but for corroboration.

Teacher—You are painfully slow with figures, Tommy. Come, now, speak up quickly. If your father gave you mother a \$50 and a \$20 bill, what would she have? Tommy—A fit.

"Darling, please answer me," he moaned as he stood in the centre of the parlor. "I am on the rack." "So is your hat," shouted the old gentleman, who had a gallery seat on the stairway.

Foxey—Did you see the Borems a card for your mus? Mrs. Foxey—Yes; how could I get out of it? Foxey—Well, V. S. Borem that Smith is going to come. Borem owes him money.

Billy Blink (boxing instructor)—Great Scott! That was an "outer" you gave me. But what's that in your glove, I say? Amateur (just learning)—Oh, that's a horseshoe—I put it there for luck.

Judge—The officer says you were drunk and disorderly. What have you to say for yourself? The Culprit—Drunk, perhaps, your honor, but not disorderly. A drunk is always in order with me.

"Do you really mean to stand by what you say about retiring from public life?" inquired the intimate friend just before an election. "How do I know?" responded the politician. "I'm no prophet."

Ethel—Isn't it strange that Flossie attracts such intellectual men? Maud—Oh, no; she told me she always planned her gowns when they talk to her, and that gives her face that interested expression.

"I trust," she said, patronizingly, "that you are a true artist—that you confine your efforts to an elevated plane." "Assuredly, I do, madam," was the reply. "I am a freecorer and invariably work with a ladder."

Cholly—Maud has to wear glasses; the oculist says she has been using her eyes too much. Charley—I should say so! You ought to have seen her at the dance the other night; she was just surrounded by men all the time.

"Mamma," said the little girl, when the steamer was three days out. "Well, darling?" said the indulgent mother. "Mamma, don't you think we've sat in this place long enough? Let's move round to the front porch."

Ethel—Why didn't you attend Professor Dump's lecture on the "Cycles of time?" It was very interesting. Maud—The subject of the lecture was embarrassing to me. You know, dear, I bought my wheel on the installment plan.

She—Ah, count, you don't know how my love for you distresses my parents! I heard my father say this morning that he would give \$50,000 if I could never see you again. The Count—Ees your fazeire in hees offices now, you sink?

Mrs. Hussel (of Chicago)—Why, there's another of those signs, "Tailor to H. R. H., the Prince of Wales!" Does it take all the tailors in London to keep him in clothes? Mr. Hussel—Maybe he owes 'em all bills, and has to go from one to another.

"My friends," said the minister, earnestly, "let us beware of Satan. We know that he scatters tacks along the narrow way in order that the just may puncture their tires. And as the congregation pedaled homeward, many a member thought of the pastor's words.

He—I wonder what the meaning of that picture is? The youth and the maiden are in a tender attitude. She—Oh, don't you see? He has just asked her to marry him, and she is accepting him. How sweet! What does the artist call the picture? He (looking about)—Oh, I see! It's written on a card at the bottom, "Sold."

A Kid-Raising Experiment.

An interesting stock-raising experiment was inaugurated Tuesday when C. S. Onderdonk of Philadelphia took a lease on the Canada de Los Alamos (New Mexico) grant of 15,000 acres, near Lamy Junction, which he will at once stock with goats. Five thousand goats will be placed on the land at once and as many more in the spring, and if the experiment proves a success other grants are to be leased and stocked. The object is to produce pelts to supply kid-glove manufacturers. French experts say that northern New Mexico and southern Colorado, owing to the dryness of the atmosphere and the constant sunshine, produce finer-grained and tougher pelts than any other part of the world, and for this reason goatskins from this section command a high premium in the Eastern and foreign markets.—St. Louis Globe-Democrat.