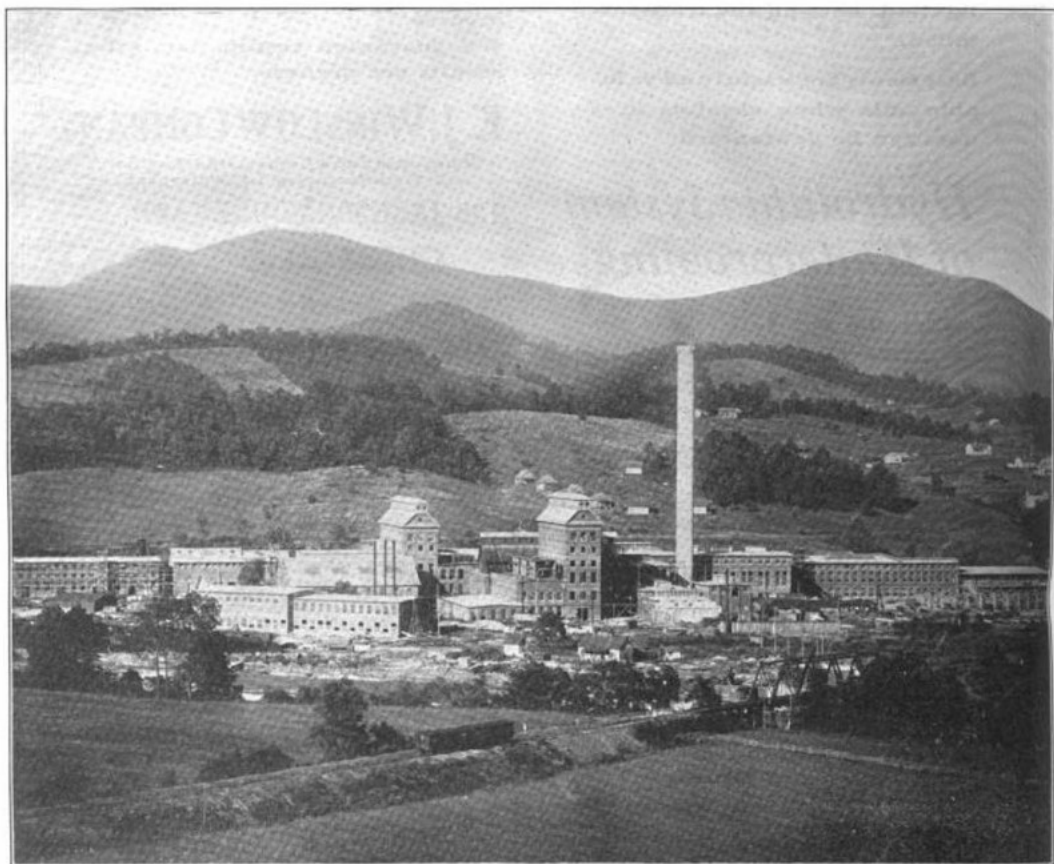


A NOTABLE EXAMPLE OF THE EFFICIENCY OF THE GILBRETH SYSTEM AND THE SUPREMACY OF THE GILBRETH ORGANIZATION.

No better evidence can be desired of the efficiency and dependableness of a system that has attained world-wide renown, than the work on the thirty-five buildings of the Champion Fibre Co.'s plant at Canton, N. C., the largest wood pulp plant in the world representing an outlay of over \$2,000,000.00, described elsewhere in this issue of the Manufacturers' Record.



CHAMPION FIBRE CO.'S PLANT, CANTON, N. C.

The cost-plus-a-fixed-sum contract is again proven the most satisfactory in every way.

As usual at the time the contract was awarded the plans for the plant were not completed, the only preliminaries necessary to settle before the work was commenced were an approximate idea of the cost and scope of the work. Under this system, as the job progresses, the plans can be made or changed to meet conditions that arise.

FRANK B. GILBRETH
GENERAL CONTRACTOR
TOWNS BUILT TO ORDER

A NOTABLE EXAMPLE OF THE EFFICIENCY OF THE GILBRETH SYSTEM AND THE SUPREMACY OF THE GILBRETH ORGANIZATION.

Since adopting the cost-plus-a-fixed-sum contract exclusively, our own business has increased enormously—to such an extent, in fact, that there is hardly a State that does not contain numerous buildings, dams or other structures that have been built by the Gilbreth organization. Indeed, the success of the cost-plus-a-fixed-sum contract has been so pronounced that the past year or two has brought many imitators into the field, some of whom are bringing this form of contract into bad repute, simply for the reason that, while they imitate our form of contract, they cannot successfully imitate the Gilbreth System, and having no adequate organization or system for handling work to advantage under this form of contract, they fail to secure its benefits.

The owner who intends to build wants, first of all, a structure that will not fall down. He wants it at reasonable cost and, in nearly every case, he wants it in a hurry. If he expects to get all of this he should, before signing a cost-plus-a-fixed-sum contract, make the contractor show him all of the details of his system. He should make sure that he has ample facilities for keeping in touch with the material markets and for securing labor, and that he has a system that enables him to get his material on the ground at the time it is needed; a system that renders it impossible for the owner to pay for short weight or measure or defective materials; a system that automatically anticipates difficulties and forestalls delays; a system that enables the owner to ascertain instantly exactly how much money has been spent to date, how much liability has been incurred and whether the cost of the operation is running ahead of or behind the estimate.

The owner should be able to put his hand instantly on the record of every transaction and trace the history of every item of expense and the disposition of every five-cent piece. Without a system of this kind the contractor is not a safe man to handle the work of any owner who wants to be assured of getting full value for every dollar he spends.

The fact that most of the work of the Gilbreth organization is on repeat orders is the strongest proof that it assures the owner who takes advantage of it the highest efficiency and absolute protection at every point.

FRANK B. GILBRETH
GENERAL CONTRACTOR
TOWNS BUILT TO ORDER

Diamond Shoals, constitutes the bete noir of the men who sail the Southern seas. When the Panama canal is completed and Colon becomes, as it indubitably will become, the greatest coaling station in the world, Clinchfield coal will furnish an important part of the traffic.

It is expected to have the line from Dante to Bostic completed by the first of 1909, and to meet its demand for traffic it is the intention to have the mines now opened and being opened ready to furnish a coal production sufficient to meet an enormous trade. To do this will, of course, require active work in opening up operations and increasing the output of these already on a producing basis, but large as the undertaking is, the Clinchfield Coal Corporation has started out with the in-

standing until such time as a better means for reaching markets should be furnished than that of floating out saw logs upon the swollen waters of the mountain streams. With the coal and lumber developments that the next few years will bring there will be a large influx of people into the country pierced by the road, now for the most part but sparsely settled, and the incoming freight will give the road a large traffic also. So that, taken all in all, the future for even so expensive a railroad as the South & Western seems assured, and the judgment of its backers and builders will no doubt be amply vindicated.

The road is backed by Thomas F. Ryan, James A. Blair, T. Jefferson Coolidge, Norman B. Ream and their associates among the moneyed men of the country.

NORTH CAROLINA'S GREAT WOOD-PULP PLANT.

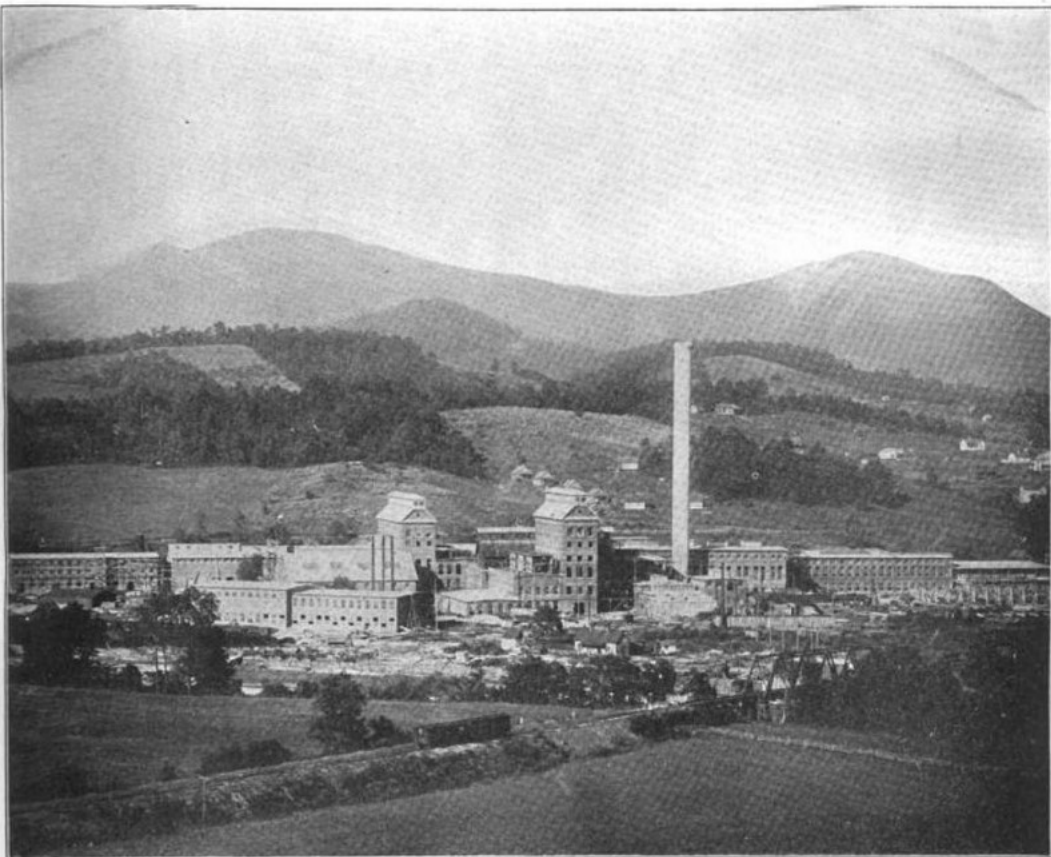
[Special Correspondence Manufacturers' Record.]

Canton, N. C., January 2.

At this inland mountain town of Western North Carolina, and literally "in the woods," there is just being completed one of the most notable developments in an industrial line the South contains, for here is being built, at an aggregate cost of at least \$2,000,000, the largest wood-pulp plant in the country, if not in the world, with buildings like skyscrapers, of concrete, steel and brick, 35 in number, and creating offhand a new industrial city. The plant is the property of the Champion Fiber Co., and all the pulp manufactured—the capacity being 250 tons a day

created for housing the workmen, covers about 40 acres of the stretch of valley that lies between the mountain ranges. On the south side of the railroad about 10 acres will be used as a terminal for the branch railroad that will bring the wood down from the Champion Fiber Co.'s timber reserves, from which it will be taken by wood conveyors over to the manufacturing plant proper.

The Champion Fiber Co. has secured immense tracts of timber lands in this section, the boundaries including some 40,000 acres. These boundaries extend southwest from the limits of the Biltmore



VIEW OF COMPLETED PLANT OF CHAMPION FIBER CO., CANTON, N. C.

tention to accomplish it, and will no doubt be ready with the coal when the road is ready with the cars and the motive power and the track. Experts who have calculated the quantity of coal in the holdings of the Clinchfield company say they contain 10,000,000,000 tons. This would furnish the road 10,000,000 tons of freight annually for 1000 years.

In addition to the great amount of coal which it will have to haul, this road will have an immense lumber traffic for a number of years. There is a large amount of virgin forest upon its line, and a still larger acreage of that from which only the best of the poplar and other valuable woods has been removed, leaving hundreds of millions of feet of merchantable timber

The president of the company is George L. Carter, a native of Virginia, and at present a resident of this place. M. J. Caples, for years with the Norfolk & Western, is general manager, and he also resides here, where the general offices are located. In backing, building and operating, the road has money, brains and ability.

GEO. BYRNE.

The value of the South's cotton crop for the last six years exceeds the value of the total gold and silver production of the world for the same period by the sum of \$1,000,000,000. If every dollar of gold annually mined on earth were poured into the South it would not pay the South's yearly bill against Europe for cotton. Do you wonder that the South is getting rich?

—will go to the finishing mills at Hamilton, Ohio, of the Champion Coated Paper Co., the parent corporation. This vast development, which would be an enterprise of the first importance if located anywhere in the United States, or the world for that matter, is an illustration of how vigorously though quietly great enterprises are being established in the South. At the same time it is a demonstration of the growing necessity for the broadest possible increase of railway transportation facilities for the entire South.

Canton is in Haywood county, on the Murphy branch of the Southern Railway, 18 miles from Asheville. The site of the plant, with the small town that has been

estate and contain all sorts of lumber. Although not generally known in years past, it seems that the high ridges of these mountains grow a species of timber similar to the spruce of Northern Maine, Michigan and Wisconsin, as the elevation of these mountains make the climatic conditions practically the same.

The main timber reserves of the Champion Fiber Co. are located about 18 miles from Canton, up the Little Pigeon river, through an extremely inaccessible country. The headquarters of what they call the "woods department" is a recently-organized postoffice town by the name of Sunburst, the population of which is made up entirely of the workers of the Champion Fiber Co., who will get out the

timber to send down to the mill at Canton.

The timber will be sent down by means of a standard-gauge railroad extending from Sunburst to Canton, the work on which is nearly completed and the equipment already purchased.

In connection with the timber hauling a passenger service will be given, and at some future time a connection will be made with some of the branches of the Southern Railroad.

It is the reported intention of the Champion Fiber Co. to use its own timber reserves in modest quantities for the time being, owing to the fact that they are able to purchase near Canton, at least within easy access of railroad facilities, a great quantity of timber which can be used in the manufacture of pulp. When this sup-

ply is exhausted they will have their own reserves to fall back on, which contain a supply, it is estimated, of over 45 years.

There will be used in the making of the pulp the two processes of soda and sulphite. In connection also with this plant an interesting feature is a complete extract plant, which in itself is one of the largest in the South. By a process said to be the Champion Fiber Co.'s exclusive property they are able to run chestnut and oak wood through this extract department, extracting the tannic acid therefrom for the use of tanneries throughout the country. This will be shipped in a condensed form, which in itself is an advance over the manufacture heretofore. This leaves them the wood

from which the tannic acid has been extracted for use in the making of pulp, which will go through the soda process. Thus there will be absolutely no waste in connection with their manufacture.

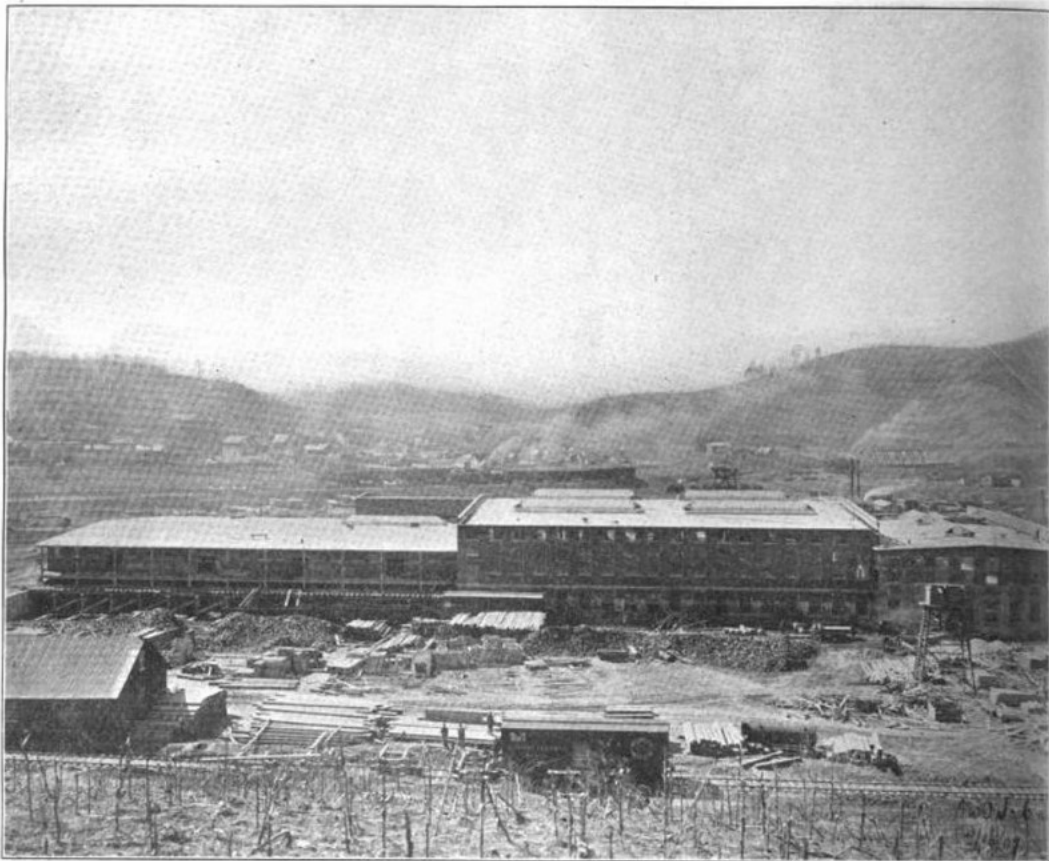
In connection with this plant there has been erected a pumping station, located on the Little Pigeon river, which borders on the site. This is for the fire protection of the plant, as there are no fire departments or water in the little town of Canton. This was made necessary for fire insurance purposes. This pumping station supplies water to a concrete reservoir which is built on one of the neighboring high hills and at an elevation of about 90 feet above the top of the highest buildings, the digester buildings, which extend up from the grade line 122 feet, and from

such a plant extending over such an area, it should be remembered that in the process of manufacturing pulp machinery is the greatest factor, and every sort of labor-saving device known up to date has been put in this plant.

Owing to the fact that when construction work was started the town proper of Canton consisted of a few little nondescript buildings bordering on a muddy wagon road leading off from the Southern Railroad's track, there were practically no facilities for quartering mechanics and laborers used in the construction of the plant, nor were there, of course, adequate facilities for housing the men who would be employed in the plant when it started running. Therefore it was necessary for the Champion Fiber Co. to lay out on its

entire plant—the organization of which Mr. Frank B. Gilbreth of New York City is at the head—carried on the gigantic work in the heart of the North Carolina mountains, 800 miles from his executive offices. This story, on request, was furnished by one of the men of the firm, who has been most actively identified with the work. In his letter he says:

"In the first place, as is usual, the site was visited by the head of the firm, Mr. Gilbreth, just before the start, and at the time the contract was awarded the plans for the plant were not completed. It was then that the study of local conditions was made, which, of course, included the examination of the site and the surroundings, of immediate local conditions and the accessibility of railroad facilities,



BIRD'S-EYE VIEW OF CHAMPION FIBER CO.'S PLANT IN COURSE OF CONSTRUCTION.

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this reservoir the water will be supplied to a thoroughly-equipped system of distributing mains which are laid all over the plant and adjoining the buildings, each individual building being supplied with these fire-protection pipes. A system of hydrants is, of course, used in connection with this fire-protection system.

All the buildings which require them are supplied with direct receiving and shipping tracks on the ground or trestles, as it may be, and there will be in addition several miles of siding tracks in and about the building site.

The plant when in operation, which will probably be in February, will employ between 400 and 500 men. While this seems a small number of employees for

own property quite a small town of frame houses for its own use. These houses, or cottages, as they might be called, are picturesquely located on the west shore of the Pigeon river, about one-eighth of a mile from the plant itself, but screened from it by a ridge of trees, which makes it as attractive a place as some of the suburban developments outside of large cities. The houses themselves are attractive, and are of a much better design and construction than can be found anywhere (outside of Asheville) in the western part of North Carolina.

Outside of the interest that attaches to this mammoth plant as a new Southern enterprise, there is a good story in the methods by which the contractor for the

local supply of horses, teams, and means of conveying freight material; the study of weather conditions we were able to have during the course of this construction, which, as you will notice, makes a great deal of difference in constructing work; the accessibility and advisability of securing materials we could locally, as well as a thorough examination of the labor situation, not only as to laborers, but as to the organized-labor conditions in connection with mechanics, etc. The facilities for housing men of course had to be considered, as well as the opportunities for securing within a radius of 100 miles, let us say, of plant equipment and for repairing plant. While this was being done, almost simultaneously we should

say, the job was being organized and preparations made for quickly starting the work and the rapid prosecution thereof. The organization was being gathered together, ready to be sent upon notice from this office, plant layout was made, methods of construction studied and determined and the organization system charts laid out.

"The plant was then rushed to the site, our organization meanwhile gathering there from all points of the compass from our reserve forces, as well as other contractors which were nearing completion at that time.

"An interesting feature came up, owing to the fact that it was originally intended to use mass concrete footings for the entire plant; but after we had made tests

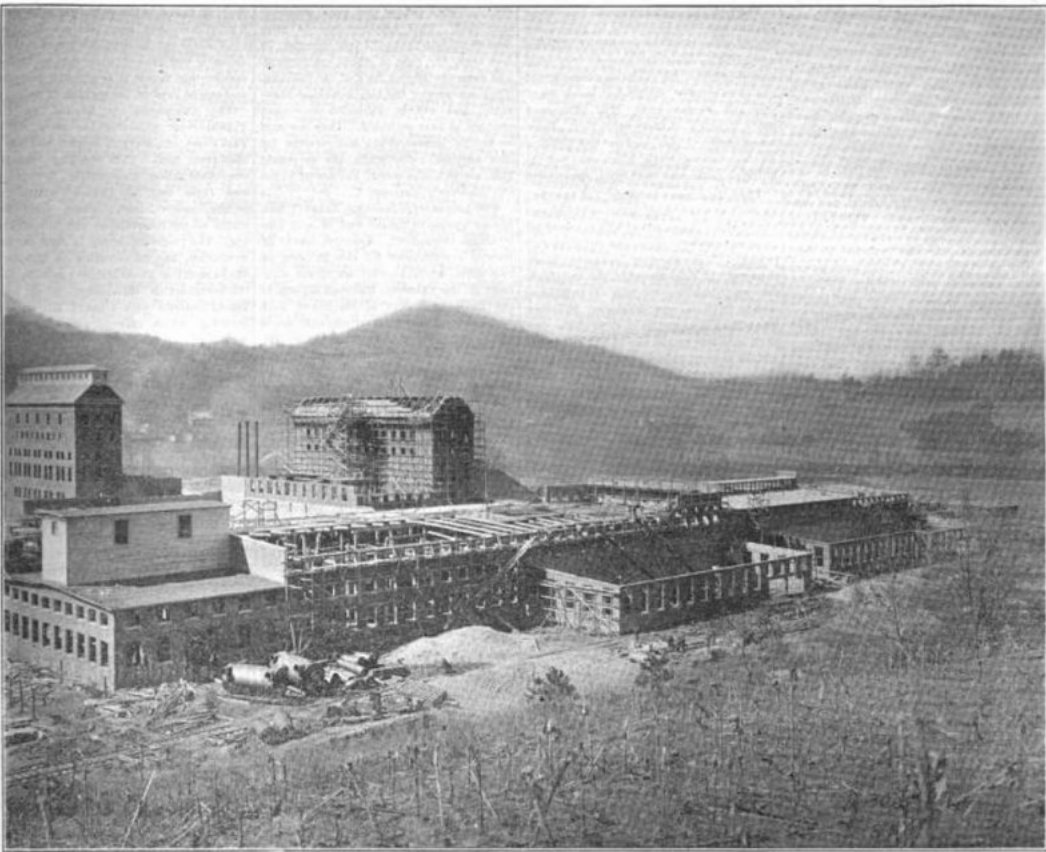
secure speed—which has been the factor in securing the reputation we have for dependable speed—we arranged the work so that athletic contests could be secured between equal gangs of men under the same actual working conditions. This first applied particularly to the driving of piles. We organized five crews and grouped them by nationalities where it was possible, and if not, by the localities from which the men came. The driver which drove the greatest number of piles each day was awarded the flag. This showed the entire job that they were the star crew, and as at that time there were nearly 800 men at work, it was considered more of an honor and more of an incentive than you can believe to have this flag flying at the head of this particular crew's driver. We had

that much ahead of any other crew. The superintendent had to be there to say 'Go!'

"We took advantage of the immediate local conditions, inasmuch as we secured sand and gravel for nearly all the concrete work, including the reinforced concrete, right on the site, which we handled with up-to-date methods. The gravel had to be teamed over the river, across a bridge which was washed out at one time owing to a freshet in the river. The wagons were loaded by a team-loading device. Drag scrapers were used to bring the sand up, drop it in an overhead hopper, and from thence into the loading teams at the will of the driver who operated the chute handle.

"The same method was used in collect-

western part of North Carolina, not only owing to the sparsely-settled country we were working in, but owing to the fact that the demand for labor was so great throughout the entire country. We scoured the entire country for miles around, with but little results. It therefore became necessary to bring in several hundred Italian laborers and quarter them immediately on the site, despite the opposition we received from local sentiment, which was decidedly against the importation of foreign labor, particularly Italians. They even went so far as to threaten dire results should we bring 'dagos' into the mountain, but we overcame this by sending a strong advance guard, and the Italians made friends so easily that no trouble of any account oc-



BIRD'S-EYE VIEW OF CHAMPION FIBER CO.'S PLANT IN COURSE OF CONSTRUCTION.

of the soil-bearing capacity at the site, it became necessary to drive piles for the entire foundation. This was an immense job in itself, as nearly 40 miles of piles (linear measure) had to be driven. This did not affect our organization on the ground, for we are prepared to meet all difficulties, and five drivers were immediately made up, castings for same telegraphed for, and in a short time five drivers, manned by local men mostly, who had never seen a driver before, were at work at the site. You can imagine the difficulties we were in in putting in these foundations, as the water came up into the excavations for the footings.

"Another interesting feature might be mentioned in the fact that in order to

one Irish crew at work, and while they were green men they worked themselves blue in the face in order to capture the flag, which they soon did, and were awarded a beautiful green silk flag with a harp thereon. It may be interesting to tell you that no other flag was posted after this one was set up, as this same crew held the record during the entire job.

"This particular contest became so interesting that the superintendent himself had to get on the job an hour before starting time in order to watch the crews, as the rivalry was so great that they would persist in starting before the time, taking advantage of other crews, if possible, by getting up steam, sliding the machine over to the driving point so that they would be

ing the gravel and delivering it to a large rotary screen, which screened it to the proper sizes for the concrete uses we put it to.

"We secured a great amount of timber direct from the woods of the Champion Fiber Co. at Sunburst, 18 miles away; and while there was a sawmill there which took care of the sawing of the logs to the various sizes, we also had an up-to-date equipment on the job. This is doing business on a wholesale scale and is right where the stuff is wanted. No waste occurred and delays were eliminated. Furthermore, we had everything entirely in our control.

"We found all kinds of mechanics and even laborers extremely hard to get in the

listed after the first few rough-and-tumble battles had occurred around the shanties.

"We of course had to put in a complete commissary department to take care of so many, and this in itself was quite an undertaking. We also had to import mechanics of all kinds, getting bricklayers as far East as Boston and as far West as Chicago. Carpenters, etc., came from as widely-separated places. These also had to be housed immediately on the site, owing to the absence of local quarters, and commissary arrangements had to, of course, be made separately, as these men were of a higher class. The mechanics' commissary was quite a building in itself.

"During the progress of this work we received and used an immense amount of

material, there being over 10,000,000 brick used in the plant and nearly 50,000 barrels of cement.

"During the course of the operation we received nearly 4000 cars of material, and you can easily see what an immense amount of stuff we had to take care of, and you will also note that it was a problem in itself for the Murphy branch of the Southern Railroad to handle this as we required it, as we do not suppose that they handled the same amount of traffic on the same road during the previous three years.

"We had nearly three miles of railroad tracks and siding immediately on the site during the construction work and were able to unload material the shortest possible distance from where it was to be actually put in place. We of course had to keep large stocks of all kinds of material on hand."

In order that a more definite idea may be had of the character, extent and equipment of the many varied buildings included in such a large plant of this kind, a brief reference has been prepared showing the principal features of each structure.

The boiler-house, 72x184 feet, is two stories in height, with brick walls, reinforced concrete floors throughout, and concrete roof on steel trusses. This building contains a Berquist coal bunker of 10,000 tons capacity. It also contains 10 batteries of Heine boilers, 632 horse-power each, provided with Murphy automatically-stoked furnaces. The coal supply for this boiler-house comes in directly beside the building, on a railroad trestle, and is dropped by cars into a reinforced concrete coal bunker of over 2000 tons capacity. From there it is carried automatically by a conveyor to the bunkers, which are directly over the boilers, from where it is distributed automatically to the automatically-stoked furnaces. The ashes are dropped into reinforced concrete pits, and from there taken and loaded into cars automatically by a conveying apparatus.

The generator-room, 144x53 feet and 53x27 feet, is two stories in height, with brick walls and steel-truss roof. The second floor is of reinforced concrete on steel beams, the loadings of floor being extremely heavy. This building also contains three large electric generating units and a 35-ton traveling crane. Over 1500 cubic yards of solid concrete masonry was used on the ground floor for machinery foundations.

The sulphite digester is 118x53x122 feet high, and contains several stories. The three heavy steel digesters in this building are 16 feet in diameter by 54 feet high. The chip bins are located overhead as usual.

The sulphite blow-tank building, 46x118 feet, is one story and of mill construction, the apparatus in the interior being supported by heavy steel construction. It contains three blow tanks 32 feet in diameter and 22 feet high.

The soda-evaporator room, 45x92 feet, is one story, of brick construction with wooden roof, and contains a battery comprising four evaporators 9 feet in diameter by 17 feet long.

The reclaiming-room is 96x120 feet, and contains the battery of 12 bleaching cells, together with the liquor tanks in connection with them. It is equipped with five 72-inch by 18-foot boilers and five rotary furnaces, together with fireboxes for same. The smoke flue, which is 14 feet in diameter, is connected up to the boilers and equipped with mechanical draft. The ash storage bins are supported by structural steel supports directly over the bleaching cells. The building is one

story, very high, with steel-truss roof, concrete covered.

The causticizing room, 108 feet by 74 feet 6 inches, is two stories, with steel-truss roof covered with concrete, and first and second floors are of reinforced concrete. This room contains the causticizing tanks, which are 26 in number, 15 feet 6 inches diameter, half of them being for the strong liquor storage and half for the weak liquor storage.

The chemical storage room, 125x75 feet, is two stories in height, with second floor of reinforced concrete. Part of the building is three stories high, the three floors of which contain the lime storage. In the second floor of this building pin-connected girder-frames, supplied by the General Fireproofing Co. of Youngstown, Ohio, were used.

The soda blow tank and washing room, 28x146 feet, is two stories in height, the second floor being of reinforced concrete supported by steel "I" beams. The massive ventilators for the blow tanks, which are 12 in number, are 16 feet inside diameter and 90 feet high. The blow tank has a capacity of 6508 cubic feet. Reinforced concrete was used in this building for foundations, walls, piers, etc., for the different tanks and mechanical equipment.

The soda digester building, 146 feet long by 54 feet wide, is of brick, with several intermediate floors, all of which are of reinforced concrete supported by steel "I" beams. This building contains seven digesters, 10 feet diameter, 54 feet high, set on massive concrete foundations, which, in turn, are supported by piles. They have a capacity of 3284 cubic feet each, and this makes one of the largest, if not the largest, soda digester in the United States. Above these digesters are large chip bins, which have a capacity of 62,500 cubic feet. The monitor for ventilation surmounts the whole building, which is 122 feet high, or about the height of a 12-story office building. The liquor tanks are contained in this building up above the digesters themselves.

The bleach-making building, 85x37 feet, is three stories in height, and is constructed of reinforced concrete except the roof, which is of wood construction. The bleach settling and the bleach storing tanks are all made out of reinforced concrete, with the walls heavily waterproofed. On one side they extend over 18 feet in height. Shipping tracks are alongside.

The screen room, 161x73 feet, is two and three stories in height, the second and third floors being of reinforced concrete and the roof of wood supported by steel trusses. This room contains rifiers and baffles, tank, etc., all of which are made of reinforced concrete; the only things not of this material in this room are the machines themselves.

The beater-room building, 78x140 feet, is two stories in height; the second floor is of reinforced concrete, and the roof is supported on steel trusses. This room contains the beaters for the plant, and on the first floor the sulphite wet machines are located, together with the filters and stuff chests, all of which are of reinforced concrete, a decided departure from the old fittings of a pulp plant. These stuff chests are subjected to extremes of heat and cold.

The machine-room, 161x228 feet, is two stories in height, the second floor of reinforced concrete and the roof of wood supported by steel trusses. The second floor of this building contains the soda pulp-drying machines, sulphite pulp-drying machines and the board machines, the latter being a 70-inch machine with driers, one of the largest installed in a pulp plant up to date. Reinforced-concrete waterproof troughs are underneath both the dry and the wet machines. The floor loadings of

this building are in excess of 400 pounds per square foot.

The filter-house building, 163 feet long by 56 feet wide, is two stories in height, with wood roof and large skylights. The interior of the building contains a large sedimentation basin, which runs half its length and across the entire width of the building. This calls for heavy waterproofing of the walls to stand the water pressure. The balance of the building on the first floor consists of reinforced concrete filter tanks, which will contain in the process of making paper both hot and cold water, subjecting the concrete to severe tests; in fact, the extremes of hot and cold with the loadings on the top of these tanks make the requirements particularly severe.

The pulp-bleaching room, 155x96 feet, is two stories in height, with reinforced concrete second floor and wood construction roof. This building has 24 reinforced-concrete tanks, 17 feet diameter, 24 feet high, the tops of which are covered, and form the second floor of the building. They are part of the bleach-making apparatus, and will be subjected to violent changes of heat and cold. They are said to be the largest tanks ever erected for this purpose. The walls are extremely thin, six inches in width, and are of necessity absolutely waterproof.

The pulp-storage building, 111x177 feet, is two stories in height and of mill construction throughout. Separate tracks on trestles are provided for this building on two sides, which provide for direct shipment to the Southern Railroad sidings of the finished product of the entire mill, which during the course of manufacture is finally deposited in this storage-house. Being a storage for paper, the floor loads are excessive, and are designed for a live load of from 500 to 600 pounds per square foot.

The acid plant contains the following buildings: Line-sheking and storage, two stories, 82x53 feet; motor building, one story, 40x40 feet; sulphur-burning room, one story, 30x53 feet; sulphur storage, one story, 30x53 feet; line storage, one story, 40x48 feet. These are all constructed of concrete and steel, and in addition there are three large reinforced-concrete tanks, each 28 feet in diameter and 20 feet high.

The extract department includes the following structures: Boiler-house, two stories, 85x146 feet; harking-room, two sto-

ries, 46x167 feet; regrinder-room, two stories, 75x85 feet; rough leaching building, two stories, 86x134 feet; chipping-room, two stories, 50x143 feet; pulp-leaching building, two stories, 86x258 feet, and evaporator-room, one story, 40x86 feet. These buildings are all of mill construction with the exception of the boiler-house, which is built of concrete and steel. Altogether in the rough and pulp-leaching buildings there are 88 reinforced-concrete tanks, each 17 feet in diameter and 22 feet high.

The evaporator room contains four large copper evaporators and various other apparatus which will evaporate the product of the extract department and will enable them to ship it to the tanning factories direct in a condensed form. The by-product of this department, if such it could be called, is the pulp from which the tannic acid has been extracted. This wood could not be used for paper-making unless it had gone through this operation, and by this means it is already prepared and can be used in the making of pulp.

The pump-house is located on the Pigeon river adjoining the site. It is 21x54 feet, one story in height, and has a steel-truss roof. This building contains one 1500-gallon underwriter fire pump and three sets of 15-inch centrifugal pumps, motor-driven. These force the water to the reservoir on the hill adjoining. The reservoir, which is used for fire protection, has an elevation of 285 feet. Its capacity is about 200,000 gallons, and its construction throughout is of reinforced concrete with a heavy timber roof covering, which extends over the whole structure.

Other important buildings at this plant include the bleach storage-room, two stories in height, 54x129 feet; two wood-preparing buildings, each two stories in height and 80x100 and 75x100 feet, and one-story machine shop, 54x162 feet, and all of these being of mill construction.

The massive smokestack is 250 feet high, with an outside diameter of 17 feet and inside diameter of 14 feet, and it is of reinforced-concrete construction throughout.

Altogether there are about one mile and a half of shipping and receiving trestles in connection with the plant, each of the buildings in which shipping facilities are needed having these trestles along its side.

JACKSONVILLE'S PROGRESS FROM DISASTER.

[Special Correspondence Manufacturers' Record.]

Jacksonville, Fla., December 30.

That fire is the greatest builder of cities Jacksonville joins with Chicago, Baltimore and other cities with fire experience to demonstrate. In May, 1901, a most destructive conflagration swept this city, and before it could be checked 20,000 dwellings and business houses had fallen in ruins, with an approximate money loss of \$15,000,000. Almost before the blaze died away, and long before the debris had ceased smoldering and smoking, the plucky people were laying plans, and even foundations, for larger, better and more costly buildings to take the place of those destroyed. Since that time more than 7000 buildings have been erected, most of them of wood, but many of brick and stone and cement, the total cost being \$27,500,000. The buildings destroyed were for the most part old and out of date; those that have arisen upon their ancient sites are handsome modern affairs, substantially erected and fully equipped with all the up-to-date appliances. So that the fire indirectly changed the entire appearance of the place from that of a ragged, old-style town to that of a strictly modern city. Nor has the building era yet reached its first halt-

ing place. There are now being constructed, or planned for construction in the immediate future, with every evidence of early completion, buildings to cost \$12,000,000. Nor is this building boom lacking in solid and substantial backing. In other things strides fully commensurate have been and are being taken.

In point of population the increase has been proportionately large. In 1890 the census gave Jacksonville a population of 17,000; in 1900 this had increased to 28,000. A careful census taken last year developed the fact that the permanent population here was 51,805. In addition to this, which is entirely within the city, there is a large suburban population, estimated to reach 10,000, mostly dependent upon the city for employment and sustenance. In the winter months an added visiting population of at least 40,000 gives the city the appearance of a place of 100,000 people.

The increase in the number of manufacturing enterprises in the past few years has also been very rapid. In 1900 there were in Jacksonville 74 such concerns, employing 1508 operatives, paying them in wages \$509,754 annually, disbursing in other expenses \$132,917 and turning out