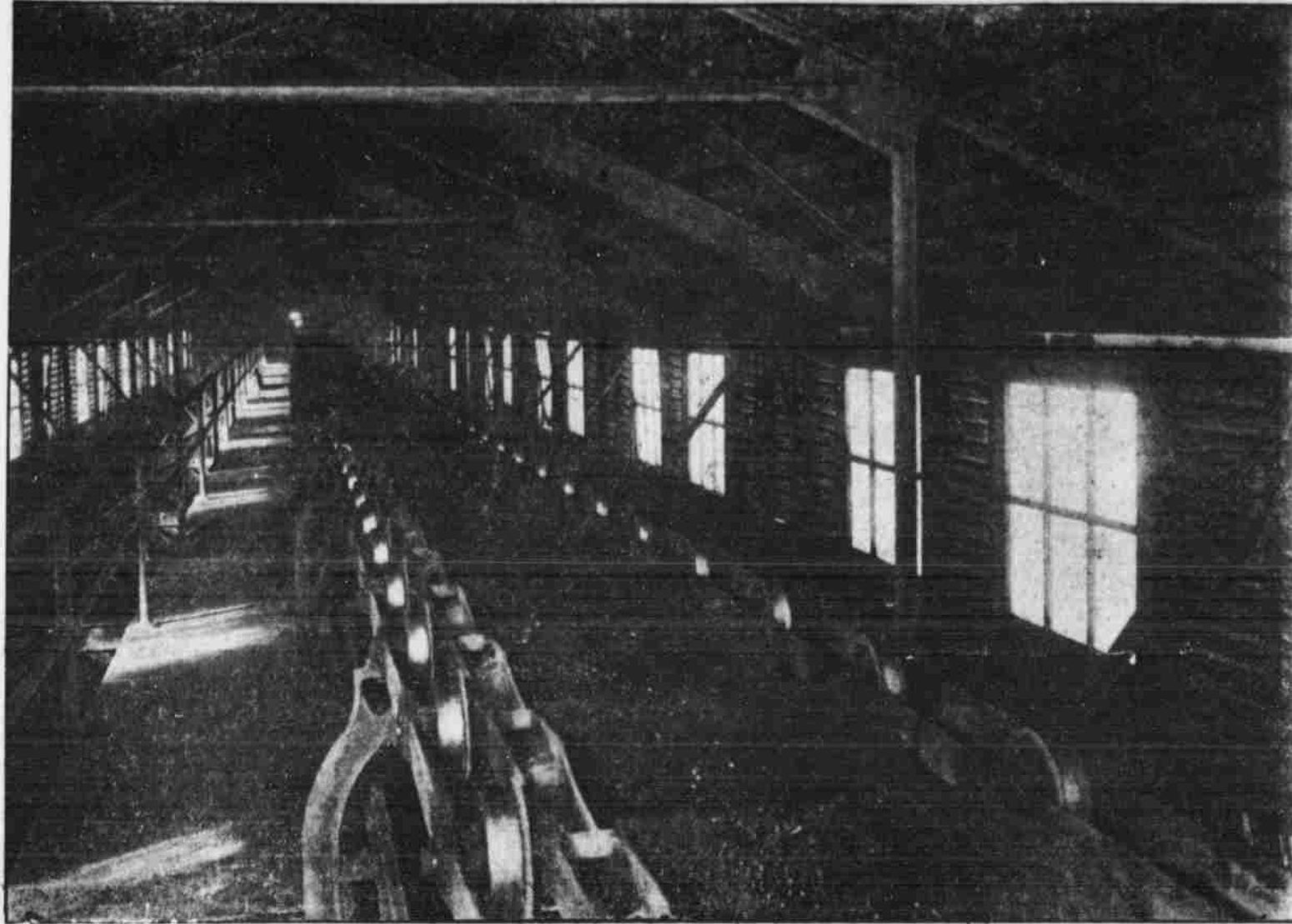
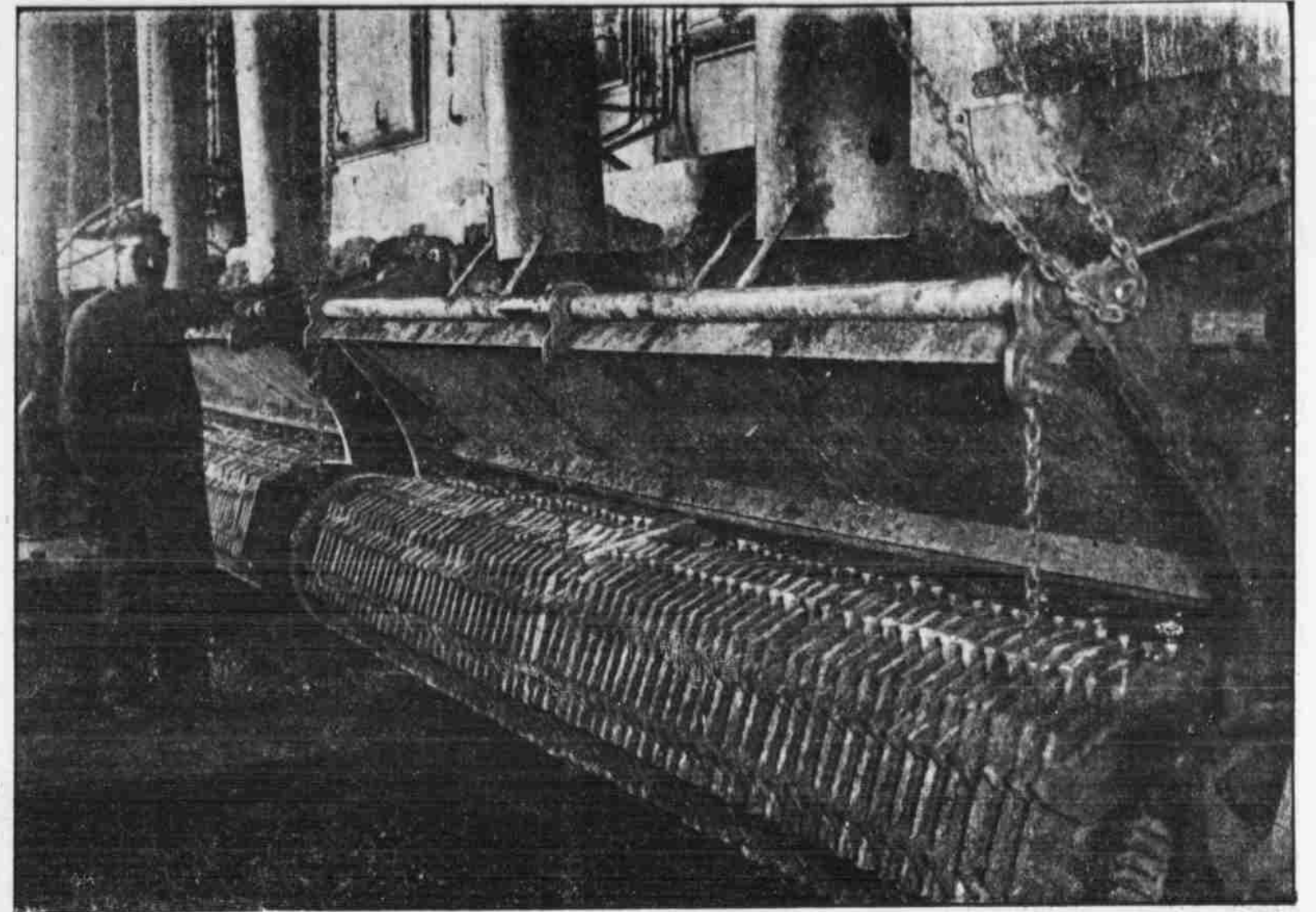


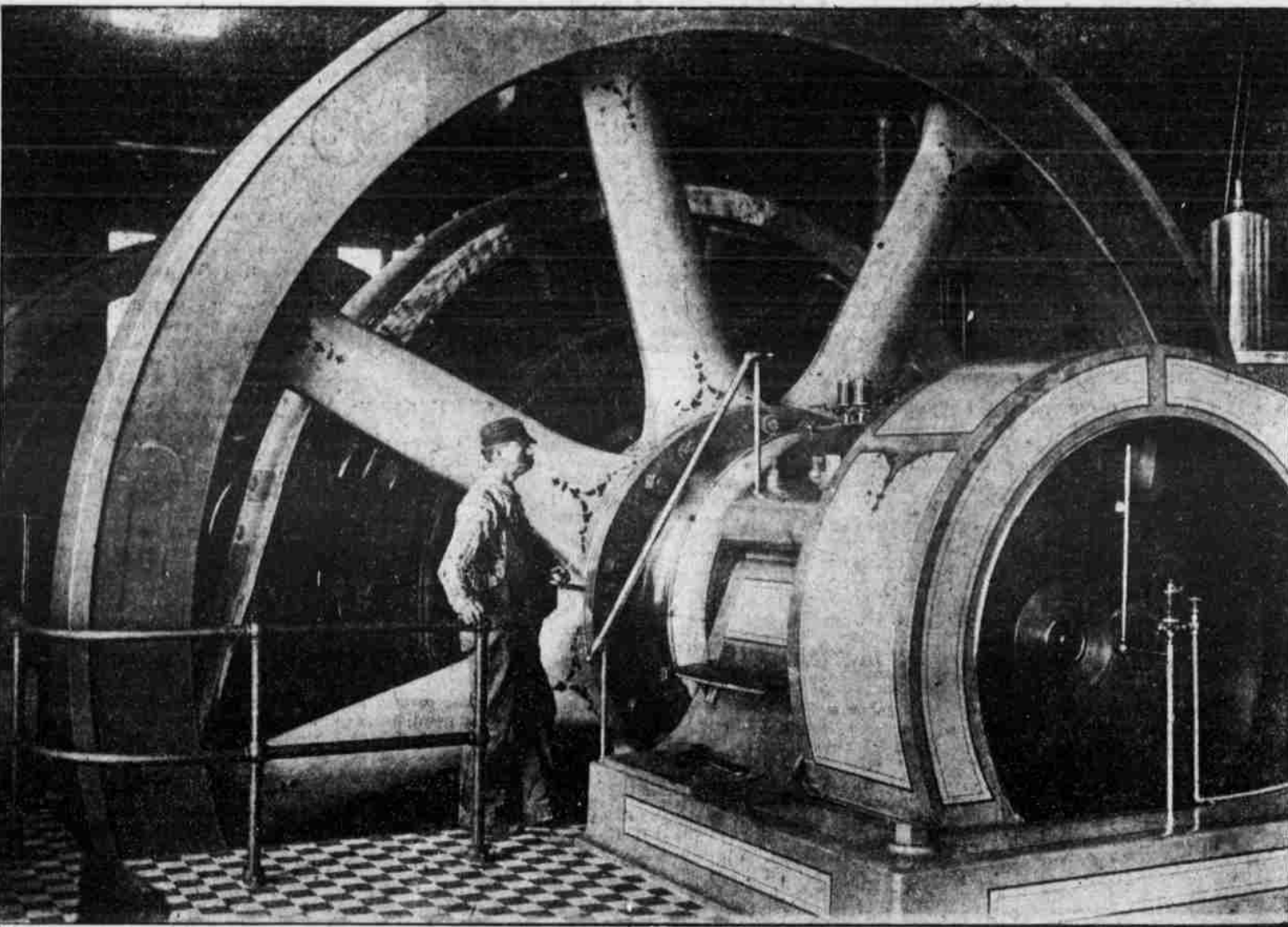
Firing a Furnace Without Firemen---Mechanical Device Shovels Coal



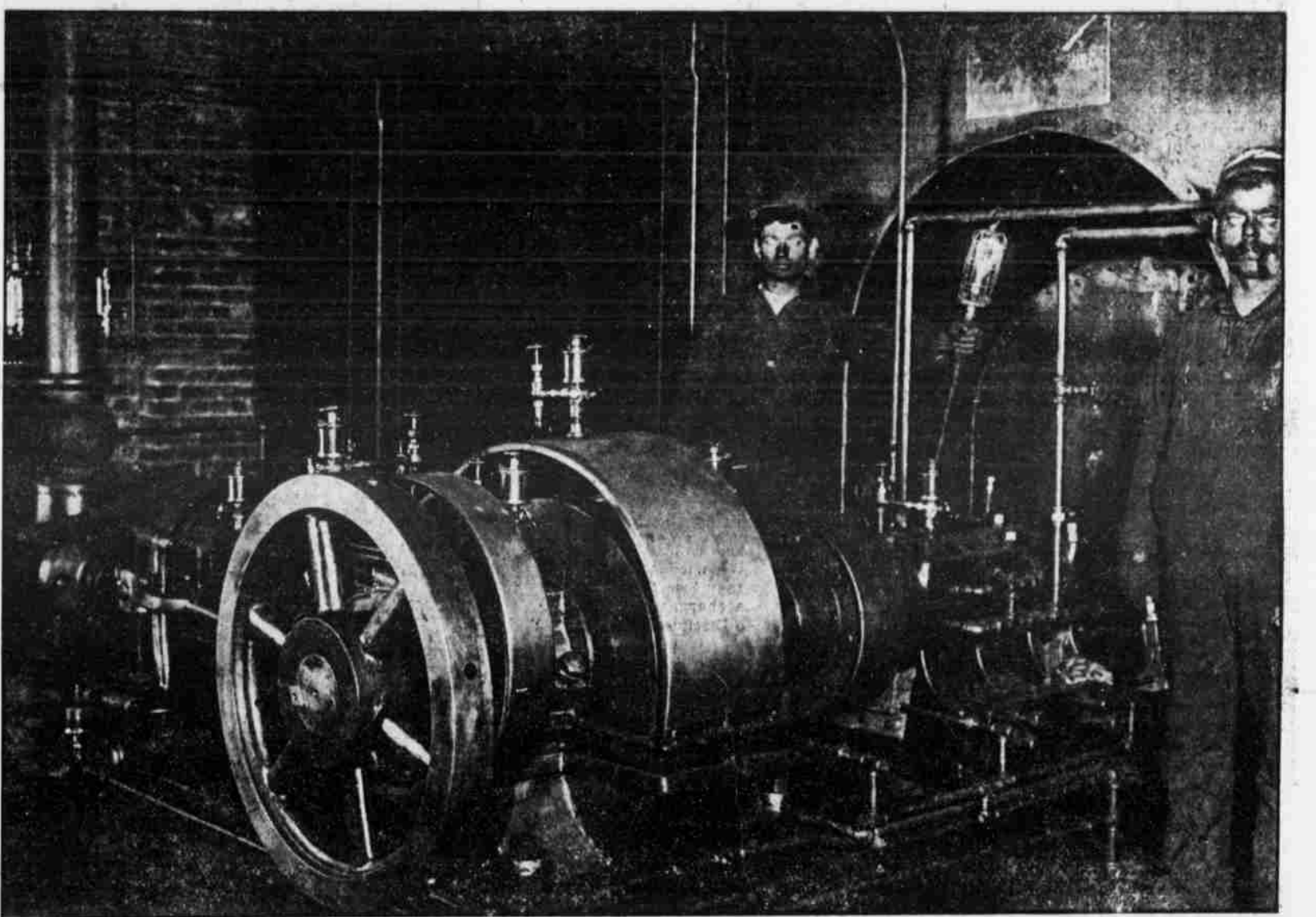
CONVEYOR THAT TAKES COAL FROM THE CARS TO FURNACES AND BRINGS BACK THE ASHES AT THE STREET RAILWAY POWER HOUSE.



VIEW OF THE REVOLVING GRATE WHICH FEEDS THE FURNACES UNDER THE GIANTIC BOILERS AT THE STREET RAILWAY POWER HOUSE.



ONE OF THE BIG GENERATORS AT THE NEW POWER HOUSE OF THE OMAHA AND COUNCIL BLUFFS STREET RAILWAY COMPANY.



ENGINE USED TO DRIVE THE BLOWER TO FORCE THE DRAFT UNDER THE BOILERS AT THE NEW POWER HOUSE.

WONDERS of modern science are often almost beyond belief. To make this statement absolutely clear to the public it is only necessary to say that just two men are required to keep up the fire under the eight great boilers in the Omaha street railway power house at the foot of Jones street. Hearing this the average householding citizen sits back and draws a mental picture of himself, the servant maid, his wife, her mother, two of the children and an occasional neighbor, all putting in good hard work continuously to maintain a very feeble blue flame in the family furnace. Then that householding citizen is apt to get out an unexpired edition of "Oh fudge" and to make some comment about "newspaper talk."

But such mechanical perfection is almost a fact. The almost comes because in reality eight men are on watch in the fire room night and day. But three or four of these are busy shoveling coal and doing odd jobs and two others are needed in ad-

ditional capacities about the great modern fire room which the traction company has but lately put in commission. Two men only are needed to tend the eight fires and see that they keep ice from forming in the boiler tubes.

What the New Stoker Does.

To the person familiar only with the old-fashioned methods of firing, this system will seem almost perfection when it is added that the daily consumption of the company is about three cars of coal. That would be something like 100 or 120 tons every twenty-four hours. Of course the consumption in the average family furnace is very great, but it is to be doubted if there are a half a dozen private houses in Omaha which use this much coal a day. The unusual cold weather has added 25 per cent to the coal consumption of the street car company. The cold does not make it harder to heat the boilers, but with the snow it makes the right-of-way very bad, so that a heavy addition to the regular power must be made

in order that the cars can mount the slippery hills.

A person who is interested enough to navigate the snowdrifts and devious railway yard paths which lead to the new power plant should begin his inspection and follow it through in about the way that a chunk of coal inspects the house. The chunk of coal has the advantage, for it gets to the power plant in a nice, red, airy car, while the investigator has to walk from Tenth street. This car of coal is first rolled under the east side of the building and stopped over a hole between the rails which looks like the upper five feet of a mine a mile deep, or like that part of the thermometer down which a person peers to see the mercury. The coal used is the ordinary white-streaked variety from Iowa and Missouri, and it gets shown immediately after arrival. The brake is applied and the coal dumped roaring down into the hopper. Under this is the crusher.

The coal is in chunks from the size which blows into your eye while you are watching up to the hundred-pound variety, and it is about as squashy as soft stone. The crusher is used to the work, and after having an oil highball or two from the hose, thinks nothing of mashing up the combustible. A nice, strong roller covered with hard protuberances called studs, gets the poor, unprotected coal off in a corner where there is no one to see fair play and with the exertion of about seven horse-power worth of trouble makes that coal look like a consignment of charcoal tablets which have been through a head-on collision.

On the Way to the Fire Box.

After the crusher gets through with it the coal has to be carried away. A shutter is not now the up-to-date appliance for such work and in place of it is a belt conveyor. This is a nice, wide strip of material kept in a sort of concave, palm-like position by rollers which allow it to pass under the crusher and onto the overlapping basket conveyor. The crusher keeps the belt loaded with pulverized coal which is dumped off at the other end into the baskets. These are very interesting affairs of themselves and run up the walls and over the ceiling and down at the other side, and do other tricks. While they are passing under the place where the belt is busy spilling coal fragments they run along one after the other, with their arms, as it were on each other's shoulders, like a bunch of chorus girls. When they have crossed the stage, that is, the floor of the boiler room, their cables turn upward into a sort of elevator shaft and each basket separates itself from all the others and goes swinging up with its load of coal like the cups in the old cistern pump. When they get to the top again the baskets take hold of hands once more and glide carefully across the top to the place where they have been requested to dump. There are eight towering coal hoppers over the eight furnaces and an ordinary sized man down below somewhere can induce the coal baskets to drop their coal into any one of the eight which he desires. After obliging the

man in this way, the baskets continue on to the south side of the building, down the wall into the basement again and go back under the coal supply for another round.

Here's the Real Thing.

After the coal has settled down in the hoppers over each of the furnaces there comes into play a principle which all of the older inhabitants will recognize. That is the useful little idea which allows a man to fill up the baseburner once or twice a day and causes the coal to melt out of an iron tube at the lower end where the blaze is busy burning. This is what happens on a larger scale at the power house. Two spouts hang down from each of the great iron hoppers away up in the roof and pour the coal slowly day and night onto the chain grates. These are the stoker part of the mechanical stoker. They are in fact bicycle chains, each eleven feet and nine inches wide. They are composed of bits of grate bar jointed together so as to move around cylinders at the front and back of the firebox. This chain, therefore, day and night moves with awful majesty--awful because loaded down with coal--under the spouts and slowly into the firebox and out the other side. The coal is, therefore, not chivied about with a long iron utensil by a perspiring and grimy individual who would rather be president of a bank. The chain grate enters the fire with the coal spread evenly upon its surface and combustion is completed by the time the cinders are within six inches of the bridge wall or back of the firebox. Then the ashes are dropped into a hopper in the basement under each furnace and the chain grate moves around under and forward to get another load of coal.

At this point of the game the basket conveyor comes in again. The hoppers hold the ashes for a day's run. Once in every twenty-four hours the coal supply is cut off from the carrier and the ash hoppers opened. Some one was thoughtful enough to build the plant that way, so the conveyors moved under the hoppers. So when it is ash time the baskets collect the cinders and after shoving them around over the place again, shove them out through the chute into some cars the railway company provides; and the cinders are taken away and put on the right-of-way as ballast. That is as far as the coal gets in its tour of the power plant.

Power for the Plant.

But there are other interesting things about the place. There is a little oscillating engine which works like the little alcohol burning locomotives that delight the youth of the country whenever they (the engines) happen to work as their maker, or rather their purchaser, intended them to work. This seven horse-power engine is really the man who runs the fireroom. The engine runs the shafts which revolve the cylinders over which the grates pass. All the intervention of man required is for the fireman occasionally to look in and see how the fire is going. If it is a little dull he can brighten things up by shortening the arm on the feeder, thus bringing the coal into the fire at a faster pace. The entire fireroom is run now with a shift of eight men days and eight nights. Before the new house was in commission at the Nicholas street house

and at Council Bluffs, thirty-five men were required on duty to keep up steam.

Induced Draft Feature.

Observing persons may have noticed that the street railway powerhouse has no magnificent and imposing smokestack, as has the smelter and the shops. The Jones street chimney is not so tall as the funnel of an ocean liner--it is like a short clay pipe. The draft, furthermore, astonishing to say, is made the same way that the smoker draws his smoke through his clay or briar. There is a thundering big fan up under the roof which sucks and sucks, so that the air rushes in through the grates and makes the fire roar. The Union Pacific, with its 500-foot chimney, cannot have a stronger draft than this fan produces. The advantages of the induced system are several. By increasing the speed a stronger draft can be made when it is desired--the grates could be melted if the power were turned on full twist. In case of lightning the tall chimney is an inconvenient lightning rod and with storms it may break down an entire plant by being capsize. The cost of maintaining the induced draft and the original cost and maintenance of the tall chimney about balance each other, so that experts disagree as to the financial advantage.

Power for the Trolley Lines.

It may not be generally known, but the Pullman palace car plant now uses the Corliss engine exhibited at the Centennial exhibition in Philadelphia. The new engines of the street railway powerhouse are the latest thing in the same make. Three of these engines and dynamos are now in commission and a fourth will be placed ready for work by April 1. Two of the splendid machines are equal to the regular work of the day, with a third added for the rush traction in the morning and the evening. The fourth is a reserve unit to be used in case of breakdowns and of overhauling. The voltage is 575 with the amperes, according to the load. The current generated would not be apt to kill a well man unless it got him in a corner where he could not get free. It would throw him away and be uncommonly rough with him. The power producers are direct connected generators and crank shaft engines of 2,000 horse-power each. The engines are from the Fulton Iron Works company and the generators from the General Electric company. They cost each something like \$20,000 and are very handsome toys.

Newest Use of Steam.

Superheated steam is the newest thing about the power house. As Chief Engineer D. W. Gilbert would express it, the object is to get a dryer steam with a greater expansion. Whatever that may mean, the steam is a hotter and more scientific article by a good deal than young Mr. Watt found in his grandmother's teakettle. The new engines, although they look very shiny and mild, are cross-compound compound condensing two cylinder affairs. The dry superheated steam tussles about in the high pressure cylinder a while and then it hurries about through some pipes and technicalities and opens up a new parallel in the low pressure cylinder. The most interesting part about the thing, however, is the way the overheated steam is calmed down and turned into water again that can be

pooured about and used over in the boilers. The engines are not satisfied with getting an expansion of sixteen times against the miserable four-flashing of the ordinary puffing, snorting steam user. These highly cultured specimens object to the work of pushing the steam out into the world after it is through with it, as do the ordinary engines. It is too exhausting. The lay mind does not at once grasp the fact that the exhaust of the ordinary high-pressure engine has to push against the weight of the atmosphere when it spurts out of its pipe, and that if the exhaust could play into a vacuum the engine would have about 147 pounds more energy for other purposes. By an arrangement in which a part of the Missouri river assists the street railway engines do away with nearly all of the back pressure of the exhaust, and pouring their steam into a vacuum professionally gauged at 28, have only one or two pounds to exhaust against. There is a big steel box in the cellar called a service condenser which keeps two centrifugal pumps busy. It is filled with

pretty brass tubes and a nice pipe from the river brings the river in and squirts it through these tubes. The pumps all this time, mind you, are keeping the condenser free from draft. The engine steam wanders in here and is condensed before it knows where it has got to. Then it is led away in pipes, and heated up again. The wear and tear naturally uses up some water, so that every time the engineer trims ship or whatever he calls it, about 10 or 15 per cent of new water has to be drawn from the city mains.

The system which is now in use was worked out and became a practicality about ten years ago. It is used in all the new power houses built. The Omaha plant is working finely and if the coal does not run out to cause another suspension of transportation, will probably be very satisfactory to all parties for some years to come. The plant was designed by Lichter and Jens of St. Louis. D. W. Gilbert, as chief engineer, has direct charge of the fine power producer and H. P. Noise is the master mechanic and electrician.

Freak Laws Proposed by Many Solons

Would laws "Uncle Tom," ALBURN N. ROE of Columbus, O., has written to Governor Cummins asking that he recommend the passage of a law making the presentation of the play "Uncle Tom's Cabin" on any stage in Iowa a felony under heavy penalty. Roe declares the play misrepresents the south.

Awful with the Robins.

Killing all the robins as foes of fruits and berries and admit Chinese coolies to overcome the scarcity of farm help measures recommended by W. H. Skillman, president of the State Horticultural society, in addressing the annual convention of the organization at Trenton, N. J. Dr. J. W. Ward, who last winter led the unsuccessful robin fight in the legislature, today deserted the cause, advising the society against reopening a crusade upon which public opinion was so overwhelmingly against.

Lace Curtains for Schools.

The 18,000 school houses in Kansas are likely to be equipped with green shades and lace curtains for the windows. The teachers of Kansas advocate this reform against.

To Flog Wife-Beaters.

A bill is being prepared for the legislature of Connecticut that if passed will revolutionize the punishment for certain offenses not at present adequately cared for by the revised statutes. At least that is the opinion of Prosecuting Attorney Hinman of Meriden, originator of the bill. Mr. Hinman's bill, upon which he is now at work, provides that a man who beats his wife cruelly, or, for that matter, any

man who strikes or beats cruelly any woman, shall be flogged in the county jail, the whipping to be done by the jailer or his assistant in the presence only of the jail physician and the clerk of the institution. There shall be no other witnesses.

Tipping a Misdemeanor.

The itching palm of all waiters and porters in the state of Missouri will have to go uncrossed if the bill introduced today in the house by Tubbs of Gasconade becomes a law.

The measure makes it a misdemeanor for any proprietor to allow any of his employees in restaurants or hotels to accept "tips" and places a penalty on any infringement of the rule.

The bill is already gathering a great following among both the members from the country and the city, but the porters around the hotel where the measure was being discussed were lobbying against its passage.

For Limited Marriage.

According to State Senator Frederick Dumont Smith of Kansas his bill, which will be introduced in the Kansas legislature, making marriage a civil contract with a ten-year time limit, was not proposed by men, as has been generally supposed, but by a delegation of women, whose names the senator refuses to divulge.

"I think that it will be found that the women will be favorably impressed with the measure," said Senator Smith today, "and that they will be glad to give it their moral support."

Senator Smith says he is not convinced that his bill is the best remedy for the growing evil of unwed marriages and the life of misery forced upon thousands of women, but he believes it is a step in the right direction. He makes his bill public to give people interested in the question an opportunity to discuss it.

Some Picturesque and Pointed Etchings

Auction at a Funeral.

TALKING about your graveyard rabbit superstitions and that sort of thing, there is no class of people who believe in it stronger than the gamblers," said an old gambler, "and I saw it exemplified in the strangest way at Pittsburg, Kan., ten years ago. 'Kid' Jackson, one of the best known gamblers in that part of Kansas, died of consumption, and all of the gamblers set out to give him a good funeral. They bought a fine casket and all the flowers the room would hold, and had a procession fixed up with plenty of mourners, because there was a certainty of refreshments below after the obsequies, even if our friend was not enjoying them above. All the pallbearers were gamblers and friends of the dead man.

"Well, we started out and reached the cemetery all right, and the grave-digging man was on hand with his pick and shovel. We set the coffin down on the barriers across the grave and were preparing to let the 'Kid's' body down into the grave. Just then a rabbit jumped out of a thicket close by and landed right at the bottom of the grave. He was killed in a second, just as who fired the shot I never could tell, but it does not matter. We all carried guns in those days and were ready to shoot at the dropping of a hat. But, anyway, the rabbit was dead.

"The graveyard rabbit, by heaven," one of the fellows said, as the rabbit was picked up. "Talk about your mascots, here is one for me," and with that he began cutting on the left hind foot. 'Hold up, there,' said another of the pallbearers, 'let's sell these feet off and make up a pot for the 'Kid's' folks, if we find he has any folks, to send it to them.' It was agreed, and in a minute the funeral services were forgotten and an auction bidding began at \$5 for the left hind foot and was promptly raised to \$10 and then to \$15 and to \$20, and finally the foot sold for more than \$30. The other hind

foot was bid for and brought \$3. The other two feet are not considered of such good omen and were not so much in demand. When the auction was over we found that the proceeds were a little more than \$100. Then we turned our attention to the body and interred it as it should have been.

"Two of the boys in the bunch who got a foot apiece were Ed O'Connor and Charlie Cropper, and I have often wondered whether their luck after that was good or bad. But I have been away from that country and I have not heard from them in years. I got one of them and I can't find out that it has brought me anything that would not have come otherwise. Perhaps I am hoodooed."--Topsie Capital.

The Villain Rebuked.

A number of professional men gathered at the Art club in Philadelphia a few days ago were exchanging reminiscences of Edwin Forrest, the great tragedian. One of them told the story of Forrest's experience in the west, which was not only of interest in itself, but also a tribute to the art of the actor.

"The play was 'Virginia,' and Forrest was at his best. In the scene where he plays his daughter the audience was almost stricken with awe, and not a sound was heard until the scene was concluded, after which the artist was greeted with overpowering applause. In the following act Virginia comes on the stage looking worn and distracted. The reaction has set in, he is frenzied over the loss of his daughter, and he walks up and down, crying out, 'Virginia, Virginia! Where is my child?' An old miser who occupied a front row in the market house had the murder scene could stand this no longer and, rising in his place, shouted out in loud tones, freighted with intense indignation. 'Why, you old villain, you killed her in the market house in the last act. You know it well enough. You are a hypocrite, as well as a villain.'--Harpers Weekly.