AN ALBINO DEER.

An albino deer, with a coat as white as the drifting snows, eyes a delicate pink, and with a tread as soft and discreet as an elk fawn, was killed in the Canyon Mountains of southern Oregon recently. It was one of the very few albino deer ever seen in the mountains of the West. Old hunters tell of seeing them, usually separate from the main herds, and at various times during the early days; but they were too shy and discreet to be approached near enough for a shot.

The deer shown in the accompanying illustration, and which was killed in the Canyon Mountains, was with four other deer at the time it was found, and had not this been true, the hunters would not have taken it for a deer. Its white coat made it far more conspicuous than the remainder of the herd, and it is perhaps for this reason only albino deer are shunned by their mates.

The albino deer bears exactly the same relation to the deer family that the albino of the African race does to human kind. Aside from its white coat and pink eyes, it is like all other deer; possibly its fur is softer and more silky.

The specimen found in the pine forests of the Canyon Mountains will be made a part of the exhibit of albino mammals at the Smithsonian Institution.

METEORITES AND THEIR COLLECTORS.

BY PROF. CHARLES F. HOLDER.

The collecting meteorites is one of the most interesting fads or professions in the country. The men who are engaged in it are, in the main, expert mineralogists, who have made it a study all their lives and are devoted to it; men who can tell the location and circumstance of every fall known to science. That the business is a profitable one is well known, and large sums are often realized by the fortunate discoverers. Nearly all the meteorites are sold to the great museums of the country, while those which are too large to move are represented by sections, sawed off only after great difficulty and labor.

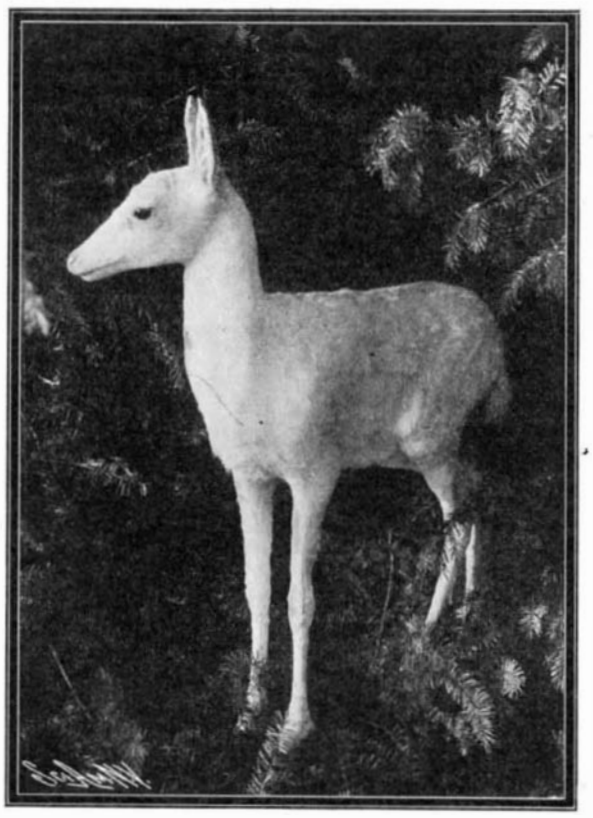
There is something fascinating about these wanderers from the sky. One may say that he has seen his specimen as a part of Biela's comet, or possibly Tempel's, millions of miles away, revolving about the sun in a sort of endless chain, and as the earth dashed through the mass of cometary matter, his specimen came plunging upon it, igniting under the enormous friction, exploding perhaps, or glancing to fall in many pieces, one of which he has secured. In the far East meteorites are still looked upon as messengers from the sky, and a volume could be written giving the theories of earnest scientists who have attempted to satisfactorily explain them and their origin.

Hardly a clear night but the observer will be repaid by a glimpse of one or more of these splendid wanderers from the unknown. Few of these meteorites reach the earth; the larger portion ignite upon entering the atmosphere, and fall as dust, which may be secured on high mountains, or in localities away from the dust of the earth. Large specimens which fail to burn, reach the earth and become buried in the soil, lying until accidentally found.

Several large meteorites have been seen to strike in Southern California during the last few years, but careful search has failed to locate them. One rancher, who lived thirty miles from the ocean, was positive that a meteor struck on his ranch "just beyond his house," but others saw it pass over the ocean fifty miles beyond. A famous meteorite was traced from Idaho far out on the Atlantic, its roar and the loud rumbling which accompanied it alarming all the inhabitants along the route.

To one who has not attempted to follow a meteorite, it might seem an easy matter to trace it. The papers generally announce the fall, and after weeks of pursuit the hunter determines the locality according to the report of the last man who witnessed the fall. He invariably states that it is on his own farm, and doubtless believes it, when in reality the spot is ten or more miles distant.

Many of the notable falls of history ave been discovered accidentally, as pse in Arizona near the Cañon Diablo the great Mexican stone found by a Mexican er in the first instance. One of the latest finds is n in the accompanying photograph by Mr. R. of Oregon City, to whom I am indebted for the garding it. The meteorite has undoubtedly g in the earth a long time, and was found t in Clackamas County, Oregon, near Oregon City, by Mr. William Dale. He observed it projecting from a mass of gravel when clearing the land of trees, and after great difficulty had it taken to his farm, about a mile distant. The stone, a huge hat-shaped object, was found in the deep forest, and was excavated only after a vast amount of labor, as its estimated weight is between ten and fifteen thousand



AN ALBINO DEER.

pounds. It was jacked up inch by inch, and finally placed upon a rude cart, as shown, and hauled with blocks and tackle down to the farm, where it has been visited by thousands.

According to Mr. Prier, it has been examined by Prof. Paul Baumel, of Portland, Oregon, an expert, who pronounces it the largest meteorite ever found in this section of the country; but as to when it fell, there is no data.

During the month of November a large meteorite flashed across the San Gabriel Valley, leaving an enormous train, and it is supposed to have dropped into the range known as the Santa Monica Mountains in Los Angeles County; but no one has been able to locate it. The writer observed a meteorite enter our atmosphere, perhaps one hundred miles up, almost directly over the city of Pasadena, Cal. It at first fell almost directly down with an enormous and brilliant train, then broke or exploded; and seemed to glance and disappeared in the west almost parallel to the earth, still with a flaming train, doubtless

A HUGE METEORITE RECENTLY FOUND IN OREGON.

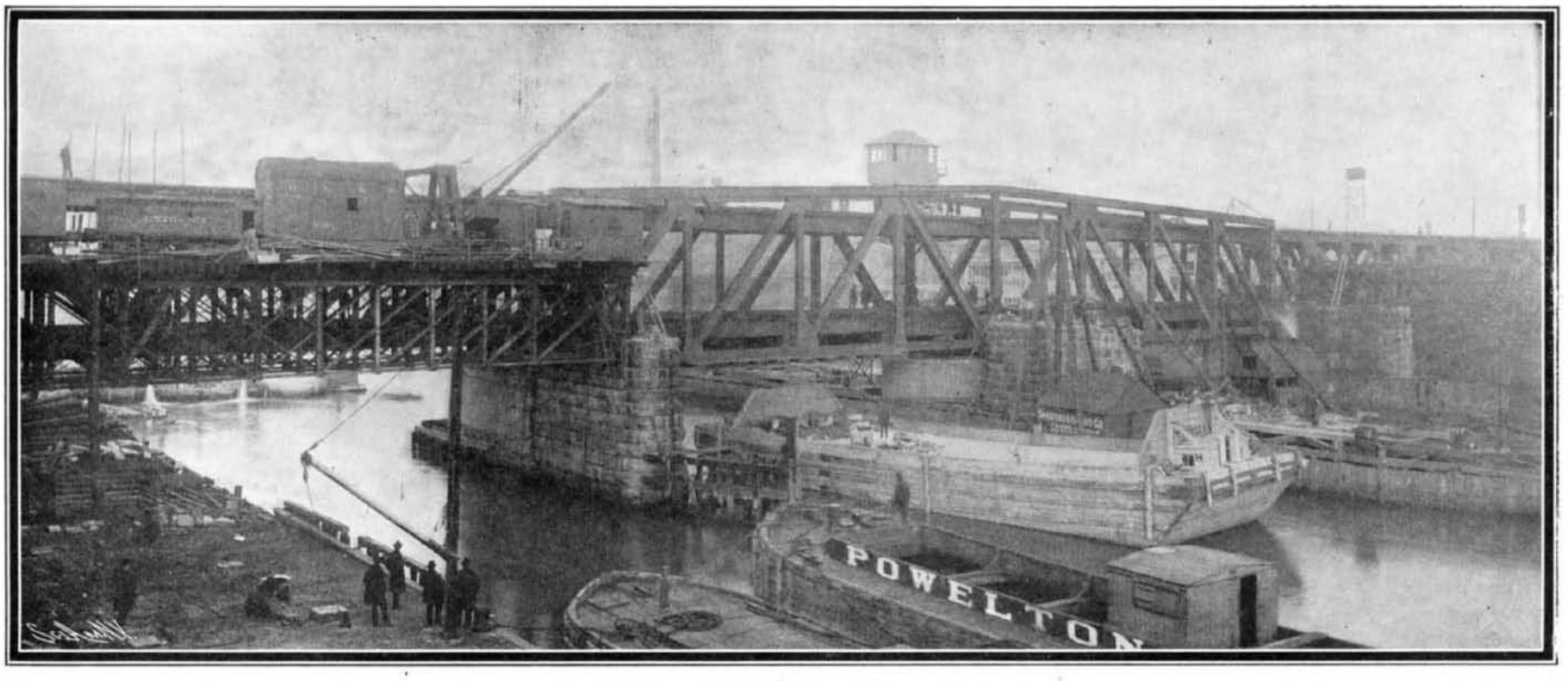
disappearing in the Pacific thirty miles distant. When this meteorite broke, it created so brilliant a light that one could have told the time by it. The piece possibly flew at first in the form of a horseshoe, as a large fiery V remained plainly visible for at least ten minutes.

The theory that the heat of the sun is kept up by meteorites falling into the sun mass, was held for many years; and anyone who witnessed the recent sunspots can realize how this theory might appeal to some. In early October, 1903, the writer was on the Gulf of Mexico between New Orleans and Tortugas, and the sun dropped into a deep-red cloud at the horizon, and at once became plainly visible. It was blood-red and covered with latitudinal bands of varying tints. What was supposed to be a cloud was first noticed on the left-hand lower face, but it was disappearing or dropping with it. It resembled a great vivid black hole broken into the sun by some object that had fallen into it, or been swallowed up, being probably distorted, appearing to be an eighth the size of the sun, a distinct and formidable object. Sunspots suggested themselves to the writer's mind, though never having heard of a spot so large as this, so black and pronounced, and it was considered a singular cloud after all, yet it sank out of sight with the sun. When the papers were received from the pilot at the mouth of the Mississippi, they chronicled the wonderful sunspots that were being seen, and the writer realized that an exceptional opportunity had offered to witness this phenomenon under most favorable circumstances, with the spot enlarged in all probability by the cloud mass into which the sun sank.

RECONSTRUCTION OF THE LACKAWANNA TRACKS THROUGH NEWARK.

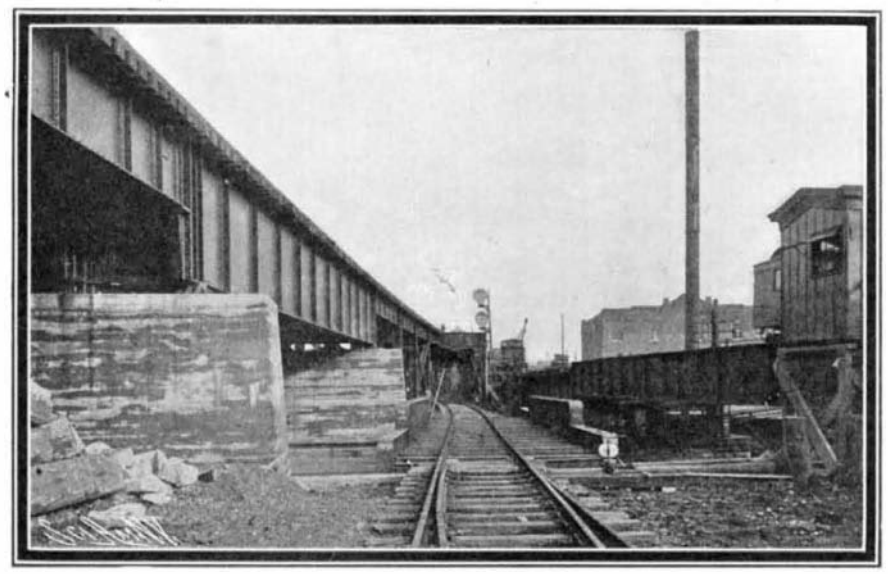
By the successful transfer, on Sunday, December 20, of a massive double-deck drawbridge from its old to its new pivot pier, the engineers of the Lackawanna Railroad brought to a successful completion one of the most important links in the change of grade and general reconstruction of the line which is being carried out from Harrison through Newark to East Orange, a distance of three miles. Hitherto these tracks have remained in the same location on which the line was originally laid down. The tracks ran through the city at street grade, and after crossing the Passaic the road climbed the hill to the west of the river on the heavy grade of 138 feet per mile, or considerably over two per cent. The growing density of the street traffic of Newark, with the attendant danger to vehicles and pedestrians of the many grade crossings, to say nothing of the great cost and inconvenience of operation entailed by the heavy grade referred to, were some of the causes which led the railroad company to decide upon the present improvements, which, by the way, will have cost three and a half million dollars by the time they are completed. These improvements include the elevation or depression of the tracks so as to give unobstructed traffic through city streets; the reduction of the maximum grade from 138 feet to 60 feet per mile; the provision of an additional third track for passenger traffic; and the construction of a new passenger station and a new local freight yard, containing a freight shed nearly 500 feet in length.

Of the whole three miles covered by the new work, one-half—or to be exact 1.6 miles—extending from Harrison to High Street, Newark, consists of the elevation of the tracks above street grade. At High Street the road strikes the hillside and here the tracks are depressed and carried below street grade, the work extending for a distance of 1.4 miles. The Montclair branch of the road is also depressed for a distance of 6-10 of a mile. The new tracks commence to rise at Harrison on a maximum grade of 1 per cent to an average elevation above street grade through Harrison of 15 feet, and through Newark of 22 feet. The average depression of the tracks beyond High Street, Newark, is 22 feet below street grade. From Harrison to Broad Street, Newark, the line contains two passenger tracks, and from Broad Street to East Orange, just over the city line, there has been added during the reconstruction a third passenger track. Adjoining the passenger tracks there is a freight track, which follows the same grade as the passenger tracks as far as Harrison Avenue and then falls on a one per cent grade to the level of the lower deck of the draw span across the Passaic River. The old location of this bridge was 35 feet to the north of its present position and 10.5 feet below its present grade. The new double-deck drawspan was built several years ago, and although only the lower deck had been used during the intervening time, it was constructed with an upper deck, to be put in service when work of reconstruction should have reached its present stage. Under the old arrangement, the passenger trains utilized the lower deck. By lowering the bridge 10½ feet at the same time that it was shifted to its new pier, the upper deck was brought to exactly the same grade as the new elevated passenger tracks and at the same time the lower deck was brought into

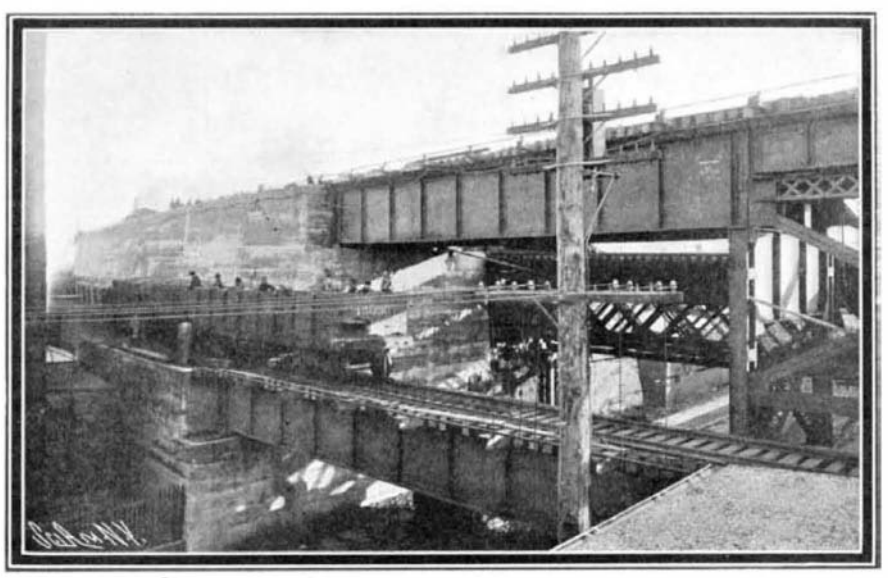


Old approaches and old draw pier in foreground.

Double-Decked Draw-Span, Moved from Old to New Pier on Sunday, December 20.



Looking East Along Freight Track Showing Passenger Structure at Higher Elevation on Left.



Street Crossing in Harrison, Showing Freight and Passenger Tracks at Separate Levels.

Stretch of Arched Concrete Construction at Freight Yard.

General View of New Passenger Station Showing Old Tracks in Foreground and the New Tracks Elevated.

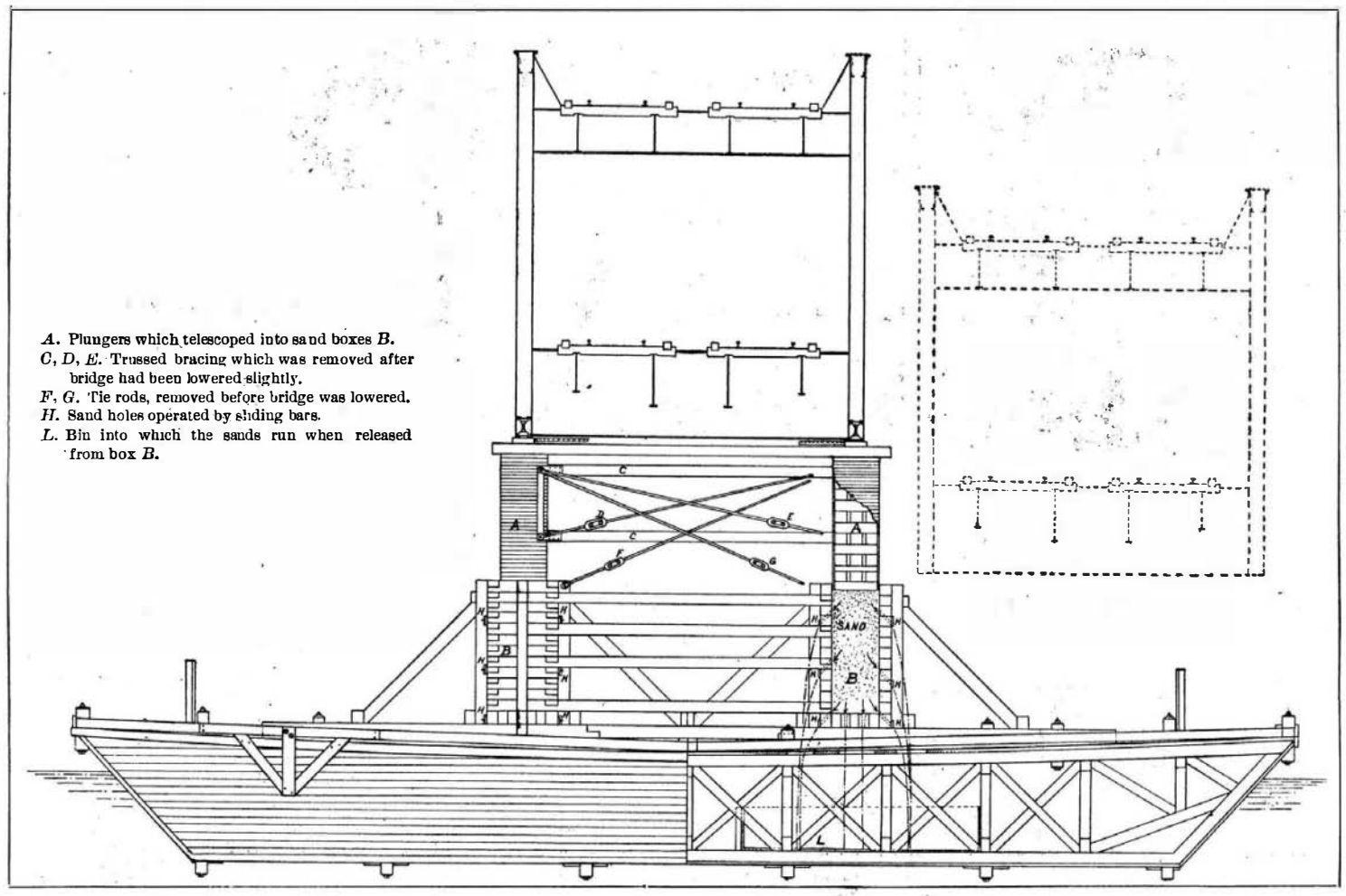
RECONSTRUCTION OF THE LACKAWANNA RAILROAD TRACKS THROUGH NEWARK.

similar relation to the new freight track. As traffic is now being carried on, the passenger trains cross the Passaic River at the higher level, while the freight trains, which, as we have seen, run parallel to the passenger tracks from Harrison to the river, now swing in underneath the passenger tracks, cross the Passaic on the lower deck, and run at street grade into the terminal freight yard.

The roadbed from Harrison to the Passaic River consists of embankment, with plate girder spans across the street, resting on concrete abutments. The fill terminates on the eastern side of Passaic Avenue, and here some interesting steel truss work is necessitated in swinging the freight track in underneath the passenger tracks for the crossing of the river, the distance of about 300 feet between the end of the fill and the easterly rest pier of the draw span being spanned by several double-deck steel trusses of special design and construction. The draw span has a total length of 221 feet, a breadth from center to center of trusses of 29 feet 3 inches, and a depth from center to center of chords of 21 feet 3 inches. Its total weight is 985 tons. After crossing the bridge the tracks are carried on a steel truss followed by a series of plate-steel girders and lattice posts, resting on a heavy concrete retaining wall. This construction extends to Ogden Street, which is crossed by a plate girder which is followed by a steel viaduct that extends to Spring Street. Here commences a long stretch of concrete arches measuring over 500 feet in length, adjoining which, with its north wall resting upon the southerly edge of the viaduct, is the new freight house.

The concrete arch viaduct terminates at Broad Street, which is crossed by a 106-foot plate girder span, and a smaller span carries the track across Plane Street. Just beyond Plane Street is the new passenger station—a handsome new building of stone and brick, whose architectural features show to good advantage in the accompanying photograph. It is a three-storied structure, containing ground floor, mezzanine, and upper floor. Entrance is on the ground floor, the ticket offices are on the mezzanine, and the third floor, which is on the level of the tracks, contains the waiting rooms and platforms. Beyond Plane Street there reaches for 685 feet a stretch of roadway, consisting of a fill supported by massive concrete retaining walls with their outer faces approximately vertical. The average height of the retaining walls is about 25 feet above the ground level. The easterly end of the retaining wall fill terminates at the slope of the hill, and here the tracks enter an open cut with concrete retaining walls, the average depth of the depression being 20 feet and the average grade 1.14 per cent.

Of the whole work as thus described, the elevated section is practically completed, while the depressed portion is well under way. The cost of the work, as we have stated, is about $3,500,000. The reconstruction of the line, however, is not concerned with the city of Newark. An important elevation and depression of the tracks is being carried on simultaneously at Summit, where twenty grade crossings will be eliminated. Furthermore, the work at Newark and Summit does not cover the whole scheme of improvements, since it is the intention of the Lackawanna company to eliminate all grade crossings between Harrison and Morristown, a distance of 30 miles; and as this scheme involves the change of grade either to elevated structure or subway through eight different towns, the magnitude of the work will be readily appreciated.



SCOW AND SAND JACKS, DESIGNED FOR TRANSFER OF DRAWSPAN AND LOWERING ON NEW PIER

Transfer of the Draw Span.—We have already pointed out that the transfer of the draw span involved moving the structure 35 feet laterally to the new pier and lowering it through a distance of 10½ feet. This was accomplished by transferring the span to four pontoons; warping the pontoons 35 feet upstream and lowering the draw span until it rested upon its bearings on the new pier. Regarded as an engineering feat, there is nothing new in such a transfer; but owing to the uncertain tidal conditions, the great depth through which the bridge had to be lowered, and the necessity for very precise centering of the span, new conditions existed which called for particular care and exactitude. The chief problem, of course, was to provide a means of lowering the draw span accurately and safely through so great a distance, and the chief engineer, Mr. Lincoln Bush, who is responsible for the work, decided that it would be difficult and risky to make use of hydraulic jacks for a vertical drop of this extent. In the first place there was the possibility of an unequal action of the jacks, and there was the disadvantage that with hydraulic jacks it would be impossible to make the fine lateral adjustments that would be necessary in placing the draw exactly to center. The whole of the weight of the draw rests upon a center bearing which is placed concentrically within a circular rack. The pinion by which the draw is rotated being attached rigidly to the structure of the draw, it will be understood that if the pinion was to mesh accurately with the rack, the draw had to be located with great precision in the center of the rack. Now, in order to cover the two points desired, namely, easy control in lowering and a certain degree of lateral adjustment in the final placing on the pier, Mr. Bush designed and used an entirely new apparatus which he defines as a sand jack. The construction and operation of this was as follows: Transversely beneath each half of the draw were a pair of scows, each 31½ feet wide, by 108 feet long, and 9 feet 6 inches deep. Transversely across the scows was built up a pair of oblong sand boxes, one beneath each truss of the bridge. These boxes, which were constructed of 12 x 12 timbers, measured 4 feet 1 inch in the clear in breadth, 54 feet in length, and 11 feet in depth. The boxes were filled with perfectly dry sand to within a few inches of the top. Resting upon the surface of the sand in each box was a plunger built up of 12 x 12 timbers, whose external dimensions were such as to allow it to descend into the sand box as the sand ran out, with a clearance all round of half an inch. These plungers were 11 feet high, and at the commencement of the operations, their bottom face rested upon the sand just 7 inches below the top edge of the boxes. The latter were provided with four horizontal lines of sand holes in the sides, each hole being 2 inches in diameter. The flow of the sand out of the holes was regulated by means of wooden slides on the outside of the boxes with holes in them to correspond with those in the box. There were also two lines of 2-inch holes bored in the bottom of the boxes. To prevent racking or swaying of the structure, the two plungers were braced together by means of timber struts and iron tie-rods. In carrying out the transfer of the span, the pontoons, partially submerged with water ballast, were floated beneath the bridge, the centrifugal pumps were started, discharging the water ballast, and the span was lifted from its bearings. It was then warped upstream and centered over the new pier; and then, by opening the sand holes and allowing the sand to flow out, the span was brought down speedily and with great accuracy until it rested upon its new bearings, the work being carried through without any hitch, and this in spite of the fact that a heavy rain storm came on and lasted throughout the whole of the operation. If the water had entered the boxes of course it would have packed the sand and prevented its flow through the sand holes; but provision for this contingency had been made by covering the sand boxes with tarpaulins. A certain amount of water, however, did get into one box, but its presence was quickly detected, and the temporary packing of the sand was easily remedied by the proper manipulation of the sand holes. The announcement that the draw span was to

Copyright 1903, by Helen Lukens Jones.

A LONG-HAIRED HORSE.

See next page.

be lowered by these very original methods attracted widespread attention in the engineering world; and it is gratifying to the railroad company, and particularly to the chief engineer, to know that in spite of predictions of trouble, the work was carried through with accuracy and dispatch.

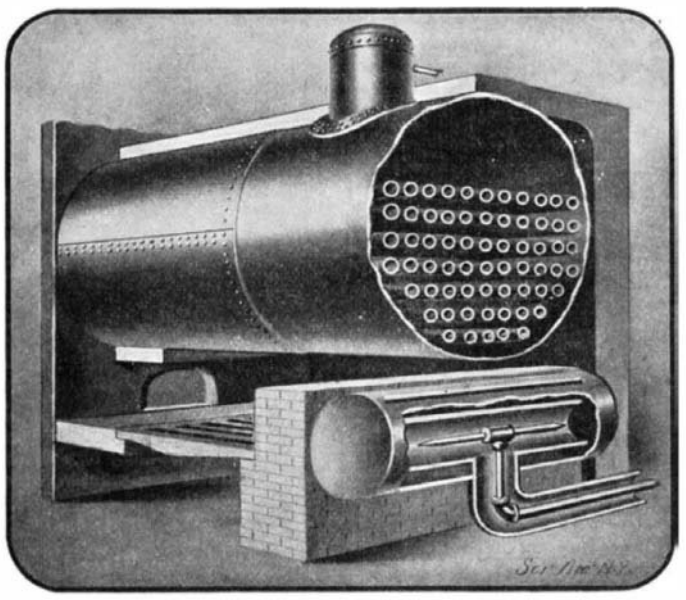
SMOKE CONSUMER.

An improved smoke consumer has recently been invented, which is especially adapted to be applied to boiler furnaces. The device is arranged to supply air and steam to the escaping products of combustion, so that the carbon in the smoke will be consumed, and a more perfect combustion of the gases will be effected. The smoke consumer is situated at the rear of the usual bridge wall of the furnace, where it is partially protected from the heat of the furnace fire. The current of air and steam is discharged from the device in the direction of the current of smoke and gases, so as to obtain an intimate commingling of the two currents, and also cause increased draft through the grate. The smoke consumer consists of a cylinder or shell provided at the top and slightly to the rear with a slot for the discharge of the air and steam. Concentrically arranged within this cylinder is a tube in which the air and steam are combined preparatory to passing into the outer cylinder. The combining tube incloses a steam injector pipe which is furnished at each end with a nozzle. These nozzles are arranged to discharge jets of steam through each end of the combining tube. A pipe entering the lower part of the furnace wall passes up through the center of the combining tube, and supplies it with fresh air. The steam supply pipe enters the smoke consumer through the air supply pipe, and conducts steam from the steam drum of the boiler. The air and steam are thoroughly commingled in the combining tube, and uniformly distributed into the end portions of the outer cylinder, where this commingled current is heated before being discharged into the escaping products of combustion.

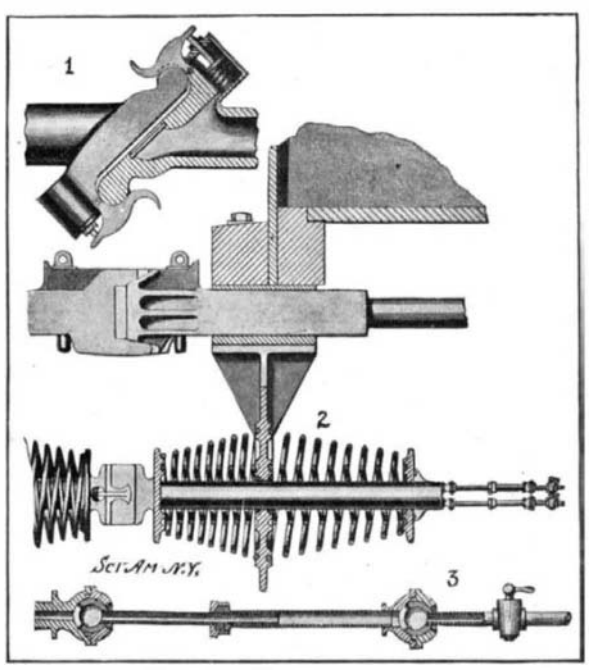
This same device may be advantageously used on steamships for ventilating the holds by drawing out the foul or impure atmosphere. A patent for this device has been granted to Annie K. Wilkins, of 520 Sheridan Avenue, Pittsburg, Pa., as administratrix of the inventor, Henry Wilkins, deceased.

METALLIC PIPE COUPLING.

The ordinary flexible hose connection for line pipes of a train often burst under the pressure of air or steam, and to obviate such dangers Mr. Harry B. Schrader, of Alliance, Neb., has invented a flexible metallic coupling of simple and inexpensive construction. The coupling embodies means for utilizing the air or steam pressure to cause a tight connection between the coupling members. As shown in Fig. 1 of our illustration, the coupling comprises two heads arranged on a transverse incline with each other. Each head is attached to a stem or drawbar having two ports opening through the head, one port being for the passage of the air through the brakes and the other for signaling purposes. Pivotally connected to each coupling head is a locking latch designed to engage with the other coupling head, as clearly shown in our illustration. The latch is provided with a curved or cam-shaped end, designed to be engaged by the approaching coupling head, thus swinging the latch to open position and permitting the heads to come together. The latch is normally held in closed position by connection with a piston, which is acted upon by a coiled spring. The cylinder in which this piston operates is connected by a small port with the main port of the coupling, so that when air pressure is admitted to the coupling, a portion will enter the cylinder, forcing the piston outward and causing the latch to tightly clamp the coupling together. The drawhead of the coupling passes through an abutment ring depending from the car. Between this and a collar on the stem are two coil springs, and similarly two springs are coiled between the abutment ring and the collar on the opposite end of the stem. A telescoping pipe section connects each port with its respective train pipe. The sections have ball-and-socket connections with the stem of the coupling, which permit perfect freedom of motion to the drawbar.



SMOKE CONSUMER FOR BOILER FURNACES.



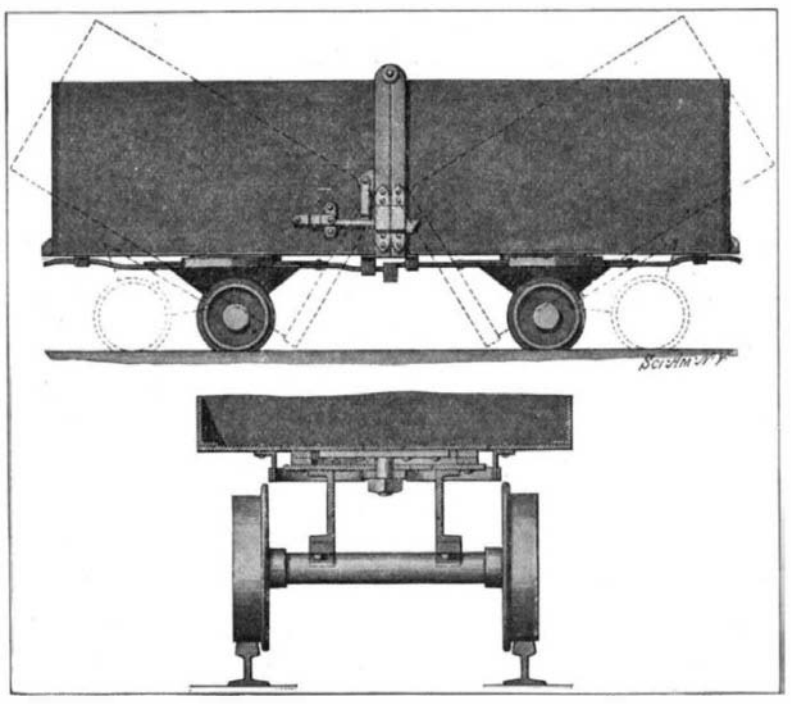
METALLIC LINE-PIPE COUPLING.

A LONG-MANED HORSE.

A marvelously-maned mare, whose wealth of silver-gray hair reaches a length of eighteen feet, and surpasses anything of the kind ever heard of in equine history, is owned by George O. Zillgitt, of Inglewood, Cal., who purchased her seven years ago, when she was three years old. At that time her mane was of ordinary length, and it was not until a year later that it began to grow with unusual rapidity. For a number of years this horse was used on the Zillgitt farm in North Dakota. During that time the mane was kept in a net, and was seldom taken down oftener than once a year. The heavy plow collar rubbed against and injured the back part of the mane, but the upper part still remains, and trails out in gorgeous waves of silver when unbound from the braids that are so necessary to keep it from getting tangled. No one has been able to account for this superfluity of hair. The animal has not been given special care. She has been treated quite like an ordinary horse, and the extraordinary growth is simply the result of some strange prank of nature. A month ago Mr. Zillgitt took the horse to California, where she is being used in the family carriage. She is the mother of a colt that seems destined to be even more famous than her parent. Though only a few months old, this colt possesses both mane and tail that reach to the ground.

IMPROVED DUMPING CAR.

A patent has recently been issued on an improved dumping car of the type used in mines for transporting ore from one point to another. The improvements relate especially to the running gear, which is so designed as to facilitate turning curves, and also to the operating devices whereby the car may be readily dumped. As indicated in our illustration the car is made in two sections, each supported by a single truck. These sections are hinged together at the top and are normally maintained in alinement and in horizontal position by a latch at each side. The trucks, which are pivoted to their respective sections, are connected by draw-bars. The connection is such as to permit a limited swiveling movement of the trucks. Normally, however, the trucks are held in alinement by flat springs bearing against the drawbars at each side. When it is desired to dump the cars the bolts or latches at the sides are released and the car section tipped downward to the dotted position shown. As the car sections are hinged at the top they must move apart when tipped, thus permitting the load to be freely discharged. The car sections are not centrally mounted upon the trucks, but their outer portions overbalance the inner portions, so that after their load has been discharged they will swing up to horizontal position, which position they will normally retain even without the aid of bolts or locks. The inventor of this dumping car is Mr. Edward I. Morey, care of G. E. Collins, 217 Boston Building, Denver, Col.



IMPROVED DUMPING CAR.

The Jungner-Edison Accumulator.

M. U. Schoop, in a recent number of the Elektrotechnische Zeitschrift, records the results of a comparative study of the familiar lead accumulator and Edison's alkali accumulator. The Swedish chemist, Dr. Jungner, simultaneously with Edison, patented a galvanic combination, based on the fact that nickel oxide fixed in a suitable way on a support constitutes an available depolarizer. Whereas for purposes of transportation, the present lead accumulator presents many drawbacks, the first of which is its heavy weight, stationary lead accumulators, in connection with which both the weight and the space play but a secondary rôle, have arrived at so high a degree of perfection that no other type of storage battery is required for stationary use.

The parallel between the lead and alkali accumulators, though not complete, goes to show that nickel sheets or steel sheets plated with nickel in alkali solution, when exposed to the effect of currents, will not be altered in the least even after weeks, corrosive effects being, as is not the case with the lead peroxide plate, never observed. The author, however, thinks it possible that the active masses present in perforated pockets in the form of compressed powders devoid, it appears, of the adhesive properties of lead salts, would drop from their supports in course of time. The author thinks a diminution in capacity would be avoided by heating the electrodes. The alkali cell would finally be inserted into an automatic charging and discharging device, allowing 200 to 300 discharges and charges being made during one month. As regards the life of lead accumulators, even in the best of accumulators the positive lead support is gradually destroyed by oxidation, the negative mass diminishing progressively in capacity; the need of durability is therefore absolutely in disaccord with the demand for a small weight. On the other hand, it is inferred from the tables recording the experiments of the author that the alkali storage battery, besides some evident advantages, presents serious drawbacks. The author, however, thinks this type of accumulator to be capable of further development.

A. G.

Building Locomotives in Germany from American Models.

The Bavarian government has decided to construct a large number of new locomotives upon the models of the American locomotives introduced by the railways of Bavaria nearly four years ago. During the next two years forty locomotives of Class B, eighteen of Class C, and twelve of Class D are to be replaced by seventy new locomotives, and 5,000,000 marks ($1,190,000) are to be expended for this purpose. The two locomotive factories in Munich, the large establishment of Maffei, as well as that of Kraus, are to be favored in the distribution of these contracts.

American locomotive builders should not lose this opportunity to secure renewed orders in Germany, since their locomotives have become the type for those about to be introduced and have proven, after due trial, the most approved models.