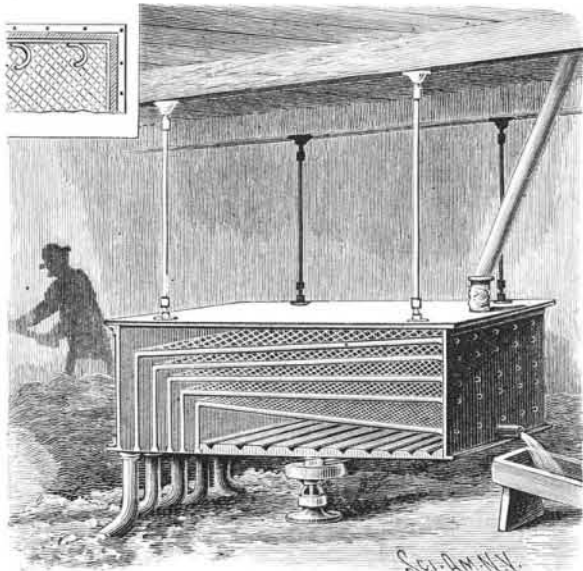


A GRADER AND AMALGAMATOR FOR SEPARATING PRECIOUS METALS.

This machine operates mechanically to separate the gold from the tailings. It consists of a gyrating box connected with a stock supply, and containing graduated sieves, the upper sieves inclined downwardly and the lower sieves inclined upwardly to their outlets. The improvement has been patented by Mr. John A. Armbruster, of No. 66 North Canal Street, Chicago, Ill. The top plate of the box is connected by suspending rods having at their upper ends ball and socket joints, with a ceiling or other suitable support, and at the bottom of the box is a suitable mechanism for imparting to it a gyrating motion. On one end of the box is a flexible inlet connected with a shoe leading from the stamp mill, and by means of which the stock, with a considerable quantity of water, is supplied to the box. Arranged in the box are graduated sieves, the larger and coarser of which, at the top, are inclined downwardly, while the lower and finer sieves are inclined upwardly toward individual discharge outlets connected at their lower ends with



ARMBRUSTER'S GRADER AND AMALGAMATOR.

flexible outlet chutes, discharging tailings on the ground or floor. Below the lowest sieve is a receiving chamber, with an outlet for carrying off surplus water, and in its bottom are recesses, or grooves, containing mercury, to readily take up the gold passing down into this chamber. On the sides of each of the screens are arranged hook-like projections, as shown in the small figure, which serve to throw the material toward the middle of the screen as long as the machine is in motion. The larger tailings, as the stock is discharged into the box with water, have a tendency to roll down the inclined upper sieves toward their respective discharge outlets, the material, as it passes through the successive sieves, remaining longer on the lower and finer sieves, to completely separate the tailings from the valuable stock. The valuable stock which passes through the fine meshes of the lower sieve is readily taken up by the mercury in the pockets, the amalgamated material being from time to time removed for further treatment.

A MEDIEVAL IRONCLAD.

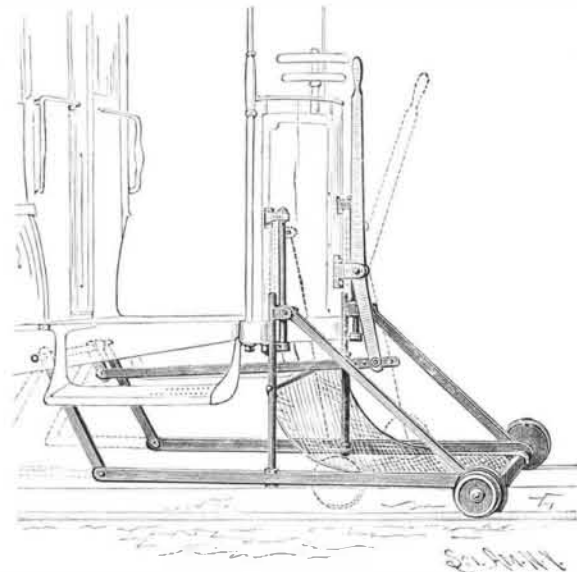
When writing on "A Man of War of 1893," in *The Graphic* of February 10, Commander C. N. Robinson,

R. N., mentioned the fact that an armored vessel was constructed in the sixteenth century, thus proving that the idea of protected ships is by no means an absolutely new one. This early ironclad was built in the year 1585 by a shipwright of Antwerp during the wars with the Spaniards. The greater part of the Netherlands had come into the possession of the house of Hapsburg by the marriage of Maximilian of Austria to Mary, daughter of Duke Charles the Bold, in 1477, but under Charles V. the sovereignty was extended until it embraced all the seventeen Belgian and Batavian provinces. When the Lowlands passed to the Spanish crown the principles of the Reformation had spread among the Lowlands, and on the establishment of the Inquisition there in the middle of the sixteenth century disturbances broke out in the provinces, and great cruelties were committed by the Spaniards. Antwerp, which in those days was a margraviate, suffered greatly. It was pillaged by the Spanish soldiery in 1574, and was again besieged in the regency of Alexander of Parma, being taken in 1585. In the summer of that year it was closely invested by land and water, and the people of Antwerp made many gallant efforts to break through the line of the besiegers, especially on the river. For this purpose they built a craft of unusual size, with a flat bottom, and armed its sides with iron plates fastened into great beams of wood. The idea was to make not so much a ship as a floating castle, impregnable to the artillery and missiles of those days, which should crush all opposition. It contained a great number of men, some of whom were placed like sharpshooters in the tops of the masts, and the rest protected by the bulwarks. The men of Antwerp were so confident of the success of their new invention that they called it *Finis Belli*, feeling sure that by its means they would be able to raise the siege and put an end to the war. Unfortunately for the brave burghers of Antwerp, this early ironclad proved a disastrous failure. It was launched upon the Scheldt, and taken across the flooded country by means of a canal cut from the river; but it proved very unhandy, and after a short career got stuck upon a bank. This untimely end of the great vessel from which so much was hoped was a source of much delight and derision to the Spaniards, who nicknamed the monster *Caranjamula*, which signifies bogey, while the men of Antwerp altered its name from *Finis Belli* to *Perdita Ex-pensa*, or "Money thrown away." The crew then deserted the ship, and the Spaniards, after a naval battle, which took place in the flooded country, and resulted in the defeat of the Netherlander, took possession of the naval monster, as they called it, though they feared that, like the Trojan horse, it had been left in their hands from some evil purpose. However, finding that it was really deserted, they seized it, lightened it, and then towed it off and got it back into the river Scheldt. It was then taken in triumph to the camp of Alexander of Parma, where it became one of the sights of the time; and the Spaniards, accepting the omen of its original name, took it as a sign that the war was finished. And, indeed, it proved to be the last effort of the gallant people of Antwerp, for the city was taken on August 17, 1585, and so the first ironclad on record came to an unfortunate end. We are indebted to Mr. J. Coryton for the loan of the volume, "De Leone Belgico, 1588," from which our engraving is taken.—*The Graphic, London.*

AN IMPROVED CAR FENDER.

This is an efficient and simple safety device to be used at the front ends of electric and cable cars, to

prevent persons being run over by the cars. It has been patented by Mr. Benjamin Tranter, of No. 533 Park Avenue, Brooklyn, N. Y. From hangers at the front of the car is suspended a frame designed to be moved in and out at the car end, the front end of the frame resting on small wheels which run on the track, while at the lower ends of the suspension rods are rollers against which the side bars of the frame move without friction. The rear ends of these side bars are pivotally connected to swinging hangers on a trans-

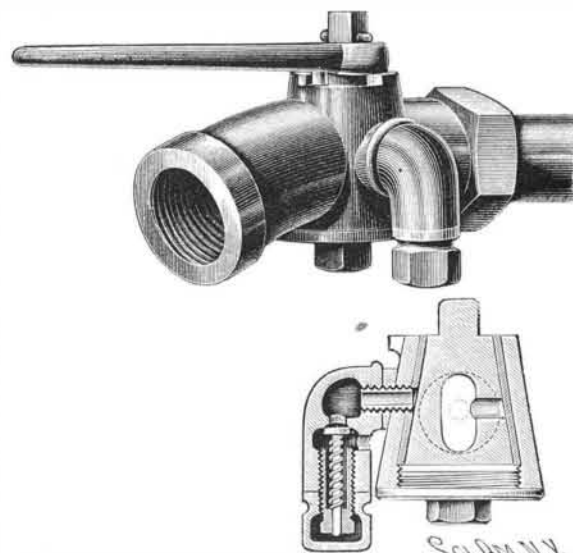


TRANTER'S CAR FENDER.

verse shaft beneath the car floor, and on this shaft is a crank, connected with a forwardly extending pitman pivoted to the lower end of a bent lever whose upper end forms a handle in front of the dashboard. The lever is fulcrumed in lugs on the front of the dashboard, and the front end of the pitman has several holes, so that it may be easily adjusted in relation to the lever. The transverse portion of the fender frame at the front is bent downward toward the track, and may have a rubber or leather covering, and to this portion is secured the front end of the netting, whose rear end is attached to a cross bar of the frame arranged a little below the car floor. The drawing shows in full lines the fender extended as when a person is likely to be run down, but when not in use as a safety fender, the upper end of the lever is thrown forward, as indicated by the dotted lines, swinging back the fender frame beneath the car, and causing its front portion to be drawn up slightly, so that the forward wheels are lifted off the track, in which position the fender is usually carried. The diagonal side braces, extending upward at opposite sides of the fender, may be employed or not as desired, the upper ends of these braces moving upward in slide boxes on vertical rods at the sides of the dashboard as the fender is withdrawn to its rear position.

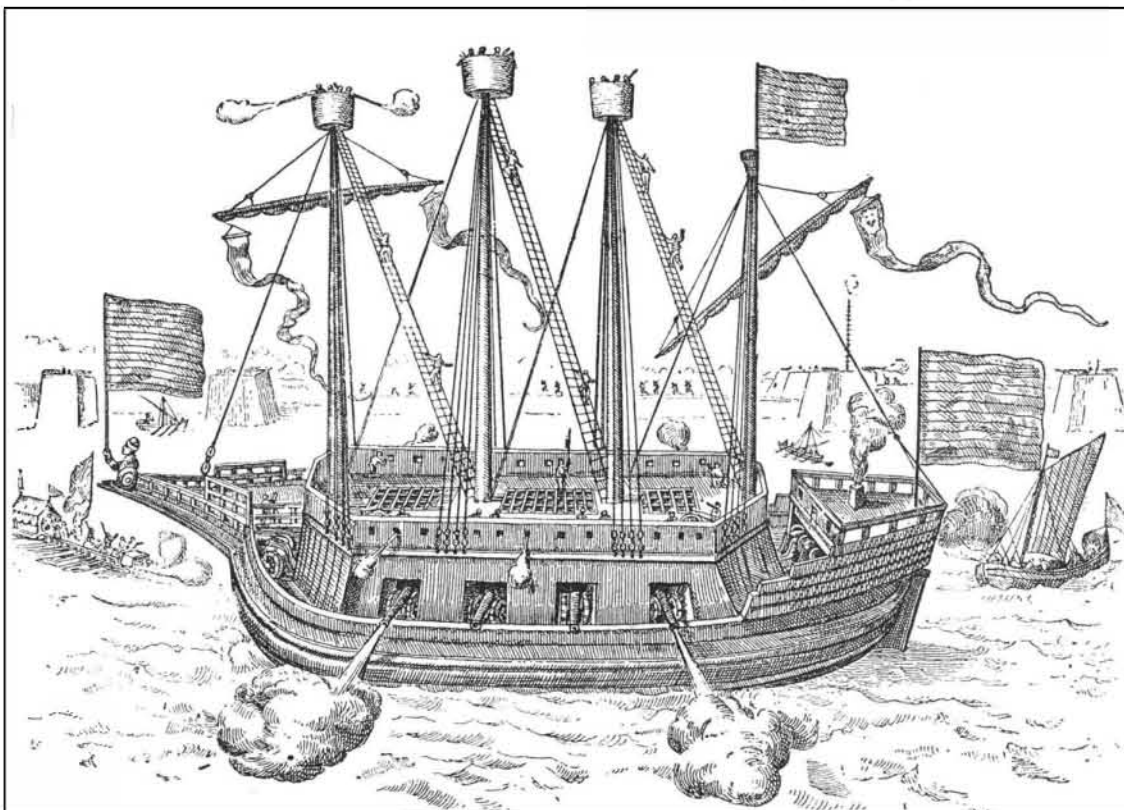
AN AIR BRAKE STOP COCK.

This is a cock of simple construction, arranged to apply the brakes when the cock is shut off and retain



O'LEARY'S TRAIN PIPE STOP COCK.

part of the air pressure in the train pipe, or prevent its reduction to zero, to aid in the release of the brakes when the cock is again opened. The improvement has been patented by Mr. Joseph O'Leary, of No. 228 Iowa Avenue, Memphis, Tenn. The cock has the usual casing, connected at its rear end with the train pipe and at its forward end with the coupling hose leading to the car ahead. Within the casing, as shown in the sectional view, turns the usual plug with a main opening connecting the train pipe with the coupling hose, and into this main opening leads a port adapted to connect the opening with the train pipe at the time the plug is given a quarter turn by means of the handle. When this turn is given to the



THE FIRST IRONCLAD, 1585.