of large bodies of troops, which has necessitated, with the hurried organization of the volunteer service, retaining the old regimental medical staff; but, with the present availability of Red Cross aids, it is believed most of the defects inherent thereto will be obviated.

The United States army ambulance is a model in its way, consisting of a body 48 × 90 inches, protected by a canopy top and movable leather curtains, mounted on four wheels by platform springs. With the seats in, it carries eight persons; with seats stowed, it admits two litters, side by side, the handles of which rest on and are secured to brackets; or one litter can be entered, and yet space reserved for four persons in sitting posture. Lockers at the sides and under the box seat afford storage for supplies and the appliances essential to "first aid," while beneath the box are two water tanks. Formerly a two-wheeled ambulance also received official sanction, of the same capacity as regards litters, but admitting of but four passengers in sitting posture. For the campaign in Cuba, it is understood mule litters have been provided for use in such localities as cannot be reached by wheeled vehicles, and the French cacolet—two chairs, resting pannier fashion on a mule's back, with a hooded shelter—has been advised.

The Red Cross ambulance, as recently adopted, differs slightly from that of the United States army. Constructed in much the same way, it admits of a second pair of stretchers being inserted half way between the first and the canopy top: and the water tanks, beneath the driver's seat, are arranged to be surrounded by ice: the top and curtains, moreover, are of canvas instead of leather; but leather padded litters replace the canvas stretchers of the army department.

No hard and fast rules can obtain, however, to any ambulance service. Both the character of the vehicles and the scope of their usefulness are necessarily modified by conditions and surroundings, and to meet the demands of military operations. Undoubtedly the present conflict will lead to many changes in medical military service and in medical organization, and such may entail a material modification of the ambulance and field hospital system. One of the great steps in advance, dictated by the exigencies of the present war, is the establishment of the hospital ships, such as the government steamer "Solace" and the Red Cross steamers "Relief" and "Red Cross."

One notable feature of Red Cross work brought out by the present war is the number of societies that have sprung into existence as auxiliaries. Every city and almost every town or village of considerable size possesses at least a "branch." Some of these, too, have greatly lightened the work of the Central Committee, by taking upon themselves certain lines of work. One of the greatest drawbacks, usually, to work of this character is the miscellaneous assortment of supplies forwarded, the useful often being neglected for the æsthetic, the amount in one line being greatly in excess of demand on one hand, on another equally deficient. Thus, one organization devotes all its energies to supplying a hospital launch, another to the procuring of hospital clothing, another to the forwarding of hospital delicacies, another to the furnishing ambulances, etc. Consequently, the supplies that reach the wounded and the hospitals are suitable to, and in consonance with, the demand. Far from being a charity, miscellaneous in its garnerings and applications, the Red Cross has assumed the character of a self-imposed, cheerful, definite taxation.

### Waterproof Placards.

Mix glue water with zinc-white, chalk or barium sulphate and paint the paper with this liquid. As soon as dry, apply another layer of soda waterglass with a little magnesia, and finally expose the paper for some days to a temperature of 25° C. The sheets thus prepared may remain under water or be exposed to dampness for a long time without any part of the writing or drawing becoming blurred.—Die Werkstatt.

### A RAILROAD ATTACHMENT FOR BICYCLES.

The invention which forms the subject of the accompanying engraving seeks to provide a simple attachment by which an ordinary bicycle can be used upon a railroad track, the bicycle running upon one rail, means being provided whereby it is held in position.

A RAILROAD ATTACHMENT FOR BICYCLES.

Below the front wheel of the bicycle, a frame is suspended from a forked brace fastened to the bicycle frame and from a bar running from the axis of the front wheel. On the lower portion of this suspended frame rollers are journaled to engage the track and the adjacent portion of the tire. At the rear of the wheel, about midway of its height, two additional rollers are journaled in the forked brace already mentioned, and engage the bicycle tire for the purpose of relieving the lower rollers of undue strains. The axes of these latter rollers are perpendicular to the periphery of the bicycle-wheel.

Beneath the rear wheel of the bicycle, a somewhat similar arrangement is employed. In this case the frame carries but a single roller and is suspended in position by a supporting brace attached to the bicycle frame and by a bar running from the bearing of the rear wheel. As in the device used on the front wheel, so here, the roller engages the inner side of the rail and the adjacent portion of the wheel.

In order to keep the bicycle in position on its track, a lateral frame is fastened to the lower brace and is provided at its outer end with a flanged wheel running upon the rail opposite that upon which the bicycle is mounted. The flange of this wheel is opposed to the flange devices on the bicycle, so as to keep the latter in position on the track.

The attachment in itself is lightly constructed. It can be removed from a bicycle and easily applied, and, moreover, can be packed in a case carried on the bicycle. A rider is thus enabled to use his wheel not only on ordinary roads, but also on railway tracks.

The attachment is the invention of Henry J. Otto and Arthur E. Wielsch, of Butte, Montana.

### RECOVERY OF GOLD FROM LOW GRADE ORES.

In the southern part of California mining is a familiar topic of the day among all classes. The wealthy are turning to this industry as a means of increasing their revenues, and the poor are engaging in it with the hope of becoming rich. The study of mineralogy, with the technicalities of mining, is the most popular of the many branches taken up by the Los Angeles Y. M. C. A. educational course this season. It is the first class of the kind conducted by this organization.

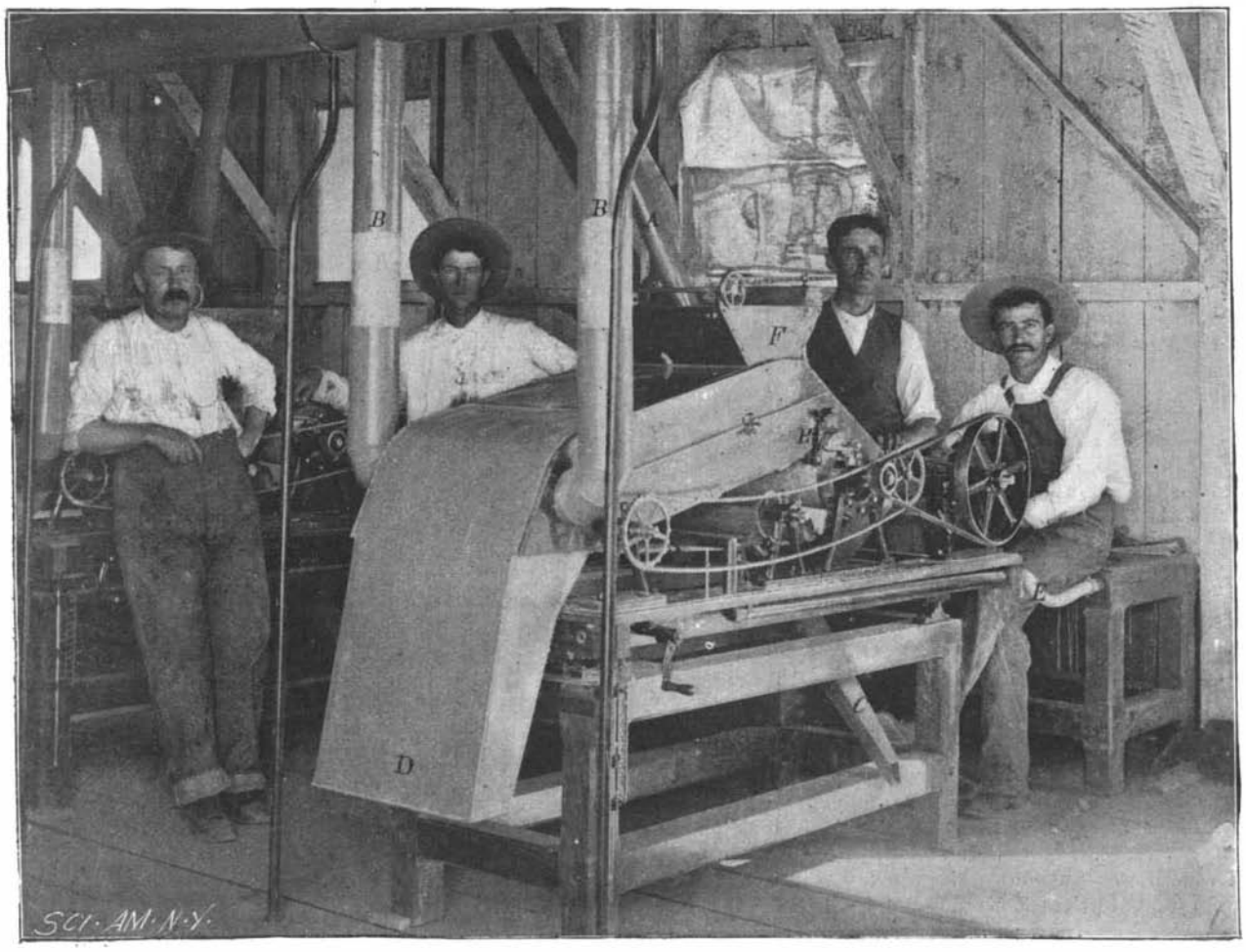
A large proportion of the 3,800 mines in Southern California, which yielded $1,360,000 in gold last year, are on the great desert lying just west of the Colorado River. The region, as large as several Eastern States put together, is full of resources that are yet unknown to the general public. The most promising mining district in California—the Rand, discovered two years ago—is in the heart of this desert, and already the towns of Randsburg and Johannesburg are thriving and comparatively comfortable places. Life here is infinitely preferable to the conditions on the Klondike, and if gold nuggets are not picked up so freely as in the Arctic region, neither is the search for them so hazardous or costly.

Scarcity of water and fuel, with the cost of transporting ore to mills and smelters remote from the mines, are drawbacks on the desert. More water will ultimately be discovered and developed; meanwhile, a dry process of treating ores would be of great value to this section and to all other arid mineral territories. Especially is some method needed by means of which low grade quartz may be made to yield a percentage of concentrates which will be profitable in bulk.

Such a process has recently been successfully tested in the Rand district, with new concentrating machines invented by an Eastern man, who has been in the habit of spending his winters in California, and was advised, when in Los Angeles last winter, to turn his attention to something which would benefit the mining interests of this section. He saw the difficulty, chiefly resulting from a lack of water, of handling the vast bodies of low grade ore which are found on the desert, and began to experiment with the dry concentrating process.

After the machines were perfected, they were viewed with approval by numerous mining men; and, in September, a plant was erected at Johannesburg, on the Alameda mine, where tests were recently made which gave excellent results.

Rock which had been cast aside, on the Alameda dump, as unprofitable to ship to a stamp mill, was put through a rotary crusher and reduced to what is known as "pulp" in mining parlance. It was then elevated by a conveyor to an inclined screen located in the second story of the mill, directly above the concentrators.




NEW METHOD OF CONCENTRATING GOLD BY THE DRY PROCESS.

The screen is octagon in cross section, covered with fine wire, and divided into four mesh spaces running from 100 to 40. It receives the pulp at the upper end, and as it slowly revolves, the crushed rock is thrown from one flat surface to another, gradually reaching the lower end, where all that passes over is returned to the mill to be ground again. The screened pulp is supplied to the concentrators in the room below through pipes, A, which lead down to a hopper, F, on the top of each machine. From the hopper the pulp falls upon an endless traveling screen, the upper half of which is inclosed in a rectangular box as shown in the illustration. Here it encounters two currents of air which are delivered by a rubber tube, E, and are admitted