

MECHANICS

The Air Brake

"A Classic Invention"

On the First Air-Brake's Maiden Trip It Saved the Life Of a Farmer Whose Horse Balked in Front of the Train

IMPROVEMENT IN STEAM-POWER BRAKE DEVICES. George Westinghouse, Jr., of Schenectady, N. Y. U. S. Patent No. 88,929, April 13, 1869.

MY INVENTION relates to the construction of power car-brake for railway-cars or other like vehicles, to be operated by compressed air or other elastic compressible fluid; and the nature of it consists, first, in the use of an auxiliary engine for compressing the air in reservoir, from which it is to be conducted by suitable pipes and applied to operating the brakes, and also for pumping feed-water into the boiler, either or both; second, in the construction of a reservoir for storing up the power to be derived from air or other elastic fluid under compression, such reservoir having a pipe or pipes leading to one or more brake-cylinders on or attached to each car, with a valve or cock in each pipe for turning on or off the supply of air; third, in the construction and combination of devices by which the power thus communicated to the piston of the brake-cylinder may be from it applied to operating an ordinary hand-brake, or any other known form of simple or compound brake; fourth, in the construction of an improved coupling for uniting the brake-pipe of contiguous cars, so made that when coupled they shall be always open for the passage of air to the brake-cylinders, but if uncoupled, when the brakes are down, the pressure of the air in the pipes will instantly close them. . . .

Advantages

The particular advantages connected with the apparatus described, in addition to those above referred to, are, that the brakes are under the control of the engineer, and can be instantaneously applied at any time, and with any degree of power within the strength of the machinery employed, and the brakes can be as instantaneously loosened. They are simple in construction, cheap-

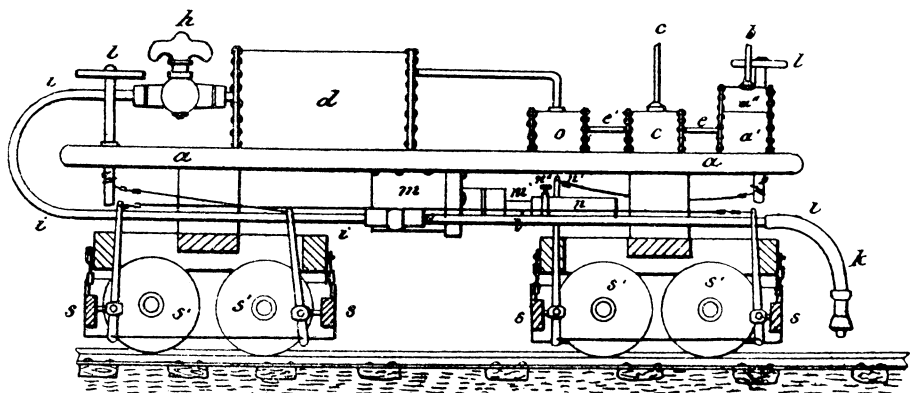
ly made, and can be applied to and used in connection with or used without the ordinary hand-brakes. By the use of the auxiliary engine the operation of the brakes is made independent of the operation of the locomotive, so that much or little power can be stored up in the reservoir *d* at any time, whether the locomotive be running fast or slow, or not at all; and, if desired, all the force of the air-pump can be applied to the brakes over and above the force than can be stored up in the reservoir. By this mode of operating brakes in connection with the couplings described, in case of accident the brakes may be instantaneously applied, and kept "on" till the whole train, or each separate car, if the car-couplings break, be brought to a complete stand. . . .

IMPROVEMENT IN STEAM AIR-BRAKES. George Westinghouse, Jr., of Pittsburgh, Pa. U. S. Patent No. 124,405, March 5, 1872.

My present invention relates to sundry improvements in steam-power air-brakes for railway use. In such brakes, as heretofore commonly used, an auxiliary steam engine, arranged on the locomotive by means of an air-pump, compresses air into a main reservoir. A pipe leads from this back under the cars, and by a branch-pipe from it to a brake-

cylinder under each car. The compressed air is applied to a piston, the steam of which, directly or indirectly, actuates the ordinary brake-levers. The pipes are coupled together between the cars by couplings, the valves of which are automatic in their operation; and these couplings are arranged as described in Letters Patent granted to me August 8, 1871.

I now propose further to improve this system of railway brakes, first, by providing each car with an auxiliary reservoir, which shall be filled from the main reservoir; second, by such connections from each such auxiliary reservoir to the brake-cylinder of each car that, in case of the rupture of the main reservoir or of any of the brake-pipes, the brakes will be applied by means of compressed air from such auxiliary reservoir; third, by a double pipe-connection from the main reservoir to the brake-cylinder of each car with such intermediate connections, that either or both pipes may be in use at once for conveying compressed air, or, if either is broken at any point, communication with it will be automatically closed, and the other will perform all necessary functions; fourth, by such valve and port connections between the brake-pipes and the brake cylinders, that one brake pipe may, while the brakes are off and the train is running, be kept full of compressed air from the main reservoir, and so constitute, mechanically, a continuous reservoir from one end of the train to the (Please turn page)



AIR-BRAKE ON A CAR

*A represents a platform-car, on which is mounted an auxiliary engine, *a*, *a'*, a feed-water-pumping cylinder, *c*, and an air-pump, *o*, and an air-reservoir, *d*. (Drawing accompanying Patent No. 88,929.)*

other; fifth, by bringing this continuous reservoir-pipe into communication with the brake-cylinders at pleasure, through the agency of compressed air admitted from the main reservoir into the other brake-pipe; sixth, by such construction and arrangement of intermediate devices that, by simply discharging compressed air from this continuous reservoir-pipe, a communication will be opened from the auxiliary reservoir to the brake-cylinder, whereby the brakes will be applied; seventh, by a system of valves and ports, which shall effectuate all these results by their automatic action, except as their action is governed by the engineer at the main reservoir.

Science News Letter, June 11, 1932

PSYCHOLOGY

Intelligence Tests Not Good For Measuring Immigrants

INTELLIGENCE tests now available must be revised or the methods of scoring changed before they are satisfactory for testing immigrants, it appears from a report of Dr. Lawrence Kolb, senior surgeon of the U. S. Public Health Service, before the meeting of the American Association for the Study of the Feebleminded.

The law now provides that no mental defectives shall be admitted to this country. But although psychologists have devised special tests which do not require the use of language, the scores on these tests do not give a true picture of the mental ability of the person tested, Dr. Kolb found. His conclusion is based on the results of tests given to 3,000 persons desiring to enter this country from Europe.

Men do conspicuously better on these non-verbal, or performance tests than do women, although there is no reason to suppose that the men are more intelligent than the women. Children able to read and write do the tests as well as their illiterate mothers, and, because of the difference in age attain a higher intelligence quotient, which is mental age divided by actual age. Young adults do better than older adults. And the difference between the illiterates and those who can read is very high.

These facts seem to indicate that ability on the tests depends to some extent at least upon the stimulating character of the environment and upon the education as well as upon innate capacity which they are supposed to measure, Dr. Kolb believes.

Science News Letter, June 11, 1932

SOCIOLOGY

Depression and Race Suicide Are Blamed on Rush to City

ECONOMIC problems such as the present depression, as well as sociological problems like race suicide, may have their origin in the recent rush of people to large cities, it was pointed out by an address of Dr. Clarence G. Campbell, president of the Eugenics Research Association.

The city population of the United States was greater than the rural population by 5.8 per cent. in 1920, but by 1930 the excess had jumped to 28.3 per cent., Dr. Campbell told the meeting. This change in the population has been associated with important economic changes, he pointed out.

If prices and production in both city and country were so arranged that the city dwellers used all the produce of the country and paid sufficient to enable the rural population to absorb all the urban manufactures, then all would be well, he said.

"But suppose on the other hand that the urban community, from some cause, places a higher relative value upon its products and its services, and takes the arbitrary stand that the total rural products are only equivalent in value to two-thirds, say, of its own total production. For a time it might continue to produce this excess third, under the impression that the rural community, or parties unknown, would come forward with something to exchange for it. But it would

before long cease to produce this superfluous third which it could not exchange, and the urban element concerned in this production would be without employment and without means to exchange for its substance."

Such a situation, Dr. Campbell said, leads to the condition with which we have become familiar of great surpluses, both of urban and of rural products, which can find no market for their exchange, and of great numbers of able individuals who cannot be employed.

Science News Letter, June 11, 1932

ECONOMICS

Rubber Cheaper Than Wood Used for Kindling in England

RAW RUBBER now selling for less than kindling wood is being used to light open fires in many British homes. Cut into strips, one pound of rubber costing about five cents will serve to kindle seven or eight ordinary fires. Although not generally realized, crude rubber burns easily without any offensive smell. The British owners of rubber plantation stocks are encouraging the use of rubber in starting the coal fires of England in order to dispose of the excess that has depressed the price below the cost of production.

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