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## Improved Apparatus for Well Boring and Hoisting.

The discovery of the commercial value of mineral oil has greatly stimulated the efforts of inventors to improve upon the crude attempts first made to reach the buried treasures of the earth; yet the old walking beam and samson post are still adhered to, probably because of their simplicity and cheapness. The object of the apparatus herewith illustrated is to provide an improved device for boring wells. It is also adapted for pumping and hoisting purposes. Its operation is easily understood, as the parts are simple in character and few.

A level platform, A, circular in form, and either a disk or a rim, is laid upon the ground, and the platform, B, revolves upon it by means of trucks or rollers. At the center of this platform is a well-hole, and rising from its side is the upright, C. Under the platform, B, is a fixed gear wheel in which the wheel, D, meshes. The platform being rotated, by horse or any other power, its revolution gives motion to the wheel, D. On the same shaft with this gear is a double lever, having circumferential slots in either arm, at equal distances from the center. In front of this is a similar lever or double arm, E, having pins in its rear face which play in the segmental slots, and by which the arm, E, is carried around with the shaft of D. In this arm is a longitudinal slot, in which moves loosely a box to which the connecting rod, F, is pivoted, which is secured at the other end to a box which slides up and down in a corresponding slot in the upright, C.

As the shaft, D, rotates the arm, E, is carried around, and soon after the box carrying the connecting rod has passed the lower center it slides to the upper end of the arm, allowing the drill, F, to fall, when the continued revolution of the shaft again raises it, to fall again at the next half revolution. By this means there are two full strokes given to each one revolution of the wheel, D. The drill may be attached to the upper block directly, or after the hole has progressed, to the knob, G, on the box by a rope passing over the pulley at the top of the uprights. The rope passes around the shaft, D, thence on the drum or winch, H, to be let out as demanded by the progress of the work. The sand-pump is always suspended ready for use from the hinged pulley block, I, by a rope winding on the barrel of the winch, J. The drill can easily be removed by the winch, H, and the sand-pump lowered into the well without the trouble of disconnecting the drill,

For pumping purposes this machine appears to be equally efficient. It can be worked very rapidly by having a large wheel under the platform, B, even when the horse or other motive power is traveling slowly. The rotation of the platform insures a gradual rotation of the drill, so that at every stroke it presents its cutting edge at a different angle, and the hole is always bored perfectly round.

A patent was issued March 6, 1866, to W. C.

nishes the data on which his statements are founded, and the Worcester and Western railways, between Boston and Albany, are those to which his remarks are specially applied.

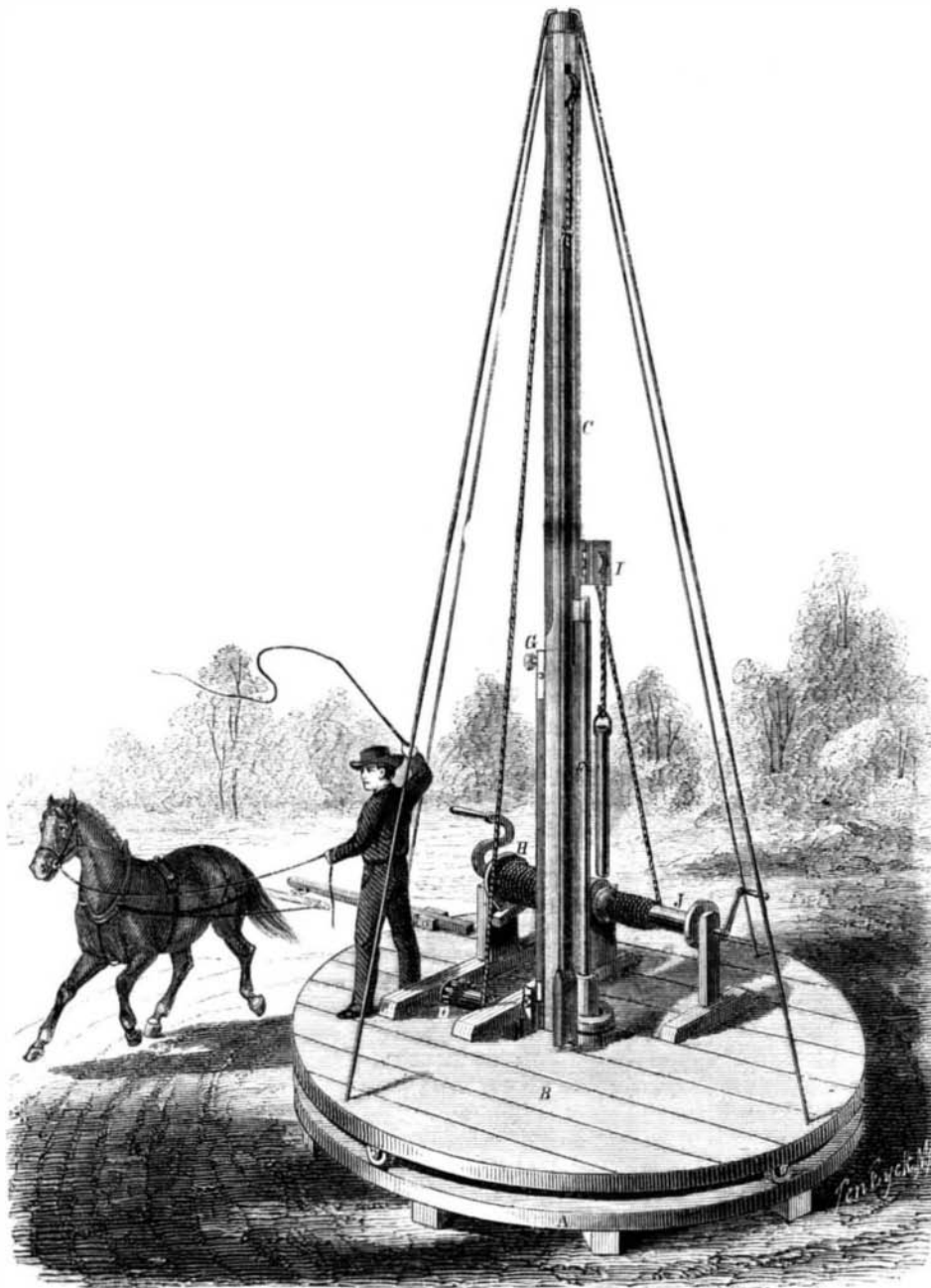
Quoting from the report of the English Board of Trade for the year 1863, the average expenditure per train, taking all the railroads in the United Kingdom, is placed at 2s. 7d., or 62 cents per mile. Of this sum the cost of maintaining the way and works, the locomotive power, and the repairs and renewals of cars, amounts to 1s. 2½d., or 29 cents; the remaining items include the Government tax, compensation for personal injury, legal expenses, and other expenditures which must be paid whether the trains run or not.

In regard to the traction of a locomotive, 1,000 passengers, or 300 tons of freight, are considered as a fair maximum load on the majority of the English railways. When the track is laid, and the road is fully equipped, the results of full trains at the present prices would be, on the roads under discussion, 10,000 tons on the five daily freight trains at \$7, and 6,000 passengers, in six trains, at \$6 each, giving a total of \$106,000; but, by the estimate given above, the actual cost is only \$124 for each train, yet, to cover all expenditures, call it \$159. Then 27 passengers pay the total cost, and 973 are carried free. For freight alone, 23 tons defray the whole expense, and 177 go free.

A prevalent opinion is that the charges on a railroad must be proportioned to the cost of construction. Now it is found that the English railways on which the greatest amount of capital per mile has been expended, are those on which the fares are the lowest. The Charing Cross Railway cost a million and a-half sterling, or \$7,500,000 in gold, per mile, yet passengers are carried at a lower rate than on some roads constructed at a hundredth

part of that cost. When the actual fares exceed the expense incurred in the conveyance, it becomes a mere question of numbers as to what fares best pay. English experience also proves that any decrease in price of transportation is immediately followed by a nearly corresponding increase in business.

The effect of reducing fares, on dividends, is seen in the contest between the Edinburgh and Glasgow, and the Caledonian railways, connecting these two cities, which, with their immediate vicinities, have a population of 600,000 inhabitants. During the contest the fares were reduced to one-eighth of the ordinary charges; the loss in dividends, resulting,



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McGill and A. J. Gibson, of Cincinnati, Ohio. For further information address A. V. Stewart, No. 14 Public Landing, Cincinnati, Ohio, or W. C. McGill, No. 277 Walnut street, same city.

## REDUCTION OF RAILWAY CHARGES.

Hon. Josiah Quincy delivered, last week, an address before the Boston Board of Trade warmly advocating the possession by the several States of all the important railway lines, believing that thereby the charges for passage and transportation of freight would be reduced to correspond with the mere cost of operation. The experience of English roads fur-

amounted in the one company to one, and in the other to less than one-half, per cent per annum.

Should the Worcester and Western roads lower their charges, not to one-eighth, but to one-sixth, with a similar increase of business, the difference to the shareholders would consist in receiving nine instead of ten per cent, annually, on their investments, a loss of \$100,000 to the roads and a gain of millions to the community.

According to General Stark, freight is now carried by the tun on some of our Western roads for one cent per mile. At this rate a tun could be taken from Albany to Boston for two dollars, the cars in both cases returning empty. As a tun is equivalent to two passengers, they could be taken between the two cities for one dollar each.

However great may be the benefits accruing to the people from the low-fare system, they are unattainable under the present mode of management. The plan proposed for securing these advantages is the purchase of the roads referred to, for an equitable price, payment to be made by the issue of bonds for fifty years at five per cent; the grant of a permanent lease to the city of Boston—the city paying the interest on the loans—to keep the road and stock in repair, and to use the surplus after making all the facilities required by the enlargement of business.

Referring to a movement of like character in England, the address closed with expressing the desire that Massachusetts should inaugurate the movement whose universal adoption is merely a question of time.

#### INTERESTING OFFICIAL STATISTICS.

The departmental reports are rather barren of instruction appropriate to our pages. We collect a few items:

##### POSTAL MONEY ORDERS.

The money-order offices have been doubled in number (769 against 347 last year) and the business has been more than tripled. The number of orders issued has been nearly a quarter of a million (243,609), and the amount of money transmitted nearly four millions of dollars (\$3,977,250 28), in sums averaging \$16 32. The commissions paid on these orders amounted in round numbers to \$35,000, and the expenses to \$28,000; profits \$7,000. The system has now paid an excess of \$90 over all its expenses from the start.

##### SOUTHERN RAILROADS.

The domestic mail-service has been extended 38,581 miles; chiefly in the lately insurgent states. Nine tenths of the railroads in the South are now in operation, consisting of ninety roads with an aggregate length of 8,170 miles; leaving 14 roads, with a length of 696 miles, idle.

##### ACTIVE FOREIGN CORRESPONDENCE.

The foreign postage collected has been nearly half a million dollars greater than last year. Over nine millions of letters have been exchanged with foreign countries, about an equal number passing each way. The increase in the European correspondence over that of 1865, is remarkable, amounting to 1,851,330 letters. Over four millions of newspapers were exchanged with foreign countries, and more than two-thirds of these went from the United States: increase, only about 30,000.

##### CONSUMPTION OF POSTAGE STAMPS.

Twenty tuns, or, by superficial measurement, forty-eight and a half square miles, of postage stamps, have been used during the year: enough to roof a large township, with all its houses, barns, churches, gardens, forests and farms; or, if you choose to make a ribbon of them, enough to reach nearly from the equator to either pole, or twice the length of the Mississippi river. So that if everybody would be obliging enough to use the government stamp on the envelope itself, the mere omission of these little extra bits of paper would lighten the mail-bags by more than forty thousand pounds, and save in paper fifteen or twenty thousand dollars. The Postmaster General does not impart this information in so many words, but he assures us that nearly 350 millions of stamps have been sold in the year past, beside nearly forty millions of stamped envelopes;

and a simple calculation reduces the story to the more tangible form we have given it.

##### THE NAVY.

Material and occasion for numerous suggestions of great interest might be found in the present state of naval affairs; but Secretary Welles is popularly supposed to be a man not easily roused, and his report is hardly of a rousing character. There is nothing new in the references made to our successful ocean monitors, or in the suggestions advanced on the subject. A great increase of ship-houses, building shops, dry docks and building materials, at the navy yards, the renovation of the yards at Norfolk and Pensacola, and the settlement of a fresh-water station for iron bottoms, are strongly urged. There is nothing worth mentioning about harbor defenses. The universal deterioration and decrease of seamen is referred to, and an improvement in their condition, which is indispensable to induce men in these days to seek the dangerous calling of sailors, is recommended in general terms. Economical management of the liberal war appropriations to the Navy Department has enabled it to complete all the vessels and engines contracted for before the close of the war, leaving a residue of about fifty millions which can be relinquished to the Treasury. The navy does not appear to be improving its present leisure by any service of a scientific character.

##### COAST DEFENSES.

As everybody knows, the entrances of the New York and other harbors are being lined with tremendous weights of metal, in batteries of enormous length, of fifteen and twenty-inch guns. Surveys of the lakes are energetically prosecuted.

##### SMALL-ARMS.

A plan for converting Springfield muskets into breech-loaders more efficient than the Prussian needle gun, and at a comparatively small cost; also models of new breech-loaders for the various arms of the service, have been decided on by the special Board of officers appointed for that purpose, whose lengthened experiments have often been publicly referred to. The manufacture and alteration are already vigorously going forward, but the Secretary does not deign to throw any light upon what he is doing. Nobody out of the department seems to know what improvements have been adopted.

##### FEVERISH PRICES AND ENFEEBLED GROWTH.

The Treasury report imputes to a redundant currency and a fallacious inflation of values, a decline in American enterprise, on sea and land, exhibited in the slow construction of needed dwellings and manufactories, in the abandonment or inactivity of most of our ship yards, and in a decrease of our tonnage clearances in foreign trade from upward of six millions in 1860 to less than three and a half millions in 1866, while the foreign tonnage cleared from our ports increased from two and a half to four and a half millions. The Secretary, that is, does not see in the stifling of our ocean enterprise by British Confederate privateers during the war, adequate cause for its continued torpor after two years of peace.

##### GOLD PRODUCT.

The value of gold assessed for Internal Revenue the past year has been \$81,389,541. Of this amount, \$70,032,805 were assessed on the Pacific side; twenty-five per cent of the whole product being estimated as having escaped assessment. Adding this, and allowing about half the gold assessed in the East to be foreign, the total domestic production is estimated at \$93,219,374; an increase of \$19,675,015, in comparison with 1865.

##### NATIONAL BANKING SYSTEM.

Only eleven banking institutions have been converted into national banks, in the year ending Oct. 1, 1866. Fifty-one new national banks have been organized. Sixteen are closing or closed, and 1,647 are in active operation. Aggregate capital paid in, about 418 millions of dollars; bonds to secure circulation, about 330 millions; circulation not quite 300 millions, being an increase of about 100 millions, reduced to about fifty millions by State circulation retired by converted banks. Total resources \$1,525,493,960; liabilities for circulation and deposits \$1,024,274,386; leaving a surplus of \$501,221,574 for capital and earning.

##### NEW YORK THE METROPOLIS.

Every national bank in the United States is obliged by the necessities of business, to keep an account in New York; and about 1,000 of them voluntarily redeem in New York, of all the seventeen cities from which they are allowed by law to choose. The necessary principle of requiring all national banks to receive each other's notes at par, while it would be manifestly unsound policy to compel private creditors to receive them as legal tender, throws great risk and periodical embarrassment upon the banks at the centers of trade where circulation accumulates, and furnishes an unanswerable reason, in the opinion of the Controller of the Currency, for requiring all national banks to redeem at one or another of the great centers—in New York, Boston, Philadelphia, or better still, in New York alone.

##### PUBLIC LANDS.

The whole public domain now contains nearly 1,500 millions of acres, of which only about one-third have been surveyed. Upward of four and a half millions have been disposed of in the year, of which only about 388,000 acres were sold, while nearly two millions of acres were taken up by settlers under the homestead act, nearly a million and a quarter of swamp lands were conceded to the States (making over 43 millions in all), and the rest were absorbed by railroads, military warrants and agricultural colleges. Measures are recommended for promoting the planting and growth of timber on the public domain.

##### PATENTS.

There were 14,039 applications for patents in 1866; about 3,000 more than in any previous year. Of these, 10,130 were granted, of which 8,716 have been issued.

##### PENSIONS.

It is a singular fact that although but one Revolutionary pensioner—Samuel Downing, of Edinburg, Saratoga county, N. Y.—now survives, there are no less than 931 widows of Revolutionary soldiers still on the pension rolls. The greater longevity of women will not account for this enormous discrepancy, and the fact that pensioners and annuitants live long, seems equally in favor of both sexes. Of course, the widows of those killed in battle swelled the proportion of female pensioners very largely, but this could not have multiplied it 900 times, hardly 10 times. Probably, in consideration that "none but the brave deserve the fair" (not to speak of the pensions) the surviving heroes were generally and even repeatedly blessed with youthful and blooming brides. There are now, in round numbers, 45,000 invalids, and 70,000 widows and relatives on the rolls, at an annual cost of eleven and a-half millions of dollars.

##### A New Caustic.

Perhaps we should rather have headed this item "an old bleacher," instead of a new caustic. A Mr. Augustus Barnes proposes to take out a patent for removing spots, moles, naevi, and other diseased conditions of the skin, by the action of sunlight concentrated through a lens. Dr. P. W. Ellsworth, of Hartford, in the *Medical and Surgical Reporter*, vouches for the removal of a naevus covering four or five square inches of the face, of a deep cherry red color, approaching purple, and covered with knobs of condensed tissue an eighth of an inch high. After two applications, every knob had disappeared, the skin had gained a natural color, and, as a deformity, the naevus was practically cured. Mr. Barnes professes also to have removed small tumors, to have produced a true and healthy skin on the surface affected by ichthyosis, and to have high expectations in regard to lupus and incipient cancer. The prospects of the colored race also open a boundless field for speculation under the power of Mr. Barnes's magic lens.

BREAD, beer and buttermilk (and the same is partially true of butter), directly after being made, make a rapid exchange of carbon for oxygen, with a proportional improvement in wholesomeness. Bread, when thus ripened, is computed to contain twenty per cent, more of nutriment than when hot from the oven. The change in both taste and texture is very marked. It is important to have all