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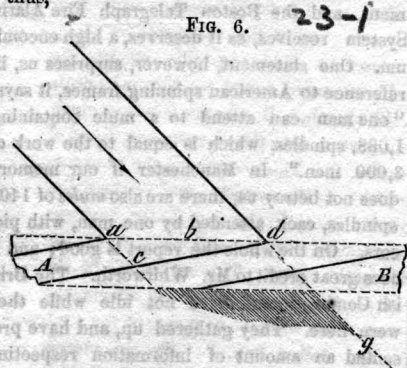
enters the wheel, add that of the effluent water, less that of the wheel; multiply this sum by the velocity of the wheel, and by the weight of water that escapes per second, and again by the square of the cosine of the angle of deflection of the water from the plane of rotation or tangent of the wheel; and divide the product by the velocity acquired by falling one second, (32) and the quotient will be the effect per second.

THE VELOCITY OF THE WHEEL—28. One feature in the action of the turbine deserves further notice. Practical men have remarked that the turbine revolves oftener, under similar circumstances, than other wheels do; and those acquainted with hydrodynamics have observed that they move faster than the water which propels them; yet writers seem to doubt the fact. "How is this?" they ask; "if the wheel out-runs the water, where does it get its power from?"

It was demonstrated in article 22, that, to produce a maximum effect, the wheel should move just as fast as the water issues; and it was further shown that when the wheel moves one half faster than the water issues, the effect would be diminished only 25 per cent. While the water issues with a velocity of 16 feet per second, the periphery of the wheel will move with a velocity of 24 feet per second. Thus the observations of practical men are verified by scientific investigation.

There is, however, another principle of action brought to bear on the turbine wheel in most cases, causing it to revolve faster than the water. By this principle, although it may appear paradoxical to some, a wheel may be made to revolve several times as fast as the water issues, and to discharge two or three times the quantity of water that is due the size of the issues and height of the head.

It is this principle that enables vessels to sail laterally to the direction of the wind, and causes the sails of windmills to move faster than the wind does which impels them. As applied to water wheels it may be illustrated by a figure, thus,



Let C represent a portion of a flume, or chute of water, and AB a portion of a wheel with plain thin guides. Let the distance from the top of the guide at *a* to *c*, be only one-fourth the distance from *a* to *d*. Then, if the wheel move with such velocity, in the direction from *a* to *d*, that while the water will move from *a* to *c*, the top of the bucket at *a* will move to *d*, the wheel will move with four times the velocity due the head of water. Moreover the water will not be impeded by the wheel, but will pass on towards *g* with a velocity equal to that with which it

would move were the wheel removed. But should the wheel be so obstructed that the top of the guide at *a* would only reach *b*, half way to *d*, while the water from under the head would reach from *a* to *c*, the water will then be deflected by the guides, and will impel the wheel forward with a certain force, although the wheel is moving twice as fast as the water would issue from under the head. 23-2

Deducing a coefficient of effect for this machine is quite complex, involving problems in trigonometry, but as the water acts by deflection, and does not lose its velocity in passing through the wheel, the percentage of the power realized is not great.

This principle is brought to bear in a greater or less degree, on all turbine wheels which have the inlet larger than the outlet, or that move faster than the water enters; increasing their velocity, but diminishing the effect.

Hally or some astronomer, investigated the orbit of a comet, predicting its return at a certain time. But it did not appear as predicted. On reviewing the investigation, he found the influence of the planets had been neglected, and that the great planet Jupiter had entirely changed its orbit. He then predicted its return with considerable exactness. Astronomers knew that the planets would influence the motion of bodies, but had not thought of this when investigating the orbits and motion of comets.

Thus it is with those who have attempted an investigation of the action of water on turbine wheels—well known principles which govern their action are left out of the matter, and the consequence is a failure.

JAMES B. CONGER.

Jackson, Tenn.

Meeting in Favor of a Passenger Railroad and Water Works—On Tuesday evening, a meeting of the citizens residing in the upper wards of the city was held in the Odd Fellows' Hall, Frankford, for the purpose of taking into consideration the propriety of adopting measures to obtain a supply of water, and also to build a passenger railroad. The meeting was large and composed principally of the wealthy and influential residents living in those parts. The meeting was organized by calling Peter Carter, Esq., to the Chair, and appointing Isaac Shallcross and W. J. Hilliday Secretaries. The object of the meeting was stated by Jos. Deal, Esq., after which remarks were made by several gentlemen and the practicability of the matter discussed. Nathan Hites, the member of Select Council from 23d ward, was of the opinion that the water-works could be obtained without much difficulty, as those residing in the old Districts of Kensington and Richmond would be willing to any change which would insure them a sufficient supply of wholesome and pure water. On motion, a committee of nine was appointed to obtain signatures to a petition to Councils, praying for the creation of a water-works somewhere above Frankford. A similar one was also appointed to petition the Legislature to grant a charter for a railroad to connect with the old borough of Frankford and the old city proper. The meeting then adjourned to meet at the call of the officers. 23-3

The District of Moyamensing.—This district comprises a portion of the old city which at the landing of William Penn was occupied by the Swedes, who had settled there as early as 1637. Within the three districts of Southwark, Moyamensing and Passyunk there were, out of the 7000 acres embraced within them, more than 3000 of marsh land, watered by the waters of the Delaware and Schuylkill rivers at high water. A map, published in 1681, represents fully one-half as being marsh. This waste land was gradually reclaimed by means of banks, ditches and sluices, and now forms one of the most productive sections of country in the vicinity of the city. The Swedes being conquered by the Dutch in 1655, and the latter by the English in 1661, the country was considered a part of New York until the grant to Penn was issued in 1682. A grant was issued May 3d, 1671, by Francis Loveless, Esq., Governor General under his Royal Highness, the Duke of York and Albany, confirming to Sven Gunderson, Sven Swanson, Ole Swanson, and Andies Swenson, the Wicacoa tract, containing 200 acres, at a quit-rent of eight bushels of winter wheat to the use of his Majesty. The boundary of this tract was as follows: beginning on the Delaware a short distance north of Shippin street, thence westward, verging towards Cedar street, striking it between Eighth and Ninth streets, thence along the south side of Cedar street to a point about six perches east of Shippin lane, thence southward parallel with Shippin lane to a corner a short distance south of Federal and west of Twelfth street, probably the northwest corner of the parade ground lot; thence along the said creek to the Delaware, and thence to the place of beginning. The eastern portion of this tract, bounded by the Passyunk, was erected into the district of Southwark, March 26, 1702, but the first act of the Legislature in relation to the township of Moyamensing was passed March 26, 1808, when Philip Pelz, John Kessler and John Maitland were appointed Land Commissioners to regulate the streets, direct the paving of footways, and levy a tax for sinking wells, &c., within the bounds of South and Federal streets, and Passyunk road and the Passyunk boundary. The act incorporating the township was passed March 24, 1816, under which the first election for nine Commissioners was held in March 1813, at the house of William Davis, in South Sixth street, the third dwelling below Fitzwater street, on the west side, now occupied by a baker. The water-house was also located there, and this building was used as the Hall for many years.

The lot upon which the hall was built, is 160 feet front, by 200 in depth, and was purchased in 1833, for the sum of \$3,333.33. The building, having a handsome marble front, cupola, and clock, was built and occupied, in November, 1831. The cost, for the building alone, was \$25,578 18, and the entire cost for ground, building and clock, was \$29,686 01.

The early minutes of the board having been lost or mislaid, no abstract of its doings can be included in this sketch, for want of the necessary material. The first officers elected by the board, were as follows:—Archibald Binney, President; R. Ronaldson, Treasurer; Charles O'Hara, Clerk, and J. McCann, Superintendent. The following is the list of Presidents, in the order of their election:—Archibald Binney, 1813; John Maitland, 1815; Daniel Gilroy, 1816; Thomas Dixey, 1819; William Wallace, 1820; Robert L. Longhead, 1821; Joshua Raybold, 1825; James Esne, Jr., 1826; George Kirkpatrick, 1829; Jacob Thomas, 1830; Thomas Gilroy, (June) 1833; James Maxwell, (December) 1833; Jacob Thomas, 1835; George Kirkpatrick, 1837; Francis Lyons, 1838; James Esne, Jr., 1841; William Corbit, 1843; Samuel F. Reed, 1845; John S. Thackray, 1847; Andrew Miller, 1849; John G. Ringland, 1850; John K. Longhain, and Boyle, the present incumbent.

The list of clerks of the Board is not complete, the following being all that can be furnished:—Chas. O'Hara, 1813; G. Fagle, 1822; H. Helmuth, 1831; E. McGowan, 1840; J. M. Raebold, 1842; Wm. H. Fagan, 1849; Thomas Clark, 1853, the present incumbent. This Township, before being incorporated, purchased a property on the Irish Tract Lane, which was improved and used for many years as an Almshouse, where the poor of the District were provided with a home. The deed is dated September 17, 1812, and the Township supported its own poor until the passage of the act of April 29, 1844, which allowed the poor to be admitted into the county Almshouse. The poor-house was sold Oct. 10, 1846, for \$4500.

The politics of the Board was mostly Whig until 1837, but since that time it has been invariably Democratic. The elections in former years held in the District, were occasionally attended with much disorder. In 1835, a liberty-pole was cut down on election night, and a riot ensuing, several of the dwellings opposite the Hall, belonging to Mr. Robb, were destroyed by fire. A better state of things now prevails, not only in this section, but throughout the city, in consequence of the establishment of the precinct system, and the creation of the Marshall's police.

The corporate title was originally the Township of Moyamensing, but by the act of April 5, 1818, the title was changed to the District, and its western boundary extended to the river Schuylkill. An alteration was subsequently made of the dividing line between the districts of Southwark and Moyamensing, east of Passyunk road.

The bulk and limits of the district are well supplied with water and gas, and from the fact that the property owners pay for the paving of the streets, there is but little to be done within the bounds where improvements have been commenced. A recent vote of the Board has directed the gas pipes to be laid out to the junction of Passyunk road and Broad street, where an extensive plot of ground is to be laid out in streets, and will soon be covered with substantial improvements. The extension of Broad street to League Island, and the laying out of that street with a boulevard in the centre, planted with trees, has rendered this a favorite location for the purchase of land by joint stock associations, the members of which secure for themselves home-stands by this new system.

By the annual statement, recently presented, of the financial affairs of the district, the funded debt is \$113,193 15; other floating debt, \$36,112 13, making the total of indebtedness, \$149,305 28. The credits sum up \$148,893 43, by which the annual deficit is only \$411 85. The credits, in part, consist of the Hall, \$35,000; two squares of markets, \$16,000; registered taxes, \$13,577 26, and taxes of 1853; unpaid, \$37,344 09.

The following are the present officers of the District:

President—Michael C. Boyle; Treasurer—John McGettigan; Clerk—Thomas Clark; Solicitor—Edward C. Quin; Commissioners—Henry Logan, John Galligher, James McGee, Arthur Hughes, Charles Harmer, Charles McDonough, Nicholas Walsh, Harrison V. Gavford, Richard H. Wexill, Philip Kelly, William Callan, Michael McGowan.

NOTICE—A MEETING OF THE BOARD OF THE DISTRICT OF MOYAMENSING, WILL BE HELD AT THE HALL, ON WEDNESDAY, THE 11th INST., AT 8 O'CLOCK. THE BUSINESS OF THE DISTRICT IS TO BE CONSIDERED.