

# Scientific American.

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY AND MANUFACTURES.

Vol. XIII—No. 7.  
(NEW SERIES.)

NEW YORK, AUGUST 12, 1865.

\$3 PER ANNUM  
IN ADVANCE.

## Improved Radial Drill Press.

There is no more indispensable machine in metal-working establishments than a good drill press; and a great deal of ingenuity can be shown in planning them so as to obtain the greatest possible efficiency for the least weight of metal and cost. The kind of work that has to be done under a drill press varies greatly even in shops where one article is manufactured; as, for instance, turbine wheels. One branch demanding long drills to reach past shoulders on the job, which prevent the spindle from being run down, and another requiring the table to be turned out of the way entirely so that the work may set on the floor, or still other jobs running from small holes to large ones. For these reasons it is desirable to have the machine well arranged to accommodate all classes, and we believe the necessary ends are combined in this one.

In detail it comprises a base, A—to be set in the floor, on a foundation of brick work—an upright column, B, and a radiating arm, C, fitted to a neck at the top of the column, and traversing freely in all directions. In this slides the head carrying the drill spindle, which is moved backward and upward by a rack (not shown in the engraving), with pinion and hand wheels, D, one of which is on each side of the machine. The power is derived from a countershaft overhead, a belt from which drives the horizontal shaft, E, passing through a bearing in the side of the column. From this the motion is communicated by two pairs of miter wheels and an upright shaft in the center of the column, to the shaft, F, passing through a sleeve or barrel running in bearings on top of the arm, and provided with a feather, to allow it to slide freely with the motion of the head. The drill spindle is driven by a pair of bevel wheels in the usual manner, and the head in which it runs, with the frame-work carrying the feed wheels and screw, slides within the arm, which is open from end to end and planed up on the bearing surfaces.

It will be seen that the arm or swing is allowed to traverse freely in all directions—the only interference being from the driving belt—and that there is secured besides a longitudinal motion of the drill within the arm. A large number of holes may thus be drilled in succession in the same surface, without moving the work; an advantage which will commend itself to machinists. It is especially useful in fitting up such work as steam cylinders, heads, and steam chests, which, by its means, can be drilled at one sitting instead of many, and has been approved and adopted, particularly in railroad and locomotive shops. The machine is provided with a horizontal table with screw and nut, for small work.

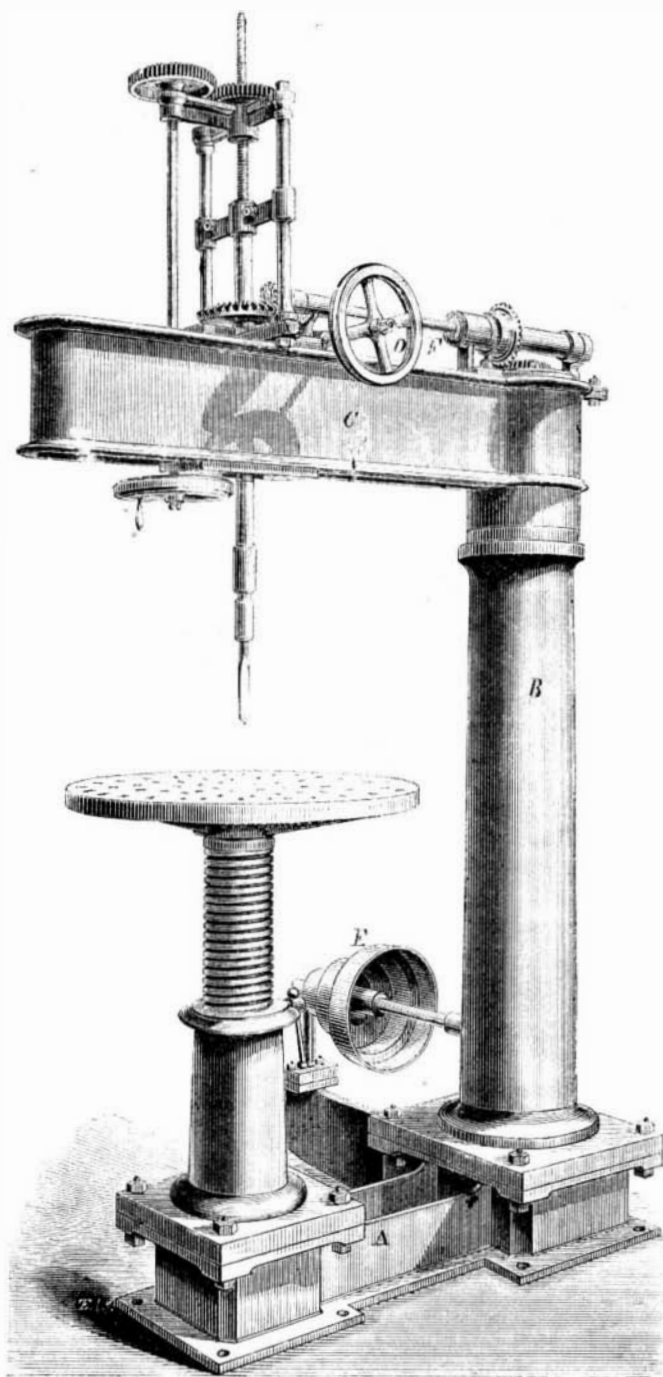
Manufactured by Robt. H. Barr & Co., machinists, Wilmington, Del., to whom all communications should be addressed.

The steamship *Glasgow*, of the Inman line, was recently burned at sea. No lives were lost.

## THE STORY OF THE MAN WHO FLEW.

The Chicago *Tribune* contains a letter from one Walter V. Collins, written at Minneapolis, Minnesota, giving an account of a modern Icarus, who flew by means of bladders, copper cylinders, parachutes, and

him ready to start. At the door there stood two teams and wagons, one of which contained what I supposed to be a canvas tent, with poles, etc. In the other we took our seats. The party consisted of Mr. Smith and his clerk, James McLennan, Capt. Cobb and myself, Patrick Riley and Andrew Ward, the drivers; six in all. Mr. Smith was enveloped in a large linen duster, which quite concealed his person. During the ride he appeared rather serious and taciturn. In two hours we reached a point about twelve miles west of the city, and there stopped. The country was a rolling prairie, wholly uncultivated, and with no traveled road for several miles on either side. The canvas, etc., was taken out and spread upon the ground, and I found to my amazement that instead of a tent it was an immense kite, made of sail cloth, with a strong jointed frame. It was of the kind known as the 'house kite,' hexagon form, and when put together was twenty-five feet in length, thus containing an area of over 500 square feet. Its cord was about the thickness of my little finger, but of great strength, having been manufactured to order. The tail of the kite was merely a light rope ladder. Mr. Smith now threw off his linen duster, and I could scarcely avoid laughing at his extraordinary appearance. Beneath his arm pits, and extending around his body, there was a copper cylinder, a foot wide from top to bottom, and about two feet in diameter. His ordinary clothing had been replaced by a tight-fitting suit of ribbed cloth, made apparently all in one piece. Attached to his arms and body were a pair of webbed wings of strong material with a light framework of steel. When at rest, these wings (if I may so call them) hung loosely about him like a closed umbrella, but when his arms were raised they became extended and gave him an odd resemblance to the 'Green Monster' in the pantomime. Scores of ordinary bladders were fastened to the suit above-mentioned, and equally in every part. Some were placed close to the body, and others depended at various lengths, from one to three feet. From the mouth of each a hollow, flexible tube communicated with the cylinder. These, it extended, would consequently form a net-work of air tubes. I made these observations hastily, for Mr. Smith at this time, assisted by the rope ladder, had just set up on a slight elevation, should be raised. The Captain and myself called out together



BARR & CO'S RADIAL DRILL PRESS.

kites with rope ladder tails. We print the portion of this letter which describes Mr. Smith, the flying man, and his apparatus, merely remarking with all deference to the names of the respectable citizens appended as witnesses to the feat, that the narrative has a very aerial sound.

"This morning at 11 o'clock, the hour appointed, we were promptly at Mr. Smith's store, and found

that he had forgotten his parachute; but he replied impatiently that he did not need it. We declared, however, that we would not permit so foolhardy an experiment unless this precaution were taken, and after a little parley he consented. A steady breeze was now blowing from the southeast. Riley and Ward took their place in the wagon beside the coil of rope; McLennan acted as driver while

Capt. Cobb and I remained on the ground as spectators. The horses were started into a gallop, and the kite rose, slowly and heavily, but steadily upwards. I glanced at my watch; it was twenty minutes past two o'clock. The kite continued to rise, with a slight swaying motion, higher and higher. It seemed as though the daring aeronaut must become sick and dizzy at his lofty height. Suddenly I was startled by an exclamation from my companion, and noticed a dark object falling from the kite and fluttering slowly downwards. It was the parachute which Smith had thrown away! The persons in the wagon, which was now half a mile distant, did not seem to notice this occurrence. Obviously Smith's situation, if his invention should fail, had become one of appalling danger; since it is almost impossible to bring a kite to the ground without a violent and jerking lateral motion. It seemed equally perilous to stop or to proceed. Trembling with anxiety, we watched with straining eyes his fast-receding form. I had an excellent field glass, which gave me a perfect view of his every motion. And now we noted that both the bladders and the wings had begun to expand. Higher he rose, but we could detect in his attitude no sign of doubt or trepidation. The bladders soon became distended so as to almost hide the man from view. He had now reached an elevation, as near as I could judge, of 1,200 to 1,500 feet, or about a quarter of a mile. He now detached his arms from the ladder, his feet remaining upon it, and waved the wings upward and downward, as if to try them. For an instant he stood thus, and then, relinquishing all support, he sprang off into the empty air! For a moment my heart stood still. I held my breath, expecting to see him dashed to the earth. But he did not fall; he did not even seem to tend downwards. His wings played with great swiftness, and he floated in a horizontal position, with apparent ease. Again, I glanced at my watch. The hand pointed to twenty-seven minutes before three. The kite, deprived of its ballast, had sunk to the ground. Watching narrowly, it was evident that Mr. Smith was slowly moving forward. It appeared to me that the bladder slightly contracted and expanded alternately, as one's chest does in breathing. Of this I could not feel absolutely certain, since the appearance may have resulted from their fluttering motion; yet, the Captain's opinion coincided with my own. After a few minutes (which seemed like hours), we perceived that Mr. Smith had begun to descend. Very gradually this was accomplished, and exactly at a quarter before three he touched the ground. We ran toward him, and found that he was considerably exhausted. He responded cheerily, however, to our hearty congratulations. As the wagon had already returned, it did not take long to stow away the kite, etc., and we then returned to the city.

"I have thus given a plain and exact account of this most extraordinary occurrence. I will not offer any speculation, concerning the nature of Mr. Smith's invention, and in fact do not consider myself at liberty to do so. But, I am greatly mistaken if the name of David K. Smith is not soon familiar to the public as one of its greatest benefactors. Any one can satisfy himself as to his character and standing in this community, by inquiring of Hon. C. E. Vanderburgh, Judge of the District Court, or of almost any citizen of Minneapolis. Any person wishing to inquire further is at liberty to call upon me at my office, No. 26 Larmon Block; or a letter will reach me through the Chicago P. O., Box 6,026.

"WALTER V. COLLINS."

#### THE WATER POWER OF MINNESOTA.

The St. Paul Weekly Press has a long article upon the flourishing condition of manufactures in Minnesota, and gives interesting statistics of the value of some of the trade there carried on. We copy:—

##### THE WATER POWER.

In order to turn this vast power to practical use the St. Anthony Water Power Company was organized in 1855. This company is now composed principally of Eastern capitalists. In 1856, the Minneapolis Mill Company was organized. In 1857 and 1858 the company proceeded to build a dam twenty feet high, running from the shore out into the river four hundred feet, thence up the river twelve hundred

feet. Five hundred feet of the twelve hundred is a dry dam, the same height as the portion running out from shore, and the remainder is lower, allowing the water to pour over it. Besides this dam the company built a canal at the shore end, one hundred and fifty feet long, which largely increases the opportunity for erecting manufacturing establishments. Mills situated on the dam pay for the use of the water alone, while the owners of those on the canal buy the ground and lease the water power. One of the saw mills pays \$1,200; four pay \$900, and one \$600 per annum for the use of water. Next season the company intend to extend the canal five hundred feet beyond its present limit.

##### THE LUMBER TRADE.

The most important branch of trade is in lumber, a business in which an immense capital is already employed, and which, owing to the great demand for the article, is being rapidly increased.

##### WHERE THE LOGS COME FROM.

Ninety miles above the falls, on Rum river, and one hundred and fifty above on the Upper Mississippi, are the pineries, which afford an almost inexhaustible supply of logs. Here, in the winter, large gangs of men ply the ax vigorously, and by spring millions of feet are ready for the drives.

##### DRIVING.

As soon as the river opens in the spring, if the stage of water permits, the work of driving the logs down commences—a work which is far from agreeable and oftentimes dangerous. Few have any adequate conception of the expense and perplexity incident to the drives. For two months this season the log owners were compelled to pay men four dollars per day and board them, and the expense of bringing the logs to the mills has been at least two dollars for every thousand feet of lumber obtained.

All the logs on the Upper Mississippi, some ten million feet, have been brought down, but in the drives on Rum river there are still twenty-five million feet.

##### THE MINNEAPOLIS SAW-MILLS.

Having noted the progress of the logs from the forest to the boom above the city, we next turn our attention to the mills. Situated on the dam heretofore mentioned, extending from the shore into the river, stands a block of six saw-mills, 360 feet long by seventy feet wide, with three Ls, 32x40, the whole under a single roof. A visit to these mills will prove of interest to any one, as the scale on which business is done is unusually large.

##### SORTING THE LOGS.

All of the mill owners or lessees have peculiar marks, which are cut upon each log with an ax in the pineries. They then come down promiscuously to the St. Anthony boom, fully a mile above the mills, where they are sorted—those belonging to the Minneapolis mills being driven into the Minneapolis boom, and floated down to the mills. Directly in the rear of the building each mill owner has a pond, defined by floating timbers lashed together, and when the logs reach these ponds from the boom above they are again sorted and driven into the pond of their respective owners, from whence they are drawn up the slip by machinery into the mill.

##### A BUSY SCENE.

Entering the mills, the visitor cannot fail to be struck with the life and activity visible. As they are only separated by frame-work, a person can look through the whole length and see a great collection of men and machinery, all moving with the utmost regularity. It is, emphatically, the hive of industry, and the indolent man would blush to find himself a spectator of such a scene.

##### THE SAWS AND THEIR USES.

The greater portion of the work is done by gangs of saws, which, with a single run, will convert any but the largest logs into boards. A gang consists of from twenty to twenty-two saws, according to the size needed for the logs; and of the gangs there are two kinds, the *live* and the *pony* gang. The live gang is used principally for flooring, fencing and inch boards, and is rarely adjusted to make lumber of a different thickness.

The largest logs are taken to the double circular saw, one saw being located just above the other, in order to complete the work if the log is too large for the lower one, and in this way anything short of California trees will meet their doom in short order.

These saws are used in making timber, dimension stuff, etc., and also in preparing the log for the pony gang, either by slabbing it or cutting it into bolts. The pony gang differs from the live gang in that it is used to saw lumber of nearly every kind and thickness, the number of saws being frequently increased or decreased according to the thickness desired.

In connection with the gangs are three other saws (circular), one edger and two trimmers. As soon as the gang has passed through a log, the boards go to the edging table, where the edges are smoothed and they are made of the same width, from whence they pass to the trimming table, where each end is sawed off at the same time, making them exactly the same length.

##### POWER AND CAPACITY.

It requires 40-horse power to run a gang of saws and 10-horse power to drive the edger and trimmers which go with it. The length of time required to run the gang through a log varies of course with the size; but eight minutes is ample time to transform a two-foot log into boards, and in fifteen minutes after a log comes up the slip in the rear of the mill it passes out to the sluice in front, finished lumber, and glides away to the raft. In ten hours a gang of saws can turn out about twenty thousand feet, and the double circulars from ten to twelve thousand.

##### NUMBER OF SAWS, ETC.

Number of gangs (22 saws in each), 9; number double circular saws, 6; number shingle machines, 6; number lath do., 6. Cost of six mills, \$143,000; capacity six mills (24 hours), 430,000 feet; men employed, 300.

If these mills are run night and day, they can manufacture nearly half a million feet of lumber every twenty-four hours. Some of the mills are already running both night and day, all of them probably will be soon.

##### WHERE THE LUMBER GOES TO.

Three rafts have been sent from Minneapolis and two from St. Anthony this season; and five more are nearly ready. Some of these rafts go as far as Memphis. Three million feet have been sent to St. Louis, and taken thence by steamer to New Orleans. In Minneapolis, all the dealers have large yards in which there are immense stacks of lumber.

##### THE PRODUCT OF THE SEASON.

Though compelled to commence late in the season, the Minneapolis mills have sawed twelve million feet, and the St. Anthony mills six millions. It is estimated that on the Minneapolis side, thirty-eight millions, and on the St. Anthony side, nineteen millions more will be sawed before the close of the season. This will make the entire product of this season, seventy-five million feet.

##### PRICE OF LUMBER.

The following is the present price list of lumber at the mills:—

Common lumber and fencing per M.	\$16 00
1st Siding .....	22 60
2d Siding .....	20 00
No. 1 Shingles .....	2 50
X Shingles .....	4 00
XX Shingles .....	5 00
Flooring, dressed .....	30 00
Flooring, rough .....	28 00
Dimension Stuff .....	16 to 20 00
No. 1 clear .....	30 to 35 00
No. 2 clear .....	20 to 25 00
No. 1 Pickets .....	20 50
No. 2 Pickets .....	15 00
Laths .....	2 75

This shows a large reduction, as for the past two years common lumber has been \$22 per thousand, and superior lumber correspondingly high.

##### WHAT KEEPS UP THE PRICE.

Those who anticipate any material reduction in the price of lumber this season will undoubtedly be disappointed. The great demand, a wide market and high price of labor, all tend to render it impossible to supply it at a lower figure. Having been without logs for two years, the home stock of lumber became so reduced that the demand in our own State is immense; and add to this the close of the war, which makes a market extending from the Falls of St. Anthony to the Gulf, and the result may be imagined. The expenses are also enormous. During the winter, the men received from \$40 to \$50 a month and board, for working in the pineries; and for driving the logs, owners are, and have been, paying four dollars per day. Where driving formerly cost fifty cents per thousand, it now costs two dollars. Wages at the mills, at the present time, range from two to four