

SCIENTIFIC AMERICAN

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

Vol. XXXVI. -- No. 17.
[NEW SERIES.]

NEW YORK, APRIL 28, 1877.

[\$3.20 per Annum.
[POSTAGE PREPAID.]

IMPROVED GAP LATHE.

We illustrate herewith a new and excellent lathe, which, from the fact that it is claimed to perform all the work usually done on several lathes of different sizes, will commend itself to the careful attention of all who require from their machine tools a wide range of capabilities, for reasons of economy both in space occupied and in first cost. The machine is a 30-inch swing lathe (ordinary measurement). It is 21 inches over the rest, and 10 feet 6 inches between centers, or 21 feet, if a shaft of not over 4 inches in diameter is passed through the spindle. By the use of the gap, a piece of work 48 inches in diameter and 26 inches in length may be turned; and by the face plate on the back end of the spindle, a wheel 9 feet or more in diameter can be bored. The boring bar is passed through the spindle, and is supported by a bush at one end, the other extremity being, as usual, carried to the rest. The speed of the lathe, with the countershaft running at 116 revolutions, varies from 290 to 7 revolution per minute. Between these limits are included the proper speeds for turning anything that will swing in the gap. The machine is also screw-cutting, and has a change-

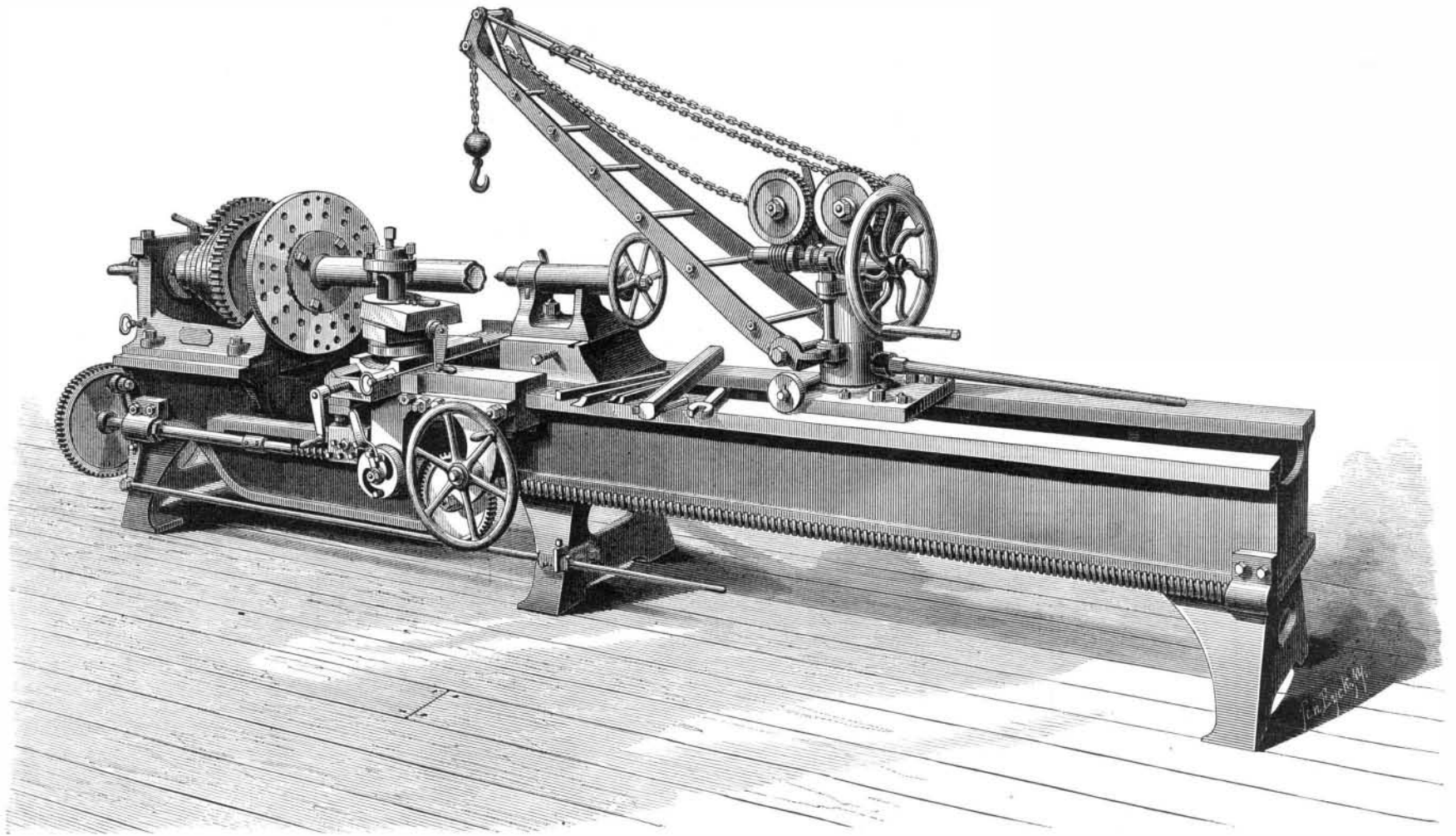
minute; but there are very few engines made which will not do much more than this for each nominal horse power. By this rule, a 10-horse engine ought to lift 320,000 lbs. 1 foot high each minute. Now some makers will give you an engine that will do more than double that work; while others will give you an engine that will only just do 320,000 lbs. and no more. No farmer, then, should buy an engine by its nominal horse power; he should ask some other questions, and get written guarantees from the maker as to what the engine really is. For instance, another of Watt's rules was that 1 cubic foot of water boiled off in an hour was equal to 1 horse power. Another rule to measure an engine by is the boiler surface exposed to the action of the fire, it being the custom nowadays to allow about 20 feet of boiler surface to each nominal horse power, that is to say, a 10 horse engine would expose about 200 square feet of surface to the action of the fire in the fire box and tubes, and of this from one fifth to one third would be in the fire box and the remainder in the tubes. If I were going to buy an engine, and wished to compare the prices of different makers, I would ask these questions: 1. Will you guarantee that all parts of

unable to tell the difference between a good and bad engine, would quickly disappear from the scene."

A Machine Dining Table.

A machine has been invented which may bring about a strike in a class of workers who rarely resort to such means of intimidation with objects other than securing more "nights out" or permission to entertain more admirers in the kitchen. We mean the waiting maids, whose occupation the machine dining table aims to destroy. The inventor says that it "is so constructed as to enable each person sitting at the table to bring the various dishes within his reach, which will enable the plates to be changed by mechanical means, allow each person to help himself to water when desired, which will keep bottles of wine and other substances cool, and which"—and here is luxury which reminds one of those frightfully expensive old Roman banquets—"shall be provided with a fountain to keep the air cool and refreshing."

We cannot pretend to describe all the mechanism. There is much of it. It looks destructive to children; but on the other hand it offers the advantage of a useful object for con-



WATSON'S GAP LATHE.

able cross feed of from 26 to 5 per inch. The rest is compound. The top rest will travel 12 inches, and the main rest the full length across the saddle. The tool post has three set screws, the center one for light and the others for heavy work. All three bear the strain directly through the center of the rest. The saddle is carried or supported over the gap by the lower ways, and on a level with the gap.

This lathe, we are informed, is as easily operated as any ordinary 30-inch lathe. The large face plate or gear is removable, so that, when the machine is employed for small work, its dead weight need not be carried. The trueness of the lathe, the inventor states, has been proved by turning a piece of work 4 feet in length clamped in the faceplate and not supported by the back center. This has been tried, and the work has been found, by caliper measurement, to be accurate.

For further particulars, address Mr. James Watson, No. 1608 South Front street (below Tasker), Philadelphia, Pa.

Agricultural Steam Engines.

"In buying or selling engines," says a writer in the *Agricultural Gazette*, "it is usual to speak of them as being so many horse power. Now this is a very loose term, and opens the door to a very great amount of humbug. A horse power, according to Watt, was 32,000 lbs., lifted 1 foot high each

the engine and boiler are calculated to work at the usual pressure of 120 lbs. on the square inch of the safety valve above the atmospheric pressure? 2. Will you guarantee that the boiler has 20 square feet of heating surface for each nominal horse power? 3. Will you guarantee that the boiler will boil off at least one cubic foot of water (6½ gallons) for each nominal horse power in the hour? 4. Will you give me two cylinders, and will you guarantee that each is arranged with separate cut-off valves, so that I can cut off the steam at any period of the stroke, and in such a way that I can alter the cut-off without stopping the engine, and say about 15 square inches of piston for each nominal horse power? 5. Will you give me a separate crank shaft for each cylinder, with a governor and a flywheel for each, and so arranged that I can work them either separately or both together, passing all the power through one flywheel if I wish? 6. If it were a traction engine, I would ask to have two speeds, one intended to use up all the steam (when expanding six times) at four miles per hour, and the other to use up all the steam at two miles per hour.

"If every farmer, before he bought an engine, asked all these questions and got a written reply to them, I venture to think that farmers' engines would very soon be greatly improved in quality, and that many makers, who at present exist as makers of engines solely because their customers are

temptation or topic of conversation for a dinner party of mechanical engineers. It might lead to disagreeable feeling among guests, if one should insist on revolving the middle portion, on which the dishes are placed, just as another was about to himself to some dainty morsel; and the stronger guests moreover would have an unfair advantage over the weaker ones, because they could forcibly adjust that rotating top so that the tidbits would come before their own plates. And when "the plates are to be changed, the crank, H¹, is turned, which lowers the plate that has been used, carries it in beneath the table top, and raises a clean plate through the opening." Supposing somebody should turn, accidentally, somebody else's crank, H¹, there would be another *casus belli*, for who could sit silently by and see his dinner sink, like the ghost in Hamlet, without feelings of resentment against some one, especially if hungry? There is a reservoir over the table and a system of waterworks under it, with a faucet for each plate. If something should leak, the unfortunate guests might in politeness sit still, while they contracted violent colds, owing to the soaking of their nether extremities. The invention is an ingenious one, but we fear it is not calculated to impress the precepts of the Golden Rule.

A good harness dressing may be made of neatsfoot oil 1 gallon and lampblack 4 ozs., stirred well together.