

# Economy Substitute

## FOR A BRIDGEPORT

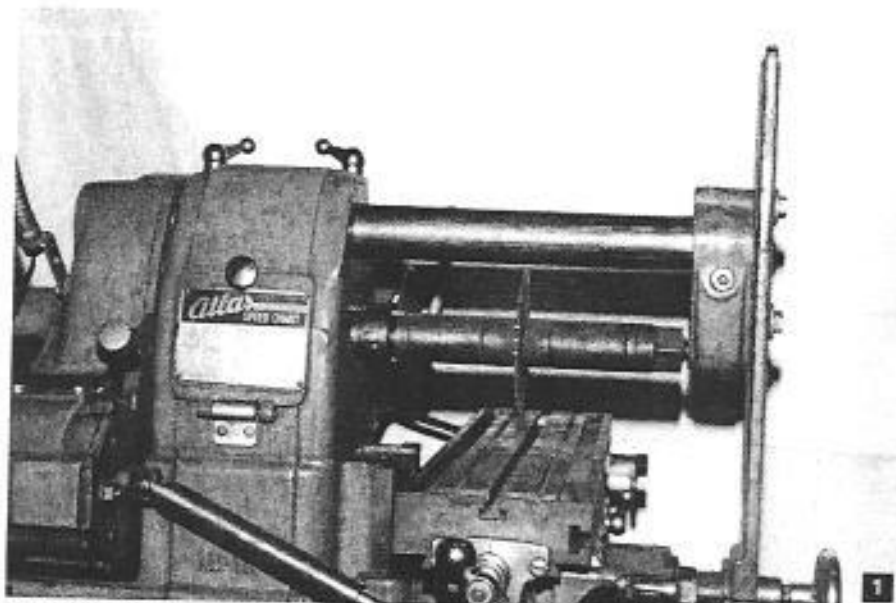
by John F. Ernest

**H**undreds of Atlas horizontal milling machines are collecting dust and rust in damp basements. Here are drawings and photos of a simple conversion to a vertical milling machine. No part of the standard machine is changed. Conversion from horizontal to vertical, or vice versa, takes only a few minutes.

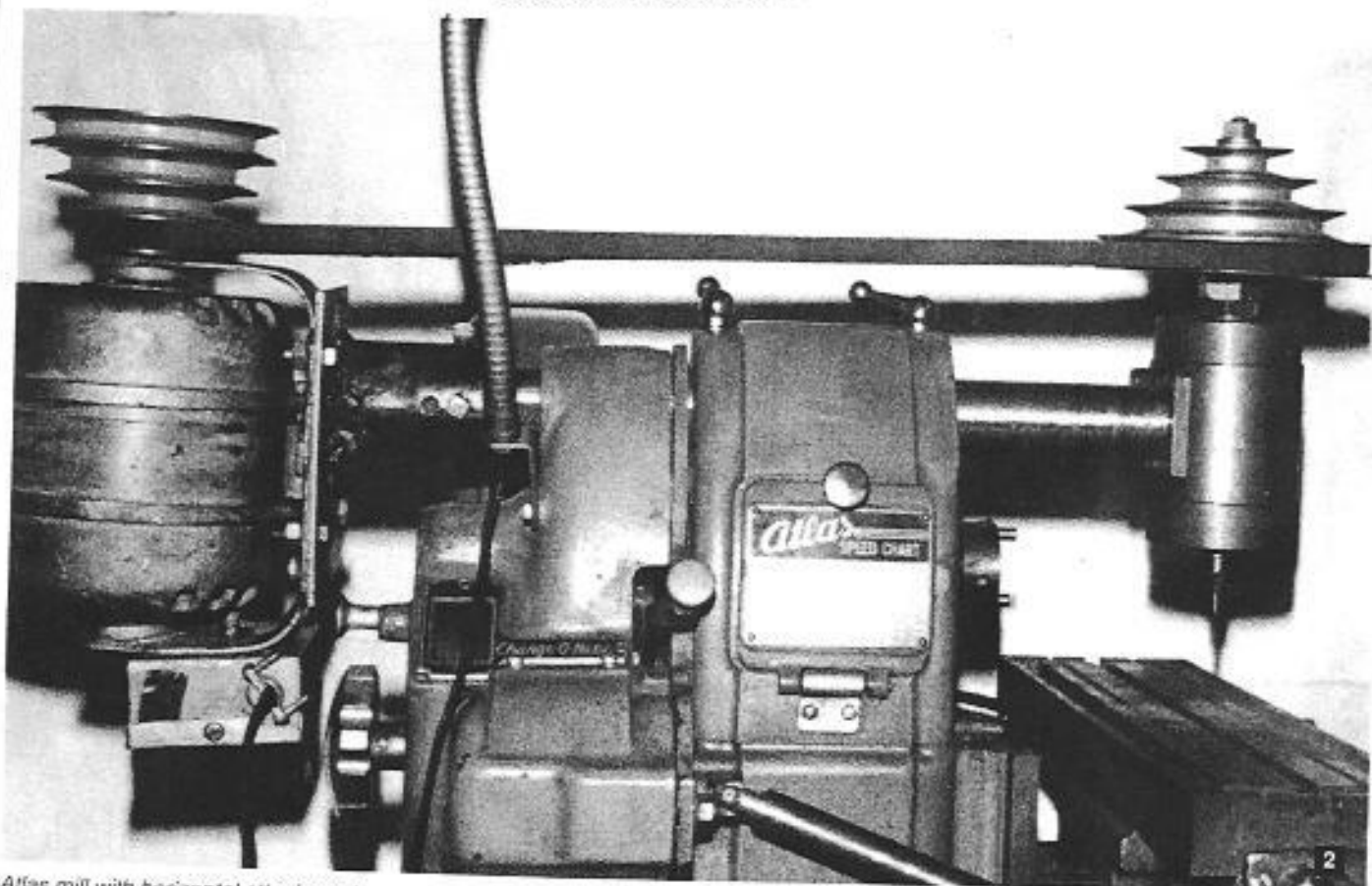
There is limited use for a horizontal mill in the average home shop. With a vertical spindle attachment, versatility is greatly increased.

To set the lathe cross slide to cut the Morse taper spindle, I mounted an old Morse taper reamer backwards in the chuck. With a dial indicator mounted on the compound, it was easy to zero in the correct angle.

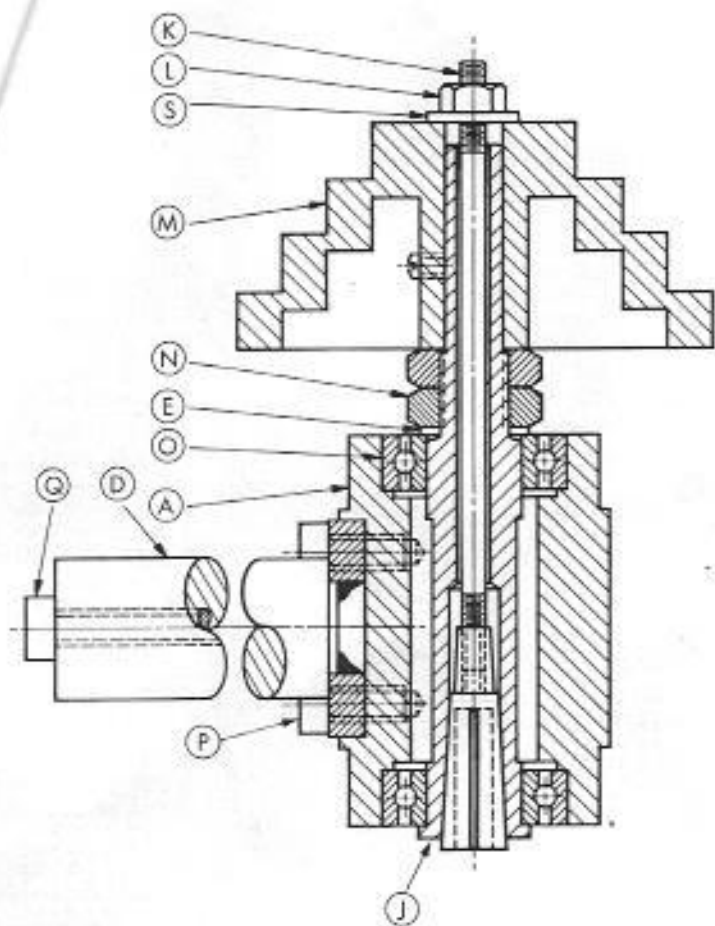
A guard is not shown, but should



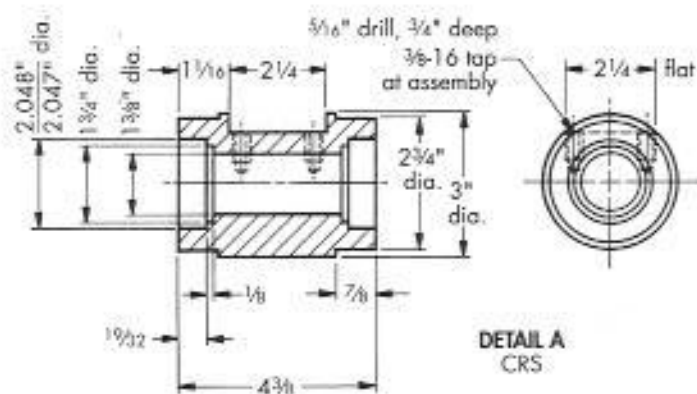
Standard Atlas horizontal mill.



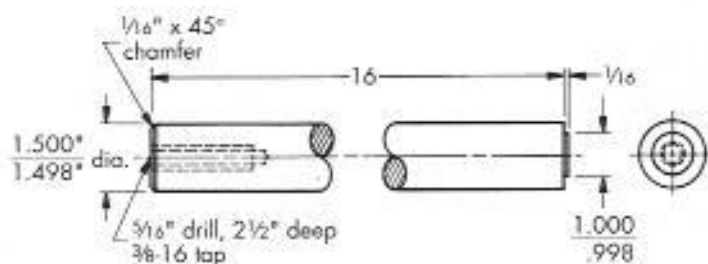
Atlas mill with horizontal attachment.



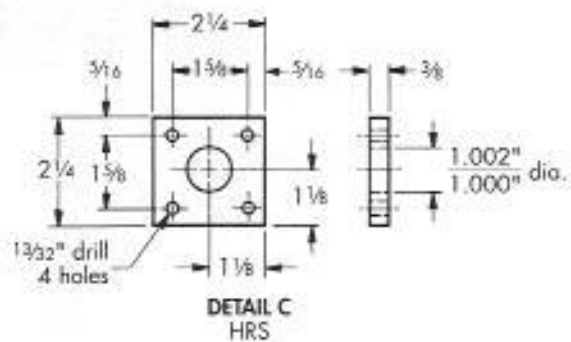
VERTICAL MILLING HEAD ASSEMBLY



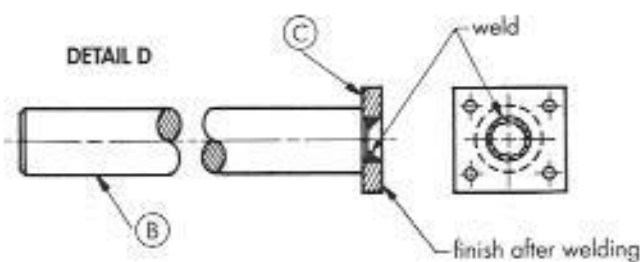
DETAIL A  
CRS



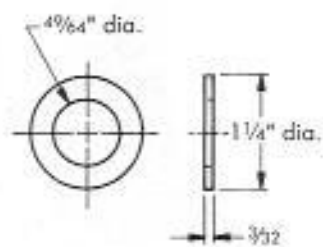
DETAIL B  
CRS



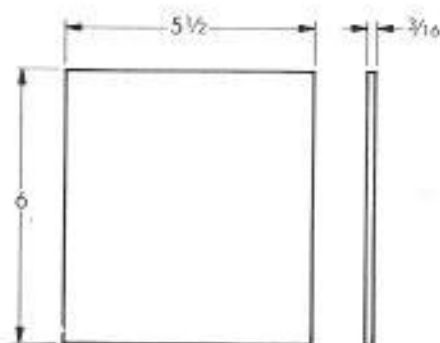
DETAIL C  
HRS



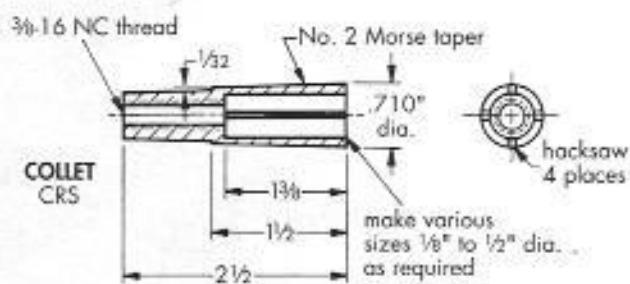
Parts removed are on the left; parts added are on the right.



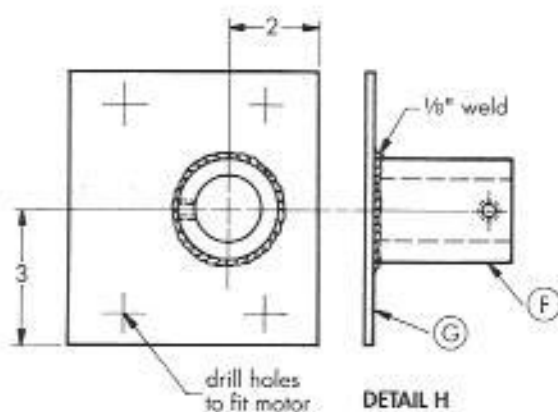
DETAIL E  
HRS



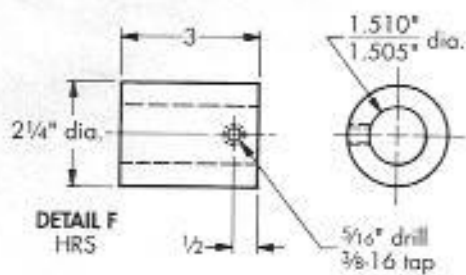
DETAIL G  
HRS



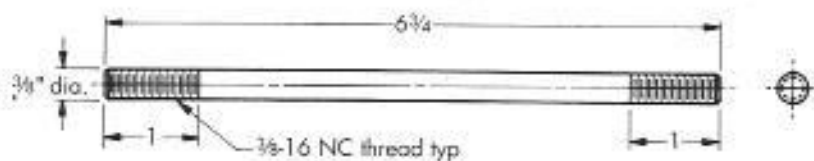
COLLET  
CRS



DETAIL H



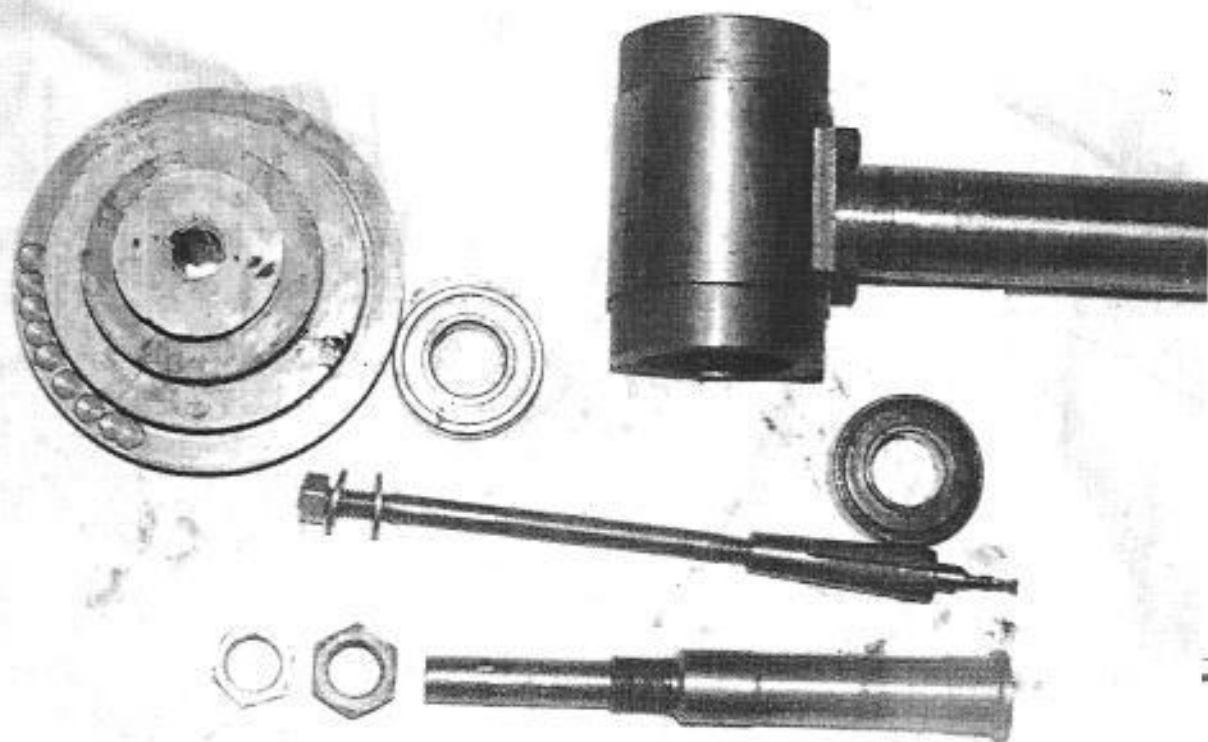
DETAIL F  
HRS

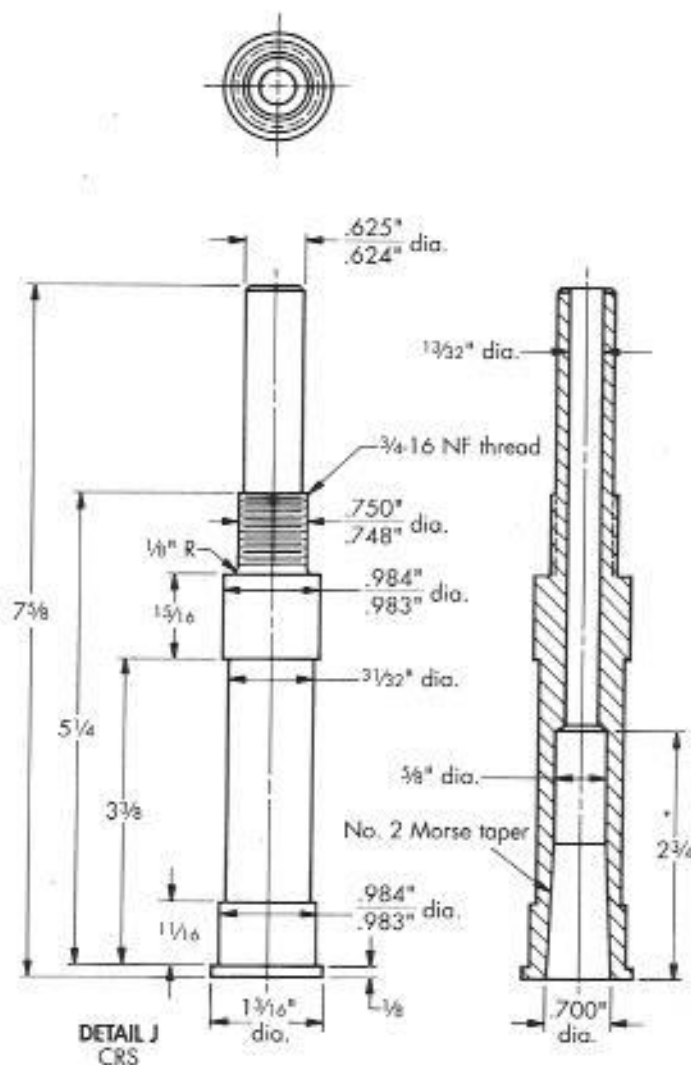
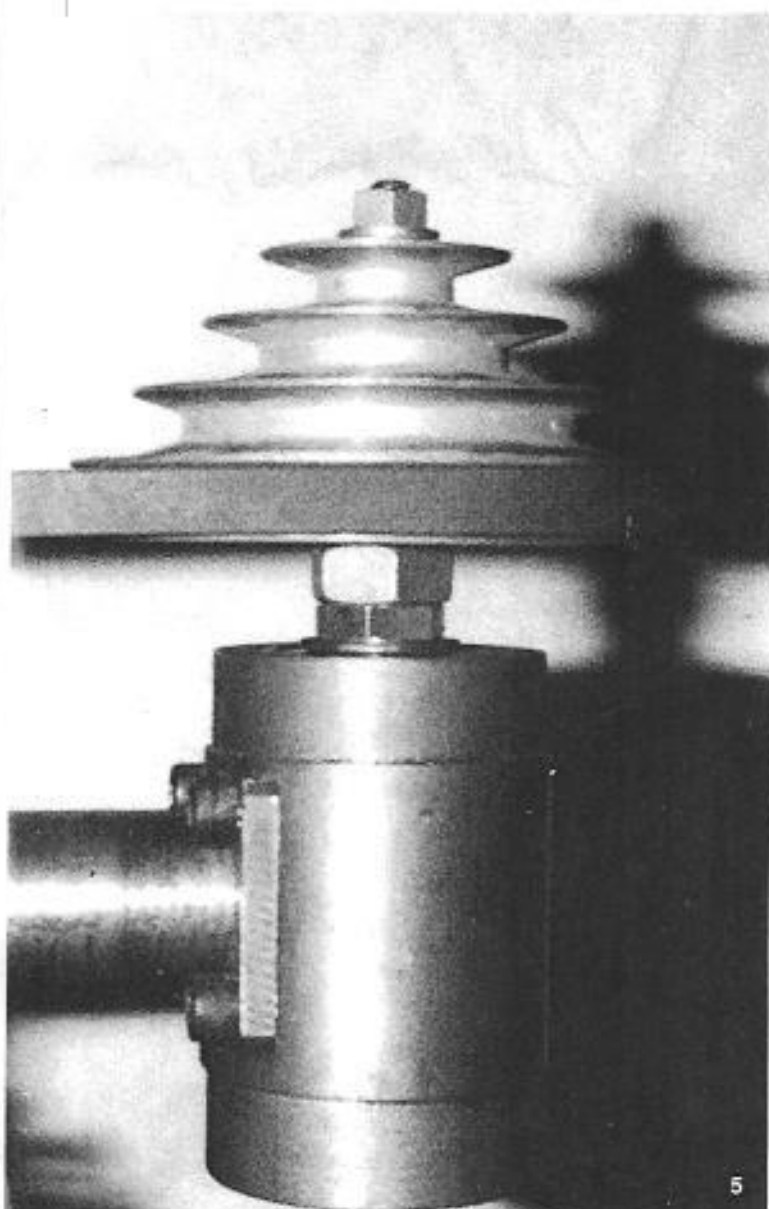


DETAIL K  
CRS

The head, before assembly.

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A close-up view of the head.

### BILL OF MATERIALS

Part	Qty.	Description	Size
L	1	Nut	$\frac{3}{8}-16$
M	2	V-pulley	4-step
N	2	Nut	$\frac{3}{4}-16$
O	2	Nut - jam	$\frac{3}{8}-16$
P	4	Allen screw	$\frac{3}{8}-16 \times \frac{3}{4}''$
Q	1	Allen screw - belt adj.	$\frac{3}{8}-16 \times 2\frac{1}{2}''$
R	1	V-belt	$\frac{1}{2} \times 52''$
S	1	Washer	$\frac{3}{8}$ Flat
T	4	Bolt - motor mount	$\frac{5}{16}-18 \times \frac{3}{4}''$
U	4	Nut - motor mount	$\frac{5}{16}-18$
V	4	Washer - motor mount	$\frac{5}{16}$ Flat
W	1	Setscrew - motor mount	$\frac{3}{8}-16 \times \frac{1}{2}''$
X	1	Motor, 1725 rpm	$\frac{1}{4}$ hp minimum

be provided. I made a functional guard from a coffee can for the front of the spindle pulley. It did not look too good, but worked. A guard should be made to completely enclose both V-pulleys and the V-belt.

A similar conversion was made several years ago for a Bunker mill, using the front hub and bearings from an International truck. The tapered roller bearings are probably more rigid, but sealing was more complex. The 205 KDD bearings were salvaged from a three-phase electric motor. "205" indicates the size, "K" means no filling slot, these giving more thrust and less radial capacity, because it has fewer balls. "DD" means double shielded (and permanently lubricated).

Photos by Author